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THE

# ANTHROPOLOGICAL REVIEW.

VOL. I.

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THE  
ANTHROPOLOGICAL REVIEW.

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MAY, 1863.

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INTRODUCTORY ADDRESS ON THE STUDY OF  
ANTHROPOLOGY,

DELIVERED BEFORE THE ANTHROPOLOGICAL SOCIETY OF LONDON,

*February 24th, 1863,*

By JAMES HUNT, Ph. D., F.S.A., F.R.S.L.,

FOREIGN ASSOCIATE OF THE ANTHROPOLOGICAL SOCIETY OF PARIS,  
PRESIDENT.

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GENTLEMEN,—I find myself placed in the honourable but somewhat difficult position of being the first speaker at a newly-formed scientific society. One thing, however, inspires me with confidence, the knowledge that my position has been caused more by my interest in the objects of the Society than by any special qualification for such a task. I shall therefore offer neither excuse nor apology for the matter I bring before you: but will simply beg all who hear me, to grant me that patience and sympathy to which, as your President, I feel myself to some extent entitled. We are met, then, this evening, to inaugurate a society of students of a great branch of science which, up to this time, has found no fit place for discussion in any other institution.

Without dwelling on the etymology\* of the title of our Society, it is still requisite that we should have some clear conception of the real import and breadth of the science which we unite specially to study and elucidate.

By some writers (especially by Dr. Latham), Anthropology has been so circumscribed in its meaning as to imply nothing more than the

\* "Anthropos, *man*, both as a generic term and of individuals, from Homer downwards; in plural of *whole nations, mankind, the whole world*.

"Anthropos, Lat. homo, being *man*, as opposed to *beast*.

"Anthropologos, speaking or treating of man. Aristotle, *Nicomachean Ethics*, 4, 3, 31."—LIDDELL & SCOTT.

relations of Man to the mammalia. If we were to accept this meaning of the term Anthropology, we should still have a vast and important field of investigation. I, for one, am prepared to accept this as our first great duty; and what a vast leap will science have made when those relations are fully established! I do not hesitate to assert that the question of the relation of Man to the mammalia lies at the very root, and must be the basis, of the development of the science of Man. What time has not been wasted in idle speculations, assumptions, and theories respecting the history of Man! What volumes have not been poured forth from the press on the origin of the human family! and yet at this moment Man's place in nature is a matter of grave dispute. What a strange position for science in the nineteenth century, to be found ignoring the connection of Man with the physical universe by which he is surrounded! And yet I think I may say with truth, that nearly all the writers respecting the problem of Man's past life have ignored his connection with the lower animals, simply because they have not been able to see the exact relation. But is it not perfectly useless to go on longer, thus looking at Man as a being disconnected from the whole chain of organic life? I will not waste time in showing that progressive knowledge of Man's history was impossible, so long as we were working in such a fundamentally erroneous system of investigation.

But I would not have it supposed that the science of Anthropology has any right to be confined to such limits. Anthropology is, on the contrary, the science of the whole nature of Man. With such a meaning it will include nearly the whole circle of sciences. Biology, anatomy, chemistry, natural philosophy, and physiology must all furnish the anthropologist with materials from which he may make his deductions. While Ethnology treats of the history or science of nations or races, we have to deal with the origin and development of humanity. So while Ethnography traces the position and arts of the different races of Man, it is our business to investigate the laws regulating the distribution of mankind

These are more or less philosophic questions, and the public may be disposed to ask us, in this matter-of-fact age, what practical bearing our investigation can have on human welfare. To such an inquiry I would most unhesitatingly reply that, not only must we look to the anthropologist for all the reliable accounts we can ever have of Man's origin or early history, but that there is no science which is destined to confer more practical good on humanity at large than the one which specially investigates the laws regulating our physical nature. We

shall not stop when we have discussed the mode of man's origin or his development into what he now is, but we shall go on to inquire what are the laws by which he is at present regulated. Why, for instance, a race of mankind is arrested in development, or perishes, in one region and in another flourishes? What can be more practical than showing the causes which deteriorate or destroy the races of Europe, when removed to some other regions? How many thousands of our soldiers' lives would be saved annually if we studied temperament in the selection of men suitable for hot and those for cold climates? But I must not dwell on particulars. Suffice it to say that in whatever way we look on the study of the science of man we see good reason to believe that, as students of human nature, we cannot be dreaming theorists, but that every truth we discover must be for the benefit of humanity at large.

Whatever may be the conclusion to which our scientific inquiries may lead us, we should always remember, that by whatever means the Negro, for instance, acquired his present physical, mental, and moral character, whether he has risen from an ape or descended from a perfect man, we still know that the Races of Europe have now much in their mental and moral nature which the races of Africa have not got. We have hitherto devoted our attention almost exclusively to physical Anthropology, which Blumenbach first founded. We now require to investigate the mental and moral characteristics of mankind generally. The difference between the European and the African is not so great physically as it is mentally and morally.\* We must, therefore, not neglect the psychological investigation, but must pursue it hand in hand with our physical investigations. Perhaps the psychological distinctions proceed from physical causes alone, but we shall be more likely to get light thrown on this difficult question if we conduct both investigations at the same time.

A serious charge has been made against the American School of Anthropology, when it is affirmed that their interest in keeping up

\* In making this assertion I would not be understood as joining in the vulgar error that the Negro only differs from the European in the colour of his skin and peculiar hair. On the contrary, the physical differences are neither few nor insignificant. From the researches of that accomplished anthropologist, M. Paul Broca, we now know that the white substance of the brain of the Negro is of a different colour to that of a European, and that the *pia mater* contains brown spots, which are never found in the European. There are many other physical differences which our minute researches will bring to light. Whether all these physical differences, with the consequent mental and moral distinctions, combined with the asserted fact that nowhere does there exist a permanent hybrid Euro African race, are of sufficient value to justify us in classifying the Negro as a distinct species, is a point on which, for the present, I hazard no positive opinion.

slavery induced the scientific men of that country to advocate a distinct origin for the African race. For myself, I believe such a charge to be a gross calumny. If it could be demonstrated that the Negro was descended from the ape only a few generations ago, it would not at all alter the fact that at present he is a man, and has enough in common with ourselves to make us know that his parentage can be no excuse for using him cruelly. Or supposing that the *Oran-ùtan* is, as the Dyaks believe, a degenerated species of man, it is equally certain that he is not now a *man*, and has not the same claims on our sympathy as the most degraded savage.

I would therefore express a hope that the objects of this Society will never be prostituted to such an object as the support of the slave-trade, with all its abuses; but at the same time we must not shrink from the candid avowal of what we believe to be the real place in nature, or in society, of the African or any other race. It will be the duty of conscientious anatomists carefully to record all deviations from the human standard of organization and analogy with inferior types, which are frequently manifested in the negro race. These observations should be made solely as to the existence of the facts themselves, and without any reference to the theories that may be founded on them. Future generations will thank us more for the establishment of good reliable facts than for any hap-hazard speculations. At the same time I would not say a word against the generalizer. In a society like ours we want thinkers as well as observers. We should give every encouragement to the accurate reasoner, as it is to him we must look for the laws which can be deduced from our illustrations and accumulation of facts.

I should have liked to have given this evening a sketch of the present state of Anthropology; but I shall only be able just to touch on some points which may throw light on the best means for its future development. In the first place, I think it will be well if we can fully realize the exact position in which we now stand, as we shall then be better able to appreciate the amount of work that is before us. I beg, however, that no one will interpret my opinions to be in any way the opinion of the Society generally.

As far, then, as I am able to judge, the science of Anthropology is not only in its infancy, but as a *science*, it hardly yet has any existence. Why we should have good reliable facts and systematic collections of the remains of all animals except man, is a psychological phenomenon of great interest, but one which I must not stay to investigate: but there can be little or no doubt of the fact itself. Dr. Morton in

America attempted to remedy this, and others have followed his example in this country, but what has really yet been done is comparatively useless for want of some general system and agreement between anthropologists. Without entering into the value of craniometry in elucidating some of the problems of man's physical nature, I would still insist that the facts are hardly yet at hand by which we can give any decided opinion on this point. During the last few years, much has been done, both in this country and on the continent, in illustrating the crania of different races; but no general system of measurement, based on some definite principle, has yet been successfully promulgated.

However valuable illustrations of crania may be, they are insignificant compared to the knowledge we derive from casts of the interior of the skull cavity. The importance of a collection of casts of the brain cavity of monkeys, anthropoid apes, and man, has induced Mr. Flower, of the Royal College of Surgeons, to undertake the duty of making such a series. Such a collection of casts will ere long bring about "the beginning of the end" of a very long controversy, which might be interminable without thus appealing to actual demonstration.

On such an occasion as the present, I think it will generally be admitted that we ought to consider the method which we should adopt in our investigation. The exact plan by which Anthropology should be studied has never yet been settled: but we must be all agreed on this point, or we shall fail to carry out the objects of the society. The great obstacle to the progress of Anthropology has been *a priori* assumption, not to say popular superstition. But if we are to make any progress with the science we are met to cultivate and develop, we must give up all such idle speculations as have been indulged in by nearly all ancient and modern writers on this subject. In the long-expected work "On the History of Human Folly," a most important chapter will be occupied in treating of the absurdity of the gratuitous assumptions and speculations on the origin of mankind. When we look back on the number of writers of learning and talent on the origin of humanity, it is perfectly wonderful to see the amount of ability which has been wasted, and all apparently from not investigating the subject by the only method that can lead us to any satisfactory result, viz., inductive and deductive reasoning. The metaphysician and others have attempted to prove the logical necessity of the unity of mankind. But is the origin of Man to be settled by the metaphysician? If so, *we* have nothing more to do. But what has been the result of such a state of things? Exactly what was to

be expected. While rapid progress has been made in every branch of science, the so-called "Science of Man" has remained exactly where Herder left it nearly one hundred years ago. It is evident, therefore, that as long as we continue to wildly speculate, no advance can be made, and we can never have a *science* of Man until we take the trouble to use a scientific method of investigation. We must, therefore, make up our minds to give up all assumptions and wild theories, and remember that the great problem of Anthropology can only be settled by *facts*, and not by abstract logic. It may be we shall have to wait for years before we shall get any true light as to the real origin of Man: but we must abide our time. We should always bear in mind that the man who believes nothing is nearer the truth than the one who believes in errors.

But judging from the researches that have been made during the last few years, there is some faint hope that we shall not have to wait long before a really rational theory of Man's origin can be advanced. The present time is most opportune for the formation of a society like ours. The question of the origin of Man which, owing to assumed vested interests, ignorance and superstition, had long been a forbidden subject of controversy, has now forced itself not only on the attention of men of science, but on that of the public generally. We have only to recall the episode of John Hunter and his "thousands of centuries," to see what a vast change has taken place during the last few years. Thanks to the geologist, we have *facts* to shew the existence of man at a period so remote that none dare assign even an approximative date. Indeed, in the present state of our knowledge, it were idle speculation to do so. The public mind is not accustomed to take sudden leaps, and we must, therefore, be content to wait for a time until the popular mind is prepared fully to understand the immense extent of time which the flint implements in the drift and other phenomena really indicate.

To show the absurdity of attempting to fix even an approximative date for the appearance of Man upon the earth, I quoted, in a paper read before the British Association at Oxford in 1860, the opinion of one of the most recent writers on the History of Mankind on this subject. Professor Waitz thinks to reconcile the hypothesis of the unity of origin of mankind (for which he is an advocate), that Man could not have been on the earth less than thirty-five thousand years, and that possibly he may have appeared as long ago as nine millions of years! Of course, such an opinion created a hearty laugh from those who were assembled in the divinity schools on that day. But Professor

Huxley has just asserted, "if any form of the doctrine of progressive development is correct, we must extend by long epochs the most liberal estimate that has yet been made of the antiquity of man."\* If any plea were wanting for founding this society, I would ask you to look at the different degrees of progress which the sciences of Geology and Anthropology have made during the last fifty years. While geologists have been dealing with demonstrated facts, most anthropologists have been idly speculating, and others employing themselves in the still less profitable task of attempting to show the identity of black and white by metaphysical subterfuges totally unworthy, not only of science, but of all serious consideration. Geology has within a few years become a great science, and the most ignorant or superstitious dare not assail her conclusions. But Anthropology has been totally stationary during this time. And why? Because the same *method* of inquiry has not been employed. We should, therefore, take a lesson from the geologist, and found a science on *facts*. This course seems so self-evident, that I ought to apologize for even mentioning such things, did I not know that one branch of Anthropology, *i.e.* the science of nations, or Ethnology, has been attempted frequently to be based on historical statements, etc., and we have had the "Natural History of Man" written before we had any reliable facts on which to found that history.

Besides this, we find that the ethnologists have encumbered their science with all sorts of terms which are based merely on vague historical data, and frequently on myths. The whole of the nomenclature of the ethnologists is full of terms, the use of which imply a theory. We must be careful to avoid, as far as possible, the error into which they have fallen. I would strongly urge the necessity of rigid care in the acceptance of historical statements as a basis for our own science. The only portions of history, ancient or modern, which are of any use at all, are the observations which were made by contemporary historians. But these statements even are generally too vague to be of any value for science. As we do not now accept the opinion of any one traveller as the basis of science, so must we be careful not to accept the authority of any one historian. All our facts, as far as possible, should admit of verification, but with the exception of some of the statements in history relative to astronomical science, these statements do not admit of verification; and we must, therefore, not look to the historian to throw any great light on our science. We must study Archæology as a science, and merely use history as a

\* *Man's Place in Nature*, 1863, p. 159.

commentary. Ethnology, as now understood, has quite outgrown the narrow basis on which it was started. We must, therefore, enlarge and deepen our foundations; collect a range of facts, and extend our sphere of observation, before we begin to fight some of the most popular ethnological questions of the day. Whatever might have been the value of Dr. Prichard's works in their generation, it is certain that is no little disgrace to our science that these works are still the text-books of the day. It is true, however, that neither in France nor Germany are the text-books on this subject of a much more satisfactory character. All systematic works have one fault in common; that they leave the great foundations of the science entirely based on conjecture, while they discuss subjects which are at present of little consequence, and only tend to produce party warfare. An attempt has been made to divide all ethnologists into two parties, monogenists and polygenists: and each party is supposed to be bound to support the side to which they may be espoused. Such a state of things is most unfortunate for science, and no progress can be made until we give up such fruitless skirmishing. If we take a glance at any of the great physical questions connected with Man, we find that nearly all is speculation—much, simple mythology. If we go to Borneo, we get the myth of the creation of man from the dust of the earth, and that woman was made from the great toe of the man; and the Thibetians believe that mankind descended from the ape.\* Both hypotheses are very imaginative, and perhaps have about the same amount of actual facts to support them. What we know is, that transformation of species has yet to be proved. No one (except Agassiz and his *confrères*) will deny the possibility of the descent of man from the ape by some unknown law of development: but the admission does not in the least give any countenance to such being at all proved by existing data. Oken's origin of man from the scum of the sea belongs to the same category of assumptions, and the speculations of Reichenbach† also require facts to support them. He says, "The soil in which the first man originated was an animal, and his first mother was an animal, and his first nourishment was the milk of an animal." Very likely this was so; but we shall want more evidence than this author gives us to accept such a statement for anything more than an hypothesis—supported by presumed analogy, but not by facts. We shall probably see what must have been the law of Man's origin long before we shall be able to

\* Link, *History of Mankind*.

† *Über die Entstehung des Menschen*.

demonstrate it. It will be our duty to test these hypotheses one against another—not by our own preconceived notions and theories, but by all the facts we can collect. We must always be ready to change our theories to suit our facts. As knowledge advances, it is absolutely necessary that the theories of every honest scientific man should change. True science cares nothing for theories, unless they accord with the facts. An hypothesis may be all very reasonable and beautiful, but unless it is supported by facts, we should always be prepared to give it up for one that is so supported; and as knowledge advances, so must the true scientific man change his theories. We should endeavour to be careful not to fancy we aid the cause of science when we absurdly give our support to theories that no longer can be reconciled with established facts. It will be a great misfortune to science, should students of nature ever become thus fondly wedded to their theories. Such conduct is to be expected from the ignorant, and consequently bigoted; but cannot be adopted by real seekers after truth. No doubt it is a weakness of our natures thus to cling to the theories of our youth; but we must be careful not to yield unreasonably to the charms of a first love. In our science, which, at present, is nearly all hypothesis, I think there is great need of this caution, and that we shall do well all to remember, that instead of having any cause of shame in giving up our unsupported theories, that it is something of which to be proud.

But having said so much, I ought, perhaps, to add, that it is the best plan to be very cautious in forming such positive theories, until we are warranted to do so by actual facts. We want speculation; but we must be careful always to make a rigid distinction between verified facts and speculation. It is the custom of the public to assert that a certain scientific man holds a certain opinion, theory, or hypothesis; but we must do all we can to let the thinking public know that such hypothesis is only held until we can get one that will more fully explain the facts. It is frequently asserted by scientific men on the Continent, that our cultivators of science are “priest-ridden,” and afraid to give utterance to their real scientific opinions. I will not stay to inquire into the amount of truth in the assertion, or to show that its general application is a gross calumny. I hope the members of this society will join with me in endeavouring to prove that many of our Continental friends entirely mistake our honesty in fancying that “the fear of public scandal,” (as they call it), in any way daunts the most free and open expression of honest opinion.

I have touched on the hypothetical views of Man's origin, and

would wish distinctly to state, that it is not only the unity of origin from a single pair that is a pure hypothesis, but that the somewhat popular view of the plurality of original pairs, or the creation of Man in Nations, (as Agassiz and many others hold,) rests on no better evidence than the hypothesis of unity of origin. It has been sometimes asserted that there is less difficulty in assuming the plurality of origin than to explain how all races could have descended from one pair: but science has nothing to do with what is the easiest explanation, we want to know what is the truth.

The accomplished and zealous President of the Ethnological Society, in one of his recent papers, writes, "that mankind consists of many originally created species, and that the hypothesis of unity of races is without foundation."\* Mr. Crawford might have added, I think, with equal truth, that the hypothesis of "many originally created species" is equally without foundation.

It has recently become so much the fashion to assert original difference to explain every phenomenon connected with Man, that it has been found necessary to continually increase the number of proto-plasts, until the last writer on the Classification of Man (Mr. Crawford), assumes upwards of forty distinct species. I think it well to quote the words of our great countryman, John Stuart Mill, on the subject. He goes so far as to say, "Of all the vulgar modes of escaping from the consideration of the effects of social and moral influences on the human mind, the most vulgar is that of attributing the diversities of conduct and character to inherent original natural differences."† All that can safely be asserted against the unity of the origin of mankind is, that there is no existing race or species which can be assumed to be the type of the original Man. The assumption of some ideal type of man from which all existing forms have arisen, is not based on any scientific data, and is merely speculation. It is a matter of uncertainty whether we shall ever be able to demonstrate by actual facts the *modus operandi* of Man's origin, but we may be able to ascertain the laws to which he owes his birth.

The remarks I have made respecting the necessity of having facts to support an hypothesis, find an apt illustration in that mythical and poetical subject—the *place* of Man's origin. There is not a continent, and hardly an island, which has not been asserted to be the birth-place of man. Not having facts to support any of these poetical dreams, we need not now concern ourselves with such a subject.

\* Transactions of Ethnological Society, vol. i, p. 2. New Series, 1861, p. 554.

† *Principles of Political Economy*, vol. i, p. 390.

We have some other questions that must be settled, before we come to the place of Man's origin; and in the meantime we may decline, as scientific students, to found any theory on mere tradition. Yet it is strange we should have a learned writer like Baron von Eckstein\* fixing the place of man's origin. Writing only in 1860, he says, "Everything points to the region of the sources of the Indus, Oxus, Jaxartes, and Serika rivers. There or nowhere is the cradle. This suits the historian, the politician, the geologist, the geographer." But does this spot suit the anthropologist? If we agree with the geologist, the baron's dogmatic assertions might be of some value. Those friends of fiction will be greatly interested in a work by Dr. Schulthess,† in which he believes to prove most conclusively that Africa was the original Paradise. Whether it was in the neighbourhood of the Gaboon he does not say. Equally powerful claimants there are for different parts of Asia and the island of Ceylon. It is evident, therefore, that tradition is not so positive as to the place of Man's origin as some imagine.

It is necessary to decide the scope and object of our Society. We look upon Anthropology as the Science of Mankind. We shall therefore treat of every thing that will throw light on the physical or psychological history of Man. It will be essentially our object to trace the primitive history of Man. But in doing this we require the aid of the geologist, archæologist, anatomist, physiologist, psychologist, and philologist. It is, therefore, nearly impossible in the present imperfect state of our science to be master of all these subjects. The time also has, perhaps, not yet come when the different sciences can all be brought to bear on the history of mankind. It is frequently asserted that we want more observation before we can generalize on this subject. But I doubt if this be so. We have abundance of observations and facts of a certain kind; but the observations are valueless, because nearly all travellers only see what suits their own preconceived notions. Facts, too, we have in abundance, but they are not of the right sort. For science we must have exact details; but this is what we have not got. It must be our object to decide what are the facts we most want, and collect information on a systematic plan. No country has during the last three hundred years published more works of travel than ours, and no people have had the same opportunity of studying the different races of man: but, unfor-

\* Baron von Eckstein in *Zeitschrift für Völker psychologie*; edited by Dr. Lazarus and Dr. Steinthal. Vol. i. part iv. 1860.

† *Das Paradies*. Zurich, 1816.

tunately, little of all these writings and observations are of any value to science. While men at home were dealing in assumptions, and performing the part of special pleaders for their own pet dogmas, we could not expect anything else from travellers. It must be our object to get travellers to give up all theories, and simply collect reliable facts. Another cause of the comparative uselessness of the accounts of travellers is the want of honesty in telling what they really saw. Some fear shocking public opinion, while others indulge in exaggerations for the sake of the excitement which their narrative produces in the reading public. Missionaries have had grand opportunities of studying the characteristics of uncultivated nations, but their narratives are proverbially useless to science by reason of the self-glorifying accounts of the results of their own labours. Some of the mildest people in the world have been called "cannibals" and "lowest savages," when there has not been a shadow of truth in the charge. But, generally speaking, travellers have not been to blame; the fault lies with the cultivators of science at home.

And here I must touch on a subject of deep importance. We have to found a great science, and we shall want labourers abroad as well as at home. These labourers to be of any real service to science must receive some preliminary training. They must have all nursery tales eradicated from their minds, and be taught to seek for facts and search for truth. The Anthropologist requires training, like the botanist, the zoologist, or the geologist. But this training can never be effected by a society like our own. Indeed such a scheme does not come within our object. It must, therefore, be done by the public. The Government must give to Anthropologists the same aid which it renders to the geologist. Surely it is not reasonable that we should care more for the extinct than for living forms of animal life. While it is the duty of Government to aid the study of the Anthropologist, it is also the duty of our Universities to make the Science of Mankind a special subject of study. I look forward to the day when all our Universities shall have professors whose sole study shall be the philosophy of mankind. In the political world the subject of "race" has been playing so prominent a part that the dullest legislator must begin to see that political institutions are not simply the result of the statesman's genius, but that there are higher laws in operation, to counteract which all his efforts are useless. It is true that in the present state of our science we can offer no positive dogmas to the politician; but we see enough to know that laws are secretly working for the development of some nations and the destruction of others; which it is both the province and the duty of the politician to assist in

discovering. We must go on working as best we can, and ere long the public will see that it is for their own interest, and for the benefit of humanity at large, that the scientific study of Man shall be made a part of national education.

While, however, State aid is certain to come in time, we must at present appeal to private enterprize to assist in carrying out what is, to a great extent, national work. And one of the best means of helping to do this is by the establishment of a good and reliable museum. In this country there is really no ethnographical museum which is at all worthy of the British nation. With better opportunities than any other people, our ethnographical museums are still very inferior and imperfect. It will be our duty not to care so much for collecting a museum of our own, as to assist in forming one that shall be worthy of the country. How this can best be carried out must always be a matter for earnest consideration. In the meantime this society will commence forming a museum; but I think we ought always to be ready to give up anything that will be for the benefit of the public or the cause of science.

But there are other duties which will demand our more immediate attention; and I will briefly touch on some of these, as it may serve to illustrate how we purpose to carry out the work we have undertaken.

Much of the future success of the Society will perhaps depend on the character of the papers read at our meetings. I suggest, therefore, that, as far as possible, it will be advisable, in the present confused state of our science, that we should give preference to such papers which have for their object the removal of some of these mysteries. To-night we will discuss whether we shall go on playing with the so-called science of man, or whether we shall be content to give up all dogmas, confess our ignorance as to knowing anything about the laws regulating man's origin or development, and be willing to begin *de novo*, only basing our opinions on actual demonstrable facts, and arguing solely from the logical inference from such *data*. If we decide on our method to-night, we can then go on to discuss at our next meeting the terms we agree to use. There is an absolute necessity we should endeavour to agree on this point, for science can make no advance, while hardly two persons use such an important word as "race" in the same sense. As a new science, which we hope to see popular, I trust that an endeavour will be made to render the terms we use as simple as possible. We had better spend the whole of this session in debating this subject, in order to come to some general agreement, than rush madly on to the discussion of

the subject, which we cannot argue with any profit, until we have settled the meaning we each attach to the terms we shall use in our warfare. Various subjects will be brought under consideration, and amongst others the question as to how far it would be advisable to make use of the terms of the phrenologists in our minute descriptions of the crania of races of man. We, of course, cannot accept any such dogmatic system as a basis of work; but we must see how far it will be advisable to adopt the nomenclature of the phrenologist for describing human crania. The *Manual of Ethnological Inquiry*, put forth by the British Association, has already recommended the expediency of using the terminology of the phrenologist, and such a recommendation has, some think, tended to retard the rapid progress of craniology. Phrenology, as a system, we cannot accept; but we are bound to inquire how far it is founded on true principles. I presume that we shall nearly all be disposed to admit fully that the form and quality of the brain in some way indicates the intellectual and moral character of the man; but we must not rush hurriedly and build up a system, or accept any system which is founded on this general admission. The phrenologists have hitherto paid too much attention to mere form, and not enough to quality, which is quite as important. Nor must we accept such a dogma as that propounded by Liebig, that the cerebral action must be proportionate to the mass of the brain. On the contrary, we must seek for a solution of many of the contradictions which surround this subject, in the minute histological anatomy, or in the chemical constituents of the brain of the different families of man and the lower animals. Schlossberger has already affirmed that there is less fat and more water in the brain of children than of adults. If we take this with the dogma of Moleschott, that "Without phosphorus there is no thought," we shall see the value of chemical and microscopical investigation on this subject. The exact relation which thought bears to some form, quantity, and quality of the brain, is as yet uncertain; all we now know is, that they are connected: but it is left for us to discover the exact relations.

It is not a little remarkable, that amongst all the journals devoted to different branches of science, there has as yet been no independent journal for the interchange of communications from anthropologists in different parts of the world. The advent of our Society will enable such a journal to be founded. This journal will, however, not be under the influence of the Society, further than engaging to print our official reports. It will be for the use of, and a medium of communication between all anthropologists. I need hardly say how valuable such a journal will be to us as a Society, and indeed for

science generally, if it is only conducted in that spirit of moderation, fairness, and freedom from all party or personal bias, which is at this time demanded.

In this Journal the reports of our meetings will be published quarterly; and it is hoped that by so doing there will be a constant and sustained interest taken in the works of the Society. Long memoirs will be only given in abstract in the journal, but they will be published at length at the discretion of the council, and delivered to the fellows in a separate publication.

In selecting works to be translated, we shall be guided by a desire to introduce books into this country, which, while being useful to the student and teacher, will at the same time help to give the reading public a better appreciation of the object and extent of anthropological science. The council will not simply favour the translations of works, in the opinions of which they agree, but will aim at introducing those works which best represent the prevailing opinions respecting Anthropology on the Continent. The importation of foreign ideas and modes of treating our science cannot fail to produce beneficial results.

Another important feature in our plan is the appointment of local secretaries in different parts of the world. It is well known that there are many who are anxious to render some assistance to science, but do not know what to do, as they are ignorant what sort of information science requires. If our local secretaries are carefully selected, and proper questions and instructions are sent to them, I look forward with much hope to the benefit that will accrue to science from such a plan. The council invite the Fellows of the Society to nominate any gentlemen for local secretaries whom they believe willing to render service to the society and to science.

Such, then, are a few of the most important self-imposed duties we have undertaken. I have heard it stated that there are societies now existing in the metropolis who do the same work. But such a statement is made in ignorance of what we intend to do. I do not hesitate to affirm that we propose to do work which is not even attempted by any existing society. Whether such existing societies could have been moulded to do the work we have undertaken is another matter. The question as to whether we have done well to found this society is one which cannot be answered at this time. We must be content to leave that to the future historian. We ask for judgment, not on the promises we make, but on the work we perform. Whatever be our future, I believe that the founders of this Society are fully sensible of the vast work they have undertaken, as well as of

its importance. They are fully conscious that to carry out their duty well, it is necessary to have a very considerable number of members. The first meeting of the friends of this society only took place about six weeks ago, and now we have 120 members. So far, therefore, all has gone well. More yet remains to be done; but the council trust that the members will make the society known amongst their friends. Support will be sure to come when it is seen that we really mean work; and in the meantime let all strive to gain the number of members by which we can work the society with effect and with benefit to the cause of truth and science.

It is true that some who were naturally thought to be interested in our work have not yet joined; but nearly, without exception, every one who has been asked to help us has admitted that, if we carry out our prospectus, we shall be supplying what is one of the great wants of the age. Nearly all have admitted the desirability of our plan; but some have contended that we should never gain support enough to carry out what we propose. By the prospectus it will be seen that we are essentially a publishing society. The translation of foreign works alone is an undertaking of immense importance in the present state of science. We shall endeavour to print works of such value that no public or private scientific library will be complete without them. What a vast *impetus* will these works, with a quarterly journal, give to the study of Anthropology! Whether this be so or not, our reward will be that we give to the public an opportunity of studying Anthropology, which they have never yet had. The more support we gain the greater will be the success of our labours.

I know only of one serious objection (if such it can be called) which has been made to our work, and it is "That the time has not yet come for the formation of such a society; and that we should wait until the public mind was ready to take more interest in what we do." But are scientific men to wait for the public to take an interest, before they begin to clear away the misty traditions in which their science is enveloped? Are scientific men to wait patiently until antiquated prejudice is removed, by some supernatural agency, from the public mind, before they begin to study questions which are of interest, not to the few initiated, but to the whole civilized and indeed uncivilized world? No! it is our duty to clear away the encumbrances with which dogmatism and ignorance have enveloped the study of Man, and we must show the public that the origin of Man is a question of physical science which can have no light thrown on it by authority or tradition.

We shall then have to go on to show that the attempt to discuss

at present the unity or plurality of origin for mankind is really nothing better than child's play. We shall always remember that even unity of species does not necessarily include unity of origin; and that with plurality of existing species, the *possibility* of the unity of origin cannot be denied. It has been stated that the promoters of this Society were composed of "advanced liberal ethnologists." Such a statement I believe to be entirely an error. I presume the "advanced" ethnologists must be those who can discuss the unity or plurality of man, and those who can write learned papers and take part in minute discussions on the classification of man! These are the advanced ethnologists, who are certainly discussing questions very much in advance of myself or my associates.

For years past there have been public discussions going on as to the unity of man's origin. As matters now stand, this discussion is simply arguing in a circle. It cannot yet be fairly discussed on scientific grounds at all. Before any scientific discussion can be held we must know far more of the laws regulating the intermixture of the different races of man. What we know on the subject is as yet hardly worth calling science. M. Broca, the accomplished secretary to our sister society in Paris, has stated the known facts; but the question is still in a most unsettled and unsatisfactory state.

Many intelligent persons now believe that Ethnology merely attempts to solve the question whether there was unity of origin for the different races of man. We shall therefore do well to make it known that (for the present) Anthropology is not in a condition to give any answer to that question. There are a host of subjects which have to be decided before we are in a position to give even an approximative answer to the question of the unity of mankind. The unity of mankind is an article of faith with many estimable persons, whose opinions deserve respect, and therefore, as such, we dare not, and ought not, to discuss it. We can only discuss it as a scientific hypothesis, and as President of this Society it will be my duty not to allow this dogma to be attacked or defended, except as a scientific hypothesis. I shall apply the same check to any other article of faith, and not allow it (as such) to be discussed in this society. The theologian (as such) has no right to interfere with the conclusions of physical science; and the man of science (as such) can know nothing of matters of faith. It must, therefore, be distinctly understood that we are formed into a society for the strict investigation of the science of Man, and that we must have the most perfect freedom of action and expression in all our discussions; not a mere

spurious professed liberty of thought, but something real. As scientific men, we must not be ashamed to own our ignorance, and say—

“ All we know, is,  
Nothing ‘yet is’ known”—

either respecting the origin of mankind or most of the important laws by which humanity is now governed.

There are many other points on which I ought to dwell, and amongst others, how we can best carry out our objects at the British Association. I trust I shall offend no member of the Royal Geographical Society when I say that it is utterly impossible for the science of Man to make any progress while it only takes a second and subordinate place in Section E. I believe I shall be supported by all who know the working of the British Association, when I say that the position Ethnology holds there is most painful to all those who are any way conscious of how that subject should be studied.

It will be for the Society to consider this matter, and the promoters of the British Association—always anxious to do all they can for the advancement of science—will, I am sure, be ready to adopt any plan which they think would be better for science than the present. Anthropology may be compared to the last volume of a work on Zoology, with perhaps an appendix. No doubt, therefore, the proper place for Anthropology is either in section D, or in a sub-section immediately connected with students of the other branches of animal life. Ethnology was formerly a sub-section of the zoological department, and what *scientific* consideration induced the government of the Association to remove it from its natural place, I have never been able to discover.

In drawing these hurried remarks to a conclusion, I would wish strongly to impress on my fellow-labourers that we have undertaken a most solemn and responsible duty. The time has gone by when the questions we are going to discuss could be evaded. Thanks to the spread of thought and liberty, the public demand that all subjects connected with Man shall be freely and openly discussed. They begin to realize the fact that there is nothing to fear from truth. The cry of “ Danger ” may be raised, but the public will no longer respond to it. They have heard it so often, that it produces no effect. Astronomy and geology have each been assailed as they have dared to expound the truths of nature. Some faint outcries have been heard at the discussions of the ethnologist, but their denunciations have never had a scientific value; and the time is yet to come when some mad attack may be made. It is said “ that a burnt child dreads the fire, ” but it remains to be proved whether some men will ever learn from experience. Whatever may happen, we must go on manfully with

our work, and neither turn to the right nor the left, to notice the odium which ignorance, fanaticism, or jealousy may cast at us. Public opinion has become so much altered that I do not anticipate such a result. On our part, we must be careful never to attack the religious conviction of any one. We have no right to attack or give any opinion on religious or theological subjects. Our duty is simply to seek for truth by patiently collecting data, and then carefully and humbly endeavour to decipher the meaning and import of those facts. I have heard it remarked that all recent discussions respecting Man have been mingled with levity; which should certainly not be introduced into any scientific discussion. We must be careful to avoid this. What we now want are earnest and real lovers of truth. Astronomy and Geology both have their wonders, but Anthropology has wonders equally great to reveal. We have had the enthusiastic astronomer and geologist, and are we never to have any earnestness in the study of mankind?

Let us, then, show that we too can be earnest in our study, as well as the geologists or the astronomers. But let it be known we are as yet only groping in the dark, and know not yet what to study, or hardly what facts we want to get, to found our science. We have not only to found a science of Anthropology, but we have to do what we can to form some anthropologists. We must not be daunted, but remember that our work has received the best wishes from many a scientific veteran, and deep regrets that they are unable to aid us. The work of this society must depend on young men who are ready to make it their study. Our success so far is all that can be desired. Thanks to a united council of workers and to our zealous and brave honorary secretary, we have within a few weeks founded a society, and commenced work in earnest. With such officers and such a council, I am content to be the humble steerer of our vessel, knowing that my course is already settled in our prospectus. This will be my sole guide and the path I am bound to follow. We have faith in the thinking public, and know that we shall be supported as long as we keep faith with them.

Let us remember, too, that science is not advanced by mere numbers. If we meet here as scientific brethren, and discuss the questions before us calmly and earnestly, as men ought always to discuss—whatever our numbers may be—we shall make more real progress in scientific discovery than by holding huge meetings where passion and ignorance drown both reason and common sense. Let us, too, not be daunted when we see our sister society, in Paris, surpassing us in papers and discussions. We must remember that they have a large band of trained men of science, whose sole duty is the investi-

gation of the problems which we attempt to solve; and that they possess some advantages which are not yet within our reach.

In conclusion, let me quote the words of a man whose death was such a great national loss. These sentiments, I think, are most appropriate to the present occasion, and coming as they do from the large hearted Edward Forbes, they must command the attention, if not obedience, of us all. He beautifully says,\*

“The highest aim of man is the discovery of Truth; the search after Truth is his noblest occupation. It is more; it is his duty. Every step onwards we take in science and learning tells us how nearly all sciences are connected. There is a deep philosophy in that connection yet undeveloped; a philosophy of the utmost moment to man; let us seek it out. The world in which we live is a beautiful world, and the spirit of Omnipotence has given us many pleasures and blessings, shall we not enjoy them? Let us refresh ourselves with them thankfully, whilst we go forth in our search after Truth. We are all brethren, but it has pleased God variously to endow our minds. Some delight in one thing, some another. Some work for the good of the Body, and some for the good of the Soul. Let us all work together in fellowship for our mutual happiness and joy. Wherefore should men quarrel one with another because they hold different doctrines? Such as seek for Truth in the right spirit sympathise with each other, and, however opposite may be their present opinions, revile them not, but assist in their development; knowing, however wide apart may seem the paths they have chosen, one goal is aimed at; and if persevering, both must meet in the one wished for temple. Let those who feel the spirit to develop the Wisdom of Creation, and to act for the good of their fellow-men, strong within them, unite together in a bond of fellowship, each brother devoting his time and his energies to the department for which he feels and proves himself best fitted, communicating his knowledge to all, so that all may benefit thereby, casting away selfishness, and enforcing precepts of love. By such means glory shall accrue to his order, so that it may wax powerful in intellectual strength, and become a mental and a moral safeguard to the world, and a bond of union among all nations.”

Thanking you for your kind attention, I will only add, may such sentiments always animate the Fellows of the Anthropological Society of London.

\* *Life of Edward Forbes.* 1861. P. 195.

## WILD MEN AND BEAST-CHILDREN.

By E. BURNET TYLOR, FOR. SEC. A.S.L.

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THE native Australian and the Andaman Islander may be taken as fairly representing the lowest state of human society of which we have any certain knowledge. To a civilized European, such a life as that of these tribes seems, at first sight, but little removed from that of the lower animals; but a closer examination shows that, though their civilization is indeed very low in degree, it is the same in kind as that of more advanced races. These savages have articulate language; they know the use of fire; they have tools, though but simple and clumsy ones. There is no authentic account of any people having been discovered who did not possess language, tools, and fire.

But though at least this amount of civilization is always present among men living in communities, there are lower conditions under which it is possible for man to live, at any rate for a time. It is an object of some importance to anthropologists to know where the lowest limit of human existence lies; but, unfortunately, this limit is difficult, if not impossible, to find. Stories both old and new have been told of man living as a beast among beasts, or in a state of degradation not far removed from this; but they are few in number, and most of them are worth little or nothing as a proof of actual fact, though they are of great interest to the student of mythology. I have arranged and sifted, to the best of my ability, the stories of this kind which I have met with, beginning with some which are certainly true, and ending with others which are as certainly fabulous. Somewhere in the debatable land between the two, the line which separates fact from fable must lie.

After Napoleon's German wars, the countries ravaged by his armies fell into a state of misery and demoralization which we, whose lives have been spent in peace and prosperity, can hardly form an idea of. During this period, children without parents or friends, and left utterly destitute and uncared for, were quite common in Germany. Several such children were taken in at Count von der Recke's asylum at Overdyke; among whom were two especially, whose cases are noteworthy, as showing in what a state of degradation human beings might be found living in civilized Europe, not half a century ago.

One day a boy was sent to the asylum ragged and bleeding. He could not tell his name, so, as it was St. Clement's Day, they named him Clemens. When they asked him where he came from, he said "from the other side of the water"; but his answers to other questions were mostly unintelligible. When his mind had been somewhat developed, he told what little he knew of his own history. He had been set to keep swine, and shut up with them at night. The peasant, his master, gave him scarcely food enough to sustain life; and he used to suck the milch sow, and eat herbage with the pigs. When he first came to Overdyke they had to keep him out of the salad-beds, as though he had been a pig himself; for he would go on all fours in the garden, and seize and eat the vegetables with his projecting teeth. He never lost his affection for pigs; and they were so tame with him, that they would let him ride about on their backs. His pleasantest recollections and his favourite stories were about his life with them in his childhood.

This boy was not actually an idiot, as his history shows; but he was probably of imperfect powers of mind from his birth. He is described as having a very narrow head, and low forehead. His eyes were heavy, and he could not be made to run quickly or walk in an orderly way, though he was not deformed. He was always inclined to laugh, was of a joyous disposition, insinuating, and sensible to kindness. But, on the other hand, he was subject to uncontrollable fits of passion; and once, on being reprov'd for uttering frightful curses (a habit which he had learnt in former times), he tried to murder his benefactor with the woodcutter's axe he had in his hand, and laughed heartily as he was being taken away to be put in confinement.

Another boy, who was taken into the same asylum, had learnt to live almost wild in the forest, only approaching villages for the purpose of stealing food. He climbed trees with wonderful agility to get eggs and birds, which he devoured raw; a habit of which he was never cured. This boy's knowledge of birds and their habits was extraordinary; and the published account of him states that he had given "to every bird a distinctive, and often very appropriate name of his own, which they appeared to recognise as he whistled after them." This means, I suppose, that he named each bird by imitating its cry.\*

The picture of Germany after the French invasion forms an apt

\* Some account of these cases is given in *Dusselthal Abbey*. London: Nisbet, 1837. Details not mentioned there are from a MS. account sent to me by Count v. d. Recke.

parallel to the picture of Italy during the invasion of the Goths, in which the historian Procopius tells, as a startling instance of the horrors of the war, a story which belongs to the category before us, and is very likely true as matter of fact. An infant, left by its mother, was found by a she-goat which suckled and took care of it. When the survivors came back to their deserted homes they found the child living with its adopted mother, and called it *Ægisthus*. Procopius says that he was there, and saw the child himself.\*

Within a few years there were wild men in the mountains of Tahiti, fugitives who had escaped from the general slaughter to which every man, woman, and child of a conquered tribe was doomed in Tahitian warfare. The missionaries saw two of these men who had been caught and brought down from the mountains at different times. One was quite naked, did not reply or seem to understand when spoken to, and showed horror at the sight of men. He refused the food and water which were offered to him, and escaped the second night after his capture. The other was of unsociable and wild aspect, but quiet. He seemed to take little interest in anything, and his general behaviour was that of a harmless lunatic.†

Few stories of wild men have made so much noise in the world as that of "Peter the Wild Boy," who was found wandering about the country near Hameln, in Germany, in 1724, and was supposed to be a specimen of man in a state of nature. His case was written and talked about for years; and writers on innate ideas, the origin of mankind, and similar subjects, reasoned upon it with more or less discretion. But when Blumenbach, the naturalist, came to examine the facts of the case, he proved to demonstration that Peter was nothing but a wretched mal-formed idiot boy, who could hardly have strayed from home many days before, for there was a fragment of shirt still hanging about his neck when he was taken. And just as Highlanders know a Cockney sportsman in a kilt by the first glance at his knees, so Peter's legs betrayed him. The colour of the skin above and below the knee showed that he had been wearing breeches, but no stockings, till a short time before he was taken. Peter's parents were eventually found, and his whole history traced.

For thousands of years there have been stories going about the world of children being carried off and brought up by wild beasts, and several new ones have come up in modern times. Blumenbach was not content with demolishing Peter the Wild Boy's claim to be a real

\* *De Bello Gothico*, Lib. II, cap. xvii.

† Ellis, *Polynesian Researches*, vol. ii., p. 504, &c.

wild man of the woods; he enumerated the other stories known to him of wild men, and children brought up by wild beasts, and after a severe criticism, tossed them all contemptuously aside; and since his time the whole subject seems to have fallen into discredit. Looking at the evidence which Blumenbach had before him, we cannot wonder at his coming to this conclusion.

Within the last few years, however, a statement has been published by Sir William Sleeman,\* which makes it necessary to re-argue the question whether children have really ever been carried away and brought up by wild beasts or not. I shall first examine Sir W. Sleeman's statement, and then compare it with the older stories of beast-children.

It appears that wolves are very numerous among the ravines which run down to the banks of the Goomtee river, and they carry away many children even out of the towns and villages. The Hindoos dare not destroy them, from a superstitious fear that if a drop of wolf's blood falls within the confines of a village, that village is doomed to destruction. Only the lowest vagrant class have no such scruples; but though they know the wolves' dens and could exterminate them if they pleased, they scarcely ever kill one, and the reason of their forbearance appears to be this. In India, even very young children go about loaded with ornaments of gold and silver, and these vagrants are supposed to find it a more profitable trade to search for such ornaments at the entrance of the wolves' dens than to kill the wolves for head-money. This is all credible enough, but now comes the wonderful part of the story.

When Sir William Sleeman was at Sultanpoor, there was a boy there who was said to have been found running on all-fours in company with a she-wolf and three cubs. The whole family were seen coming down to the river to drink, and the boy was caught. He had at first to be tied to prevent his running into holes or dens. He tried to run away from grown people, but if children came near him he rushed at them and tried to bite them, snarling like a dog. Cooked meat he rejected with disgust, but a piece of raw meat he would put on the ground under his paws like a dog and eat it with pleasure, and he would allow a dog to share his food with him, but would not let a man come near him while he was eating.

The boy was sent to Captain Nicholetts, commanding 1st Regiment Oude Local Infantry. Here he became somewhat tamer, was inoffen-

\* *Journey through the Kingdom of Oude.* London, 1855, vol. i, p. 206, &c.

sive unless teased, when he would growl. He would eat whatever was thrown to him, but preferred raw flesh, which he devoured greedily. Eating was the only thing he seemed to care for, and he appeared indifferent to cold, heat, and rain. He would not wear clothing even in the coldest weather. They made him a quilt, stuffed with cotton; but he tore it up, and ate it bit by bit with his bread. He liked bones, especially when uncooked, and would gnaw them as easily as meat. He ate half a lamb at a time, without apparent effort, would drink a pitcher of butter-milk without drawing breath, and would pick up earth and small stones and eat them. He ran to his food on all fours; but at other times he occasionally walked up-right. His features were coarse, his countenance repulsive, his habits filthy. He liked dogs, jackals, and other small quadrupeds, and would let them feed with him; and he had a pet, a paria dog, which he used to stroke and caress, and which ate out of his dish, till Captain Nicholetts, finding that the dog was depriving the boy of his food, shot it. The boy did not appear to care in the least about its death.

He did not become attached to any one, never played with children, and, indeed, shunned human beings, and would not remain near them, if he could help it.

During the three years this boy lived among men, till the last day of his life, he was never known to speak. When he wanted anything he used signs, and very few of them, except when he was hungry, and then he pointed to his mouth. But in his last illness, a few minutes before his death, he put his hand to his head, and *said it ached*, then he asked for some water, drank it, and died.

This boy was recognized by his parents; but they found him so stupid that they left him, to be supported by charity, and, unfortunately, they quitted the neighbourhood before any one thought of asking them his age when he was lost, and recording it. When he was caught he seemed to be nine or ten years old, and he lived three years afterwards.

In 1843, a boy three years old was carried off by a wolf at Chupra, while his parents were at work in the fields. Six years afterwards he was caught while going down to the river with three wolf cubs, and identified by a birth-mark and the scar of a scald. The wolf had been seen to carry him off by the loins, and the marks of teeth were still visible on them. The boy was alive at the time of Sir W. Sleeman's visit, and had been tamed to about the same degree as the

one last mentioned. His body smelt offensively. He would follow his mother about for what he could get; but appeared to feel no affection for her. He learnt to eat bread, and would eat what was given him during the day; but went off at night to the jungle. He used to mutter, but could not articulate any word. His knees and elbows were hardened with going on all-fours; he would tear off clothes if put upon him, preferred raw to cooked flesh, and would eat carrion when he could get it. The village boys used to catch frogs and throw them to him, and he ate them. When a bullock died, and the skin was taken off, he would go and eat it like a village dog.

As to the first-mentioned of these two boys, there is no doubt that Captain Nicholetts kept him, that Sir William Sleeman saw him, and that the description of his brutal condition in mind and body is to be depended on. I have a slight unpublished account, given by an Englishman who saw him, which agrees, so far as it goes, with the published statement. It describes him as an idiot of the *crétin* class, loathsome and disgusting to look at, unable to articulate, but making a noise like *bha-bha!* running at an extraordinary pace on his hands and feet when he liked. His ordinary gait was, however, erect. His speaking just before his death, if it really happened, may be accounted for as a reminiscence of his childhood, when some one may have taught him a few words, coming to him in the hour of death, a thing which often occurs. As to the second boy, I suppose that Sir W. Sleeman means to intimate that he saw him, as he was at Chupra at the time of his visit. The existence of the boys in an extraordinary state of brutalization may be taken as proved. But of their having been found living among wolves, we have no other evidence than that of natives, and it is pretty well known what Oriental evidence is worth as to such matters.

Sir W. Sleeman collected four more stories of wolf-children in the same district, and all the six are so curiously consistent with one another that it is possible to make a definition of the typical wolf-child, or rather wolf-boy, as we hear nothing of wolf-girls. He should be about ten years old, more or less, brutal and hideous in appearance, idiotic in mind, given to eating raw meat and garbage in preference to anything else, generally averse to wearing clothes, incapable, or almost incapable, of learning to speak, but able to understand and express himself by signs to some slight extent. I understand from Dr. Falconer, to whom I am indebted for information on

several points connected with the wolf-stories, that Mr. Pakenham Edgworth has met with a similar story in Central India.

If we examine the best of the earlier stories of beast-children, we shall find them very much like the modern stories from Oude. The wild child, of which we read in Wilhelm Dilich's Hessian Chronicle, as having been caught by hunters among wolves in 1341, is described as running sometimes on all-fours, and jumping an extraordinary distance. They could not tame it, and it avoided men, and would run and hide itself under benches. It could not bear the food given it, and soon died. A late version of the story is given by an anonymous monk, with some additional embellishments, as that the boy related that the beasts made a nest of leaves for him to lie in, and so forth ; but there is nothing of this in the original.

The two celebrated stories given by the old historian, Bernard Connor, are not unlike the others, except that the children are brought up by she-bears instead of she-wolves. His account is as follows : " There was one (child) kept in a convent. He was about ten years of age (which might be guess'd only by his stature and aspect), of a hideous countenance, and had neither the use of reason nor speech : he went upon all four, and had nothing in him like a man, except his Human Structure. But, seeing he resembled a Rational Creature, he was admitted to the font, and christen'd ; yet still he was restless and uneasy, and often inclined to flight. But at length, being taught to stand upright, by clapping up his body against a Wall, and holding him, after the manner that dogs are taught to beg ; and, being by little and little accusom'd to eat at Table, he, after some time, became indifferently tame, and began to express his mind with a hoarse and inhuman Tone ; but being asked concerning his course of life in the Woods, he could not give much better account of it than we can do of our Actions in the Cradle. Upon this occasion I was assured by the king himself, several Senators and other Great Men of that Kingdom ; and, moreover, it is the common and undisputed Report, that children are oftentimes nourish'd and brought up by Bears in these parts. They say likewise that if a hungry He-Bear finds a child that has been carelessly left anywhere, he will immediately tear it to pieces ; but, on the contrary, had it been a She-Bear, then giving suck, she would undoubtedly have carried it safe to her Den, and nourish'd it among her Cubs, which, after some time, might probably have been rescued from her, and been taken by Hunters, as it

\* *History of Poland*. London, 1698, vol. i, p. 342, &c. *Evangelium Medici*. London, 1697, p. 181, &c.

happened in another Case of this nature in the year 1669 which has been positively asserted to me in a letter from his Excellency Monsieur de Cleverskerk, now Ambassador here to his Majesty King William, from the States of Holland, which letter I thought not amiss to insert."

The letter, dated January 1, 1698, relates that the writer was in Warsaw in 1661, and saw a boy at a convent there, who they told him had been caught some time before at a bear-hunt. The description he gives comes to this, that the boy was a half brutal idiot, who ran on all-fours to seize the bread which was given him.

Another account of this case, apparently an independent one, is quoted by Koenig,\* from Hartknoch, *De Republica Polonica*. He says that in the year 1661 two boys were found in company with several bears in the woods of Grodno. One of them escaped with the bears into a marsh; but the other was taken. This boy appeared to be eight or nine years old, went on all-fours, and ate greedily such things as bears love, such as raw flesh, apples, and honey. He was taken to the king at Warsaw, and baptized Joseph. With some difficulty he was taught to walk upright. He could not learn to speak Polish, but expressed himself with a bear-like growl (*murmure ursino*). The king gave him to a vice-chamberlain of Posnan called Peter Adam Opalinski, in whose kitchen he was employed to carry wood, and do menial work. But he never lost his wildness, and would sometimes go off to the woods, where the bears never molested him. Koenig gives at full length a wearisome Latin poem, which was written about this Joseph in 1674.

There are two more stories, cited by Koenig, of a wolf-child caught in the forest of Ardennes, and of a wild man, going on all fours, caught in the forest of Compiègne.

As to the other stories of wild children, they are scarcely worth mentioning. The boy described by Tulp (*i. e.* tulip, a surname interesting as belonging to a Dutch burgomaster), who was brought to Amsterdam (probably as a show), and who had been caught in Ireland living among *wild sheep*, who ate grass and hay and bleated, was, as the very description shows, a poor dumb idiot, and about as much a wild boy as the wretched malformed Red Indian children that drew crowds of sightseers in London, not long ago, were "Aztec Children of the Sun." The girl caught living wild in Holland (of all places in the world), in 1717, who fed on grass and leaves, and had made herself a girdle of straw; the two boys seen to leap from crag to crag, like

\* *Schediasma de hominum inter feras educatorum statu naturali solitario*. Hanover, 1730.

goats, in the Pyrenees, in 1719; Lord Monboddo's friend, the wild girl, who was caught at Châlons-sur-Marne, in 1731, diving for fish in the river; and the wild boy of Bamberg, who lowed like an ox, may be dismissed without further remark.

The whole evidence in the matter comes to this. First, that in different parts of the world children have been found in a state of brutalization, due to want of education or to congenital idiocy, or to both; and, secondly, that people often believe that these children have been caught living among wild beasts, a supposition which accounts for their beast-like nature.

Now stories of children being brought up by animals are found among the popular myths of several parts of the world. Of these, the tale of Romulus and Remus is the best known example. Here the idea of children being suckled by a she-wolf is joined to another incident often found in the old wonder-tales, the setting adrift of children in an ark, after the manner of the infant Moses in the ark of bulrushes. The infant Cyrus is said to have been brought up by a bitch,\* and the attempt to rationalize the story by considering bitch (*Cyno*), to have been the nurse's name, as well as the similar explanation of the myth of Romulus and Remus, are evidently mere commentator's work.

A curious story in the *Kathâ-sarit-sâgara*, or *Ocean of the Rivers of Story*, a collection of Sanscrit wonder-tales dating from the twelfth century, belongs to the class of myths of beast-children. A certain Yaksha, or jin, whose name was Sata, saw the daughter of a holy man bathing in the Ganges; and both being inflamed with love at first sight, married one another by what is called a Gandharva-marriage, that is a sort of Scotch marriage, which was nothing but an agreement between the two parties without witnesses or any formality whatever. Such unions, which were only allowed to the warrior-caste, seem not to have been uncommon in India, to judge by the frequency of their occurrence in stories; but in this instance the lady's relations seem to have considered the proceeding immoral, much as we should have done. So they turned the young couple, by magic, into a lion and lioness, telling them to go and wander thenceforth, following only their own devices, as the lions do. The lioness died afterwards in giving birth, not to a cub but to a human child, and the father-lion made the other lionesses suckle the boy, who grew up and became the world-ruling king Satavahana.

In another Indian story,† the daughter of a Brahmin is delivered of a child while on a journey, and is obliged to leave it behind in a wood,

\* *Herod.* i, c. 122.

† *Lassen. Indische Alterthumskunde*, vol. ii, p. 809.

where a female jackal suckles it till it is rescued by some passing merchants.

Professor Albrecht Weber, of Berlin, whom I have to thank for the reference to the last two stories, tells me that he does not know of any stories of wolf-children in Sanskrit literature, which is, I believe, equivalent to saying that there are none in such Sanskrit works as are known to European scholars.

Dr. Prichard speaks of an Asiatic Saga which relates "the fate of a single family, born, or perhaps, if the story were rightly interpreted, suckled, by a wolf in Turkish Assena, or Tsena, who became the founder of the Turkish dynasty on Mount Altai." Whether the story in question really belongs to the same class with those just mentioned I am not at present prepared to say.

It should be remembered, also, that among the animals into which, according to a most ancient and wide-spread popular belief, a man can transform himself, the principal are the wolf and the bear. Men who have the power of changing themselves into wolves are called were-wolves (*i. e.* man-wolves), *λυκανθρωποι*, loup-garous, turnskins, turncoats; and the Norwegians believe that the Laplanders have the faculty of turning themselves into bears, so that the close connexion of these animals with man is a thing recognized in popular mythology.

The belief that bears have human souls occurs among the Indians of North America, and the custom of asking pardon of the bear before killing him is found there as well as in the old world. Mr. Gibbs tells a story he heard of an Indian tribe in California who begged the life of a wrinkled-faced old she grizzly-bear, into whom they firmly believed the soul of a deceased old woman of their tribe had migrated, she was so like her.\* I have not met with any story of children suckled by wolves among the North American Indians; but there is a Chippewa tale which comes very near to it. A deserted child goes and lives with the wolves, who leave food for him. He gradually becomes more and more wolf-like; his brother at last finds him half turned into a wolf, and before he can catch him the transformation is complete.†

That among ignorant and superstitious men the step is easily made from an abstract belief in such stories to the application of them to particular persons, is a thing which hardly requires proof. Not many years ago, in districts where it was believed that witches could ride on spits and broomsticks, it was easy to obtain evidence enough against particular old women to satisfy the rest of the world that they had committed this diabolical act, and to cost the old women their

\* Schoolcraft's *Indian Tribes*, Part III, p. 113. † *Id.* Part II, p. 232.

lives. The enormous influence which a belief in witchcraft has had, and still has, in the world, is due, in great measure, to its supplying an explanation of real events, such as storms, and the sickness and death of animals and men. In like manner there are facts which lend countenance to a belief in children brought up by wild-beasts, among a credulous and illogical people. The existence of idiots, no doubt, has been accounted for on this supposition, when the still more convenient belief in *changelings* has not taken possession of them.

It is easy to show how such stories may come to be believed as matter of fact, by an example which has this advantage over the stories of beast-children, that the matter of it is not only improbable, but ridiculously absurd. It would be, perhaps, imprudent to assert that it is *impossible* that children might be suckled by wild beasts, though the fact that the she-wolf drives her cubs away to shift for themselves before they are a year old is not very compatible with the notion of a child being an inmate of the family for several years; we can only say that it is very improbable and not to be believed but on the best of evidence; but if all the Asiatics living were to declare with one accord that a child and a crocodile had been born twins at one birth, we should not believe it. This idea of children and animals being born together is, however, common in the folk-lore of the East. There is a story in the Panchatantra of a Brahman woman bringing forth together a boy and an ichneumon.\* Among the Land Dayaks there is a legend of a woman who brought forth at once a child and a cobra de capella. This is mere legend; but when Captain Cook and Sir Joseph Banks were in Batavia they found it believed as a matter of fact that children had often crocodile twins. Such crocodiles were at once carried down to the river by the nurse; and the family, especially the twin-child, used to throw food into the river for it from time to time. Not only were they assured by every Indian they asked that such things did happen, but many told them that they had frequently seen them. One girl declared that her father had charged her on his death-bed to carry food to his Sudara Oran, as these man-crocodiles are called. It used to come and eat out of her hand when she called it; it had a spotted body and a red nose, gold bracelets on its feet, and *gold earrings in its ears*. Another native assured Mr. Banks that he had seen a Sudara Oran. Mr. Banks replied that such stories were nonsense, as he had been told of one which had earrings, whereas everybody knew that crocodiles had no ears to put them in; to this the man replied that the Sudara Oran were not like other crocodiles,

\* Book v, sec. ii.

they had five toes on each foot, large tongues which filled their mouths, and ears also, *although they were indeed very small*. Whether the great naturalist was right or wrong as to the abstract possibility of fastening earrings into a crocodile's ear-holes, I cannot exactly say, but the story is very remarkable as recalling the description of the tame crocodiles which Herodotus says were kept by the Egyptians who dwelt near Thebes and Lake Mœris, which had earrings of molten stone (*i.e.* probably glass), and gold in their ears, and bracelets on their forefeet.\*

Such stories as Sir Joseph Banks's afford a fair criterion by which we can judge of the value of Oriental testimony about wolf-children. I cannot see that the whole evidence on the subject proves anything whatever, except the existence of the stories, and the fact that there have been and still are people who believe them. The whole matter may be safely given over to the student of Comparative Mythology, to whom it is a subject not without interest.

Even the well-authenticated cases of human beings found living in a state below that of the lowest savage tribes, are of little value to the Anthropologist. It is impossible to say in the case of any one of them how far their miserable condition was the result of want of civilization and how far of idiocy. Casper Hauser's case is of more value than all of them put together, as he, if the published accounts may be believed, seems at least to have been naturally of full powers of mind.

The original men, as the poet describes them, roaming, "a dumb and miserable herd," about the woods, do not exist on the earth. The inquirer who seeks to find out the beginnings of man's civilization must deduce general principles by reasoning downwards from the civilized European to the savage, and then descend to still lower possible levels of human existence, with such assistance as he can gain from the study of the undeveloped human mind in children, and in the blind and deaf and dumb, who have been prevented by physical defects from receiving much of the knowledge which is current among their fellows, and who are therefore often obliged to form their opinions from the direct evidence of their senses, without sharing in the treasury of knowledge which has been accumulating for so many ages, and comes almost unconsciously to ordinary children.

\* *Herod. II, c. 59.*

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## ON THE INDIAN TRIBES OF THE GREAT DISTRICT OF LORETO, IN NORTHERN PERU.

BY PROFESSOR ANTONIO RAIMONDY OF LIMA.

TRANSLATED FROM THE SPANISH\* BY WM. BOLLAERT, F.A.S.L.,  
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THE province of Loreto is as large as all the other departments of Peru together. It is bounded on the north by Ecuador, on the east by Brazil, on the south by the departments of Cuzco, Ayacucho, and Junin, and on the west by the departments of Libertad and Amazonas.

In the south and west the country is broken by mountains. In the north and south it is covered by a luxurious vegetation, and has a wonderful net-work of rivers which run into the mighty Amazon.

The climate is generally hot and humid, but the high temperature is not very inconvenient, in consequence of the air being continually refreshed by frequent rains, and by the evaporation of the water which covers so much of the land.

However, during mid-day time on the wide sandy shores of the Amazon and Ucayali, the sand is too hot to walk upon.

The native inhabitants of Loreto differ entirely from those of the other portions of Peru. During the Incarial times they were unconquered tribes of savages, and even at this day many preserve their independence.

Thus we have in this portion of Peru reclaimed and wild Indians natural to the soil; other Indians who have come into the country from the north and from the east since the Spanish conquest; and others, the result of the mixture of the reclaimed, wild, and intruding tribes.

The wild Indians, or, as they are called by the Spaniards, infidels, belong to many tribes, speaking generally a separate language. The reduced Indians also belong to various tribes, and speak distinct

\* This account is from a Memoir presented to the Peruvian Government by Professor Raimondy, entitled *Apuntes sobre la Provincia litoral de Loreto*, and printed in Lima, 1862.

languages; but a great portion of the latter speak Quichua, or the Inca language, and understand Spanish.

The inhabitants of Moyobamba (5° 30' 29" S.), are, some whites, and mixed with Indians. Those of Tarapoto are divided into whites and mixed, and Indian; to the latter may be added the Lama tribes; these Indians of Tarapoto hunt with the *cerbatana* (blow-pipe), in which they use the poisoned arrows, anointed with the poison of the Lamas, from whom they procure it.

The Indians inhabiting the banks of the river Huallaga, in the districts of Tingo Maria and Pachiza, belong to two nations reduced in 1676, known under the names of Cholones and Hibitos, having their own languages.

A great portion of these people are only Christians in as far as they have been baptised. They are idle, and pass the greater portion of their time in drunkenness, produced by their *masato* (a liquor made from the yuca). They paint their faces and bodies with the fruit of the huito or jagua (*genipa oblongifolia*), and with the *achote* (*bixia Orellana*), and scarcely cultivate the most necessary plants for their maintenance. They now wear a shirt and short trowsers, of a cotton cloth, dyed blue with a species of wild indigo.

The Indians of the Jévaro country\* (partially reduced in 1517,) have their own language; some of them also speak Quichua; they are employed as servants in Moyobamba, and have learnt Spanish. They are robust, docile, and hard-working field hands.

These Jévaros carry loads of a hundredweight with ease over the worst of mountain tracks. They dress with the short cotton shirt and trowsers; the women use a covering for the lower portion of the body called the *pampanilla*, protecting sometimes the upper portion with a mantle, and in which they generally carry their children before them.

The reduced Indians of Yurimaguas belong to various tribes, the principal one being the Cocamillas, who now inhabit the village of Laguna. They are tractable, and clever in river navigation, principally on the Huallaga, which is a very difficult one. They dress in the short shirt and trowsers, and use the blow-pipe when hunting, in which they are most dextrous.

The Indians of Nauta are baptised, and are composed of three distinct nations, namely, Llameos, Cocamas, and Omaguas, each speaking a different idiom. They are land-carriers and boat-men.

\* I have already given an account of the Jévaros of Ecuador in Trans. Ethno. Soc., 1862, in connexion with the "Idol Human Heads" of this nation.—W. B.

Independently of the *cerbelana* they use the *sisga*, or harpoon (?), to take the *pachi* (*Vastres gigas*) and the sea-cow (*Manatus Americanus*).

The inhabitants of Iquitos, Pebas, and Loreto, are a mixture of baptized and wild Indians, belonging to tribes, as the Iquitos, Pebas, Yaguas, Orejones, Ticunas, and Mayorunas. The baptized ones cover the lower portion of the body, but the wild ones go nearly naked. They ornament the face with red and black stripes, and use lances and poisoned arrows.

The Yaguas are not all-looking, cover the lower part with the bark of the llauchama; their hair is cut short, and at times adorned with feathers; some put feathers on the arms and neck.

The Orejones go naked, wearing the hair long, and have the custom of inserting round pieces of wood in the thick of the ear, the lobe at times reaching to the shoulder; this has given them the name of *Orejones*, or big-eared. Some of them pass a piece of wood through the cartilage of the nose, and paint the face with *achote*. These Indians prepare the poison for the use of many others in this portion of Peru.

The Ticunas go naked, their hair is long at the sides and cut short in front; they wear a collar of the teeth of the jaguar or the monkey. They also prepare poison.

The Mayorunas pass a piece of wood through the lips. Some are pretty docile and industrious, but others, who wander about the forests, are always at war with the wild Indians of the Ucayali. Those tribes which frequent the Ucayali, to salt the fish they catch, do not sleep on the right bank for fear of the Mayorunas.

In that portion of the Marañon between the Pongo de Manseriche\* and the mouth of the Pastasa, the wild Jévaros are found, divided into Muratos, Huambisas, Aguarumas, and Antipas; they generally go naked, are of good figure and active, very warlike, and use the lance with dexterity. This portion of the Jévaros are continually at war with each other, but mostly the Aguarumas with the Antipas, who live above the Pongo de Manseriche.

The Aguarumas dwell between the mouth of the Nieva and the Pongo de Manseriche. This tribe was discovered in 1859, by the expedition headed by the Bishop of Chachapoyas. At present they

\* This term is given, in Peru, to all straits in a river, formed by high mountains on either side, and when the sides are perpendicular. It comes from *Puncu*, a Quichuan word, meaning door. The Pongo de Manseriche is six miles in length. It only took Condamine fifty-seven minutes to pass through the Pongo; its narrowest part was fifty-eight yards.

are nearly all reduced, and go frequently to the city of Chachapoyas (6° 7' 41" S. 78° 55' W.)

The Jévaros have a language of their own, which is sufficiently expressive, and not disagreeable to the ear. Some of the Jévaros, especially a few of the chiefs of the Aguarumas, understand a little Quichua, by which it would appear that a portion of them had been subjugated by the Incas.

The shores of the Ucayali and its affluents are inhabited by many other wild tribes; some, however, have been reduced and live in the village of Sarayaco.

The principal wild tribes of the Ucayali and its affluents are the Piros, Campas, Amahuacas, Remos, Conibos, Setebos, Sipibos, and Cashibos. All these, excepting the last, who inhabit the river Pachitea, cover themselves with a loose garment called the *cusma*, which is made of cotton cloth, woven by themselves, varying in width and colour according to the tribe.

The Piros are those known in the forests of Cuzco under the names of Chontaquiros and at some points of the Ucayali as Simirinches. Of all the tribes dwelling on the Ucayali the Piros are the most intelligent, brave, and good-looking. They barter wax, collected in their woods, for tools, cotton cloth, fish-hooks, glass beads, &c. Their principal village is called Santa Rosa de los Piros, and situated at the confluence of the Rivers Tambo and Santa Ana or Urubamba.

The name of Chontaquiros given to the Piros of the forests of Cuzco is in consequence of the custom they have of dyeing their teeth with a root, which gives them a black colour,—the *chonta*, black wood, and *quiros*, tooth. The Setebos, Sipibos, and Conibus blacken their teeth with *chonta* also.

The Piros speaks a different language to the other wild tribes of the Ucayali, and they are at once known by their using a blackish *cusma*.

The Campas are known also by the name of Antis; they occupy a large district, that between the river Santa Ana, of the forests of Cuzco, and the river Chanchamayo of the forests of Tarma.

The Campas form a numerous nation, strong, and warlike. They are distinguished from the Piros by having a different language, by not dyeing their teeth black, wearing a larger *cusma*, and of a yellowish colour.

Their language is different from that of the Piros; its abundance of vowels makes it pleasant to the ear. But what is curious is, that although there is scarcely one word which is common to the two lan-

guages, nevertheless they have a similar peculiarity in that the names of all parts of the body begin with the same letter : thus in the language of the Piros the W is used, in that of the Campas the N.

The Campas inhabiting the forests of Chanchamayo are most warlike, and will not enter into friendly relations with the white man. It has to be observed that portions of these tribes, which dwell in the valley of Santa Ana, in the department of Cuzco, where they have been well treated, are reasonable enough. The use of the cannon and musket is not the way to make them friendly.

The wild Amahuacas live on the banks of the affluents of the Ucayali; they are docile and intelligent; in consequence, of not having a warlike disposition, they are invaded by the Piros, Conibos, Setebos, and other nations, who surprise the Amahuacas, generally killing the men, selling the children as slaves, and keeping the women. At the mission of Sarayaco I have seen some young Amahuaca boys, who had learnt in a short time to read and write correctly.

The Amahuacas extend far into the interior from the right bank of the Ucayali, and some of them give us the information of a nation of Negros, with whom they are at peace. It would appear that these are most likely fugitive slaves from Brazil.

The Remos are wild, and inhabit the extensive country to the right of the Ucayali, between the mountains of Canchahuaya and the river Tamaya; the greatest number inhabit the valley of Callaria.

The Remos, as well as the Amahuacas, being rather peaceful, have inroads made upon them by the Conibos, on which account Father Calvo founded about 1859 the village of Callaria, so as to prevent the incursions of the Conibos.

The Remos are distinguished from all the others, instead of painting the face with *achote*, or with *huito*, they tatoo themselves by picking the skin with a spine, and then introducing the smoke from copal resin.

The Setebos, Sipibos, and Conibos are not easily distinguished, because they dress almost alike, and speak the same language, which is the Pana. They wander about the Ucayali, from the river Pachitea to the Marañon. The Campas and some of the Piros perforate the *tabique*, or tip of the nose, suspending from it a small silver plate, which covers a portion of the upper lip.

The Conibos still preserve the custom of flattening the heads of their children between two boards; one is applied in front, the other behind; so that the forehead is made to fall back, and the head is lengthened behind, which looks very much like the crania found in

some of the ancient tombs of Peru. In the mission of Sarayaco I saw a young male child, who had been brought to be baptized, and, independently of flattening the head, so that it should be elongated behind, it had a round knob on the frontal bone. I was informed that the board which had been placed in front had a hole in it, and through this hole the frontal bone of the head had been pressed.

The wild Setebos, Sipibos, and Conibos have, principally in adults, a rough cutis, almost squamose, owing to the constant biting of mosquitos, as well as from a species of itch very general amongst them.

We have said that these wild tribes invade the Remos and Amahuacus, to steal their children and women; the cause is that all the savages of the Ucayali are polygamists, and not having a sufficient number of women of their own nations, steal those of others.

The Caschibos are the most savage of the tribes who dwell on the Ucayali and its affluents. They are to be found mainly on the shores of the rivers Pachitea and Aguaitia, and go naked. They have been considered cannibals; still I have my doubts of this, and if it is true that they eat their old men, this custom is rather connected with a religious superstition than an act of cruelty. It is said that when it is announced to an old man that he is to be a victim, he is filled with joy; for he believes that he will soon join his departed relations. However this custom of eating the old people is common to many other of the wild nations of Peru; for Osculati, the Italian traveller, when among the Mayorunas, in his descent of the Napo to the Amazonas, says, that a Mayoruna, who had been baptized, when at the point of death, was very miserable and unhappy; and on being asked why he was so, replied that he was wretched indeed, because, dying as a Christian, instead of furnishing a meal to his relations, he would be eaten up by worms.

In my opinion the wild Caschibos might be reduced as well as others; and a convincing proof is that Father Calvo, having made several journeys to the river Pachitea, entered into relations with many of them, and has now more than a hundred friendly to his Christian views. If he has been successful, it is that he has not employed the force of arms, but peaceful and humane manners, presenting them with knives, fish-hooks, glass beads, &c.

I believe that all the wild Indians may be reduced. Our object should be to inspire them with confidence, to give them knives and hatchets, and teach them the importance of these instruments in the construction of their arms, canoes, &c., in a word, create

necessities, such as they cannot satisfy of themselves. Such men only know the physical and material which speaks to their eyes most convincingly,—the presents of a fish-hook, a knife, or a hatchet, have more power than the most eloquent discourse. Here is a proof. I saw a Conibo at Sarayaco, who, having received some fish-hooks for having brought his child to be baptized, on the following day brought it a second time, so that he might receive a similar present.

There can be no doubt that the best method to reduce the wild man is to give him fish-hooks, whet-stones, needles, hatchets, and knives; and when he has worn out any of these, and cannot of himself replace, he will come and put himself in relation with the white man; then let there be some good and patient missionaries ready to receive them as friends, who will beg of them to live in villages, and change their wild customs; they will awaken in the red man the love of labour, his intelligence will be exercised, and his ideas will be elevated towards better things.

The infidel Caschibos appear to be related to the Setebos, Sipibos, and Conibos; for they all understand the Pana, and it is probable that what they speak is a dialect of the same language.

The Pana language is the most general on the Ucayali and its affluents, and spoken with but little differences by all the wild Indians, excepting the Piros and the Campas. The Pana is most distinct from the Quichua. Considered relatively, and in regard to the necessities of the Indians who speak it, it is sufficiently rich; but it has many words which can not be translated into another language excepting by making a phrase of it.

The pronunciation is somewhat difficult, because there are many very aspirate and guttural words; also many that, to pronounce them, the tongue has to be applied to the root of the teeth.

The particle *ma* interposed to a verb means that another has to do what is indicated by the verb; for example, the word *pique* means to eat, the word *pimaqui* indicates the making another eat.

All the natives of Loreto have an incomplete system of numeration, and only up to 3, 4, and 5, indicating by the fingers when they exceed 4 or 5, and in expressing by the word *many* when they cannot express by the fingers.

The Jévaros count up to five in their own language; but have completed their numeration by taking the Quichua numbers, which are complete. Thus the Jévaros count up to five in this manner: *alza*, one; *catuta*, two; *kala*, three; *ingatu*, four; *aleytiolon*, five; and

then continue with the Quichua up to ten. Above ten, and in which enter their own five, they mix the Jévaro and Quichua numeration.

With regard to the population of the wild Indians, their number has been exaggerated; some have put it down as high as 200,000. My opinion is that they do not amount to more than 30,000 to 40,000. However, I believe that in former times the number was much greater, but diminished by the visitation of various epidemics.

Father Pallarez, in 1854, made a careful visit into all the valley right and left of the Ucayali, from Sarayuco to the river Tambo, taking with him an organ to amuse, which caused them to leave their fastnesses to hear it. He gives the number of Indians at 1830, composed of 709 men, 699 women, and 422 children under fourteen years of age. With that number we may calculate, including those who did not come to him, a total of 2,000 individuals, who inhabit this great extent of country. Adding another 2,000 for the Campas; and the few who live above the river Tambo and below Sarayaco, we shall have a population of 4,000 inhabiting the whole extent of the Ucayali and its affluents.

Giving rather an exaggerated number of inhabitants on the shores of the rivers Tovari, Napo, and Pastasa, and their affluents, and a 1000 to 2000 for each of the other rivers, which run into the Amazons in the Peruvian territory, we do not quite come up to 30,000 or 40,000. Including now the whites and mixed breeds of the districts I have gone over, there may be 45,000. To this number 4000 to 5000 may be added, consisting of a scattered population. Thus we have about 50,000 reduced Indians in the province, and the 30,000 or 40,000 wild ones, will give a population of 80,000 to 90,000 for this very large district of Loreto.

The country of Loreto, independently of its valuable tropical vegetable productions, contains within its mountains much common salt, sulphate of lime, alum, sulphur, iron ore, lignite, and gold; this last is found principally in the river Napo, and in various parts of the Marañon, particularly near the Pongo de Manseriche. The main gold-washings are the Chaupirumi, Pucayaco, San Ignacio, Paragua, Calentura, Achiral, Limon, Nitagua, &c. There are accounts that this precious metal exists in abundance in the mountains of Angaisa, where the waters of the Mayo rise, passing Mayobamba (5° 30' S.), and other rivers that flow into the Marañon.

The plantain is the bread of the inhabitants of this region. From the ripe fruits an alcoholic drink is made; from the green a sort of

paste or mortar is made to stop up interstices in the rude earthen still, from which they distil a spirit from the juice of the sugar-cane. Indeed the plantain affords food to fowls, pigs, and horses.

The Yuca (*Manhiot aipi*) is the other vegetable most indispensable to the Indians. 1. It forms their bread when roasted in the ashes. 2. From it they prepare their favourite and indispensable drink the *Masato*. To give an idea of the mode of preparing this drink, one must enter the large habitations of the wild inhabitants of the Ucayali, before one of their feasts. On one side are seated many half-naked women around a heap of *Yucas*, peeling them; in another place a woman is employed in putting the cleaned Yucas into an earthen vessel, large enough to hold a man. A little water is then introduced; the Yucas are covered with leaves, and the whole boiled. After the boiling the Yuca is beaten into a paste, generally in the hollow of a tree, which is their principal article of furniture. The women, and sometimes the men, now sit round the heap of Yuca paste, each taking a mouthful, and masticating it, and then spitting it out on the heap.\* This operation is repeated as many times as is necessary to turn the Yuca into *Masato*. The whole is now mixed with the hands, and then it is put into earthen vessels to ferment for from two to four days. This fermented Yuca paste is known under the name of *Masato*, and is taken with them on their journeys to serve as food and drink. When they wish to have a drink they take a handful of *Masato*, rubbing it with their hands into the quantity of water they think necessary. 3. Arrow-root or Chuño is also prepared from this plant, and goes by the Brazilian name of *Farina*. This operation is performed by slicing the Yuca, putting it into a roomy wicker vessel, which can be extended longitudinally, acting as a press. By this operation all the liquid portion is pressed out; the solid portion is removed and toasted in earthen vessels, and is then ready for use and sale.

In many portions of Loreto a crop of Yuca is produced in six months, so that at times they plant it on the shores of the rivers, the moment the waters begin to subside, and reap their crop ere the waters of rain rise again, and this without working the land.

Rice and maize give abundant crops in five months; the sugar-cane in six or seven months; the cocoa yields six crops annually; tobacco grows luxuriantly; cotton (*G. aboreum* and *G. Peruvianum*), grows spontaneously, from which they weave *tucuyo*, cloth for use and sale.

\* A similar operation is performed by other Indians in Peru, on the Maize, for making their favourite drink of *Chicha*.

Coffee and cocoa grow luxuriantly and spontaneously; the *bombonaje* (*Carludovica Palmata*), from which the so called Panamá hats are made, is not cultivated, but grows wild. The *Pischuago* (*Guilielma speciosa*), an elegant palm, yields its fruit for food. The *Aguaje* is another palm (*Mauritia flexuosa*), which yields food; also by incision a liquid flow from which alcohol is made, and it produces a sago. The Tutumo (*Crescentia cujete*), from the shells of the fruit their domestic vessels are made.

This same region produces many other indigenous and foreign fruits, as the orange, lemon, palto (*Persea quatisima*), pacays (*Inga vera*, etc.), lucumos (*L. obovata*), marañon or anarcadium (*A. occidentales*), papaw (*C. papaya*), plums (*Bunchosia*), cherries (*Malpighia selosa*), the bread fruit (*Artocarpus*), etc.

There are cultivated pine-apples (*Bromelia ananas*), weighing eighteen pounds, ajii, (*Capsicum*), kidney beans (*Phaseolus*), and the achote (*Bixa Orellana*), which is used to colour some of the dishes of food; to say nothing of the spontaneous vegetation of *Heliconius*, *Alpinus*, *Marantas*, *Justicius*, *Costus*,—plants that may be reared in European gardens. Of medicinal plants: the Ipecacuana; the Erychotria, affording yellow dyes; the useful Yarina (*Phytelphas macrocarpa*) or vegetable ivory; the barbasco (*Jaquinia armillaris*), the root of this is used for intoxicating the fish in the rivers, and thus taking them with greater facility; simalax of various sorts; the huaco (*Mikania*), used against the bites of serpents: the sanango (*Tabermontana*, *S.*), used in rheumatism, so common in these humid regions; vanilla; cocculus; strychnias (from the last the Ticunas of the Amazons prepare the poison).

The odorous pucheri (*Neitandria P.*), the fruit of which is used in dysentery; the quina-quina, yielding the balsam of Peru; copiba; chinchonas; matico (*Arante elongata*), to cure wounds; the wax palm; mahogany; cedar; balsa wood (*Ochroma piscatoria*), and very many others. The llanchma tree yields a stuff used for bedding; the tacuari gives a thin bark, used in lieu of paper for cigars; the huimba (a *Bombax*); the vitu or Jagua (*Ginipa oblongifolia*); the fruit yields a blue colour, used as a paint, and for protecting their bodies from the mosquitos; the setica (*Cecropia pellata*), in the hollow trunk of which lives a bee that produces wax and honey, the caucho jebe, or India-rubber plant (*Siphonia elastica*), &c., &c.; Then the great family of Palms, and beautiful flowering plants without number.

The Ticunas of Loreto are the principal preparers of the "Ticuna

poison," which they extract from ~~nine~~ different species of plants (probably of the *Strichnos* family); a bird or animal struck with a poisoned arrow dies in two or three minutes. They likewise "disecan" (stuff) birds and some animals with a "natural" preparation; but this sort of preserving does not last. They make brei, pitch, or tar, hammocks and rope from the *Chambira* palm, and flour from the *Yuca*. They use the bow and arrow and blow pipe. They go nearly naked, and are pacific.

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## A DAY AMONGST THE FANS.

By R. F. BURTON,

VICE-PRESIDENT OF THE ANTHROPOLOGICAL SOCIETY OF LONDON.

H. M. CONSUL AT FERNANDO PO.

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"It was my hint to speak: such was my process;  
And of the cannibals that each other eat,  
The anthropophagi, and men whose heads  
Do grow beneath their shoulders."—OTHELLO.

SIR,—I make no apology in forwarding to our young society a few notes touching a people who, during the last two seasons, have excited so much curiosity amongst Anthropologists—the Fans, or so-called *cannibal* tribes of the Gaboon country. After a fruitless search for Mr. Gorilla, I returned to the "Baraka Factory," Mr. Bruce Walker's hospitable house on the Gaboon river. When due preparations had been made, I set out at noon, on the 10th April, 1862, in the *Eliza*, a schooner belonging to the establishment. The navigation of the "water of Mpongwe" or Gaboon river, which forks at the island of Ynenge-Nenge ("isle, island"), was not a treat. The *Nkomo*, flowing from the N.N.E., and the *Mbokwe*, or lesser branch—my line of travel—from the N.E., are equally monotonous, muddy, and mangrove-grown, to say nothing of the mosquitos. After passing several *Bakele* and *Fan* villages, whose noisy inmates turned out to cheer and chaff, and after experiencing violent tornados, which this year have been more than usually frequent in the Gaboon

country, we anchored at 8:50 p.m., on the 12th April, off Máyyá<sup>n</sup>.\* I presently landed, under charge of Mr. Tippet, a most intelligent coloured man from the United States, who acts as native trader to Mr. Walker for ebony and ivory, near the head of the Mbokwe. On the 15th April I walked to the sources of the Gaboon river, which rises in a well-wooded sub-chain of the Sierra del Crystal; and on the 17th April I found myself once more in the "Baraka Factory."

My account, therefore, will contain little beyond "first impressions." First impressions, however, are not to be despised. Veterans are prone to deride Mr. Verdant Green, who, after a week, where *they* have spent years, ventures to record his experiences. They are wrong. Books like *Eöthen*, or the *Crescent and the Cross*, were written by men upon the wing. No "old resident" could produce such life-like, vivid pictures. The longer we remain in a place, I need hardly say, the the more our sensations are blunted, and their expression necessarily becomes like a MS. from which, by careful correction, everything salient or interesting is eliminated.

I now return to my day amongst the Fans. Arriving at Máyyá<sup>n</sup> all the guns on board the schooner were double-loaded and discharged, at the instance of Mr. Tippet, who very properly insisted upon this act of African *politesse*. We were answered by the town muskets, which must have contained the charges of old four-pounders. It was dark when passing through the sable masses that awaited upon the gloomy river bank their new merchant, i. e., white man; we proceeded to Mr. Tippet's extensive establishment, where I was duly immured like a queen bee. Accustomed to the frantic noisiness of an African village, my ears, however, here recognized an excess of out-bawl, and subsequent experience did not efface this "first impression." But noisiness, like curiosity, is a good sign in the barbarian. The lowest tribes are too apathetic to shout about, or to look at anything however strange to them. At 5 a.m. of the next day, after a night with the gnats and rats, I arose and cast my first nearer look upon a Fan village. Like those of the Mpongwe—whom the French call "*les Gabons*," and who are the remnant of our ancient "Pongos"—it is a single street, about half a mile long, formed by two parallel rows of verandahed huts, looking upon a line of yellow clay road, which is broken by three larger huts, pawaver or club houses, where the men assemble. The people were far more interesting. Expecting a large-limbed, black-skinned, and ferocious looking race, I was

\* It is proposed thus to write the very nasal nasals of the Fan language.

astonished to see a finely-made, light-coloured people, of decidedly mild aspect. The features, also, were sub-African, many, if whitened, might pass for Europeans; few were so negroed in type as the Mpongwe, none so negro as the blacks of Guinea or Kongo. Their aspect, however, is that of a people freshly emerged from the "bush." Many of them point their teeth. The grotesqueness of their *perruquerie* can only be rivalled by the variety of dress and ornament. No two are alike. The hair is not crisply-woolly, like that of the Coast tribes. In some women it falls below the neck nape, and the texture is of a superior order. The males wear it in plaits, knobs, and horns, with stiff twists and projections rising suddenly some two inches from the circumjacent scalp. One gentleman had a pigtail hanging to his shoulders, and there confined by the neck of a Bordeaux bottle instead of a ribbon. Some heads are adorned with tufts, bunches, and circles of plumes, or single feathers, especially of the touraco (*Corythrix*), an African jay, whose red spoils are a sign of war. Skull-caps of palm leaf plaited and blackened are common in the interior, but are here rare; an imitation, however, is made by plaiting the hair longitudinally from occiput to sinciput, reducing the head to a system of ridgelets, and the poll is surmounted by a fan-shaped tuft of scarlet-dyed palm leaf. I noticed a (to me) new fashion of crinal decoration. Two or more threads of hair, proceeding usually from the temples, sometimes from the sides, or from the back of the skull, are lengthened with three fibres, and finished with red and white beads, each in single line, so long that they fall upon the breast or back. The same is done to the beard, which sprouts in tufts from both sides of the chin; it is not thick, and moustachios are as usual wanting. Allow me to end this part of the subject by assuring you, that whatever absurdity in hair may be demanded by Europe, I can supply you to any extent from Africa. Gentlemen who part their locks like Scotch terriers all down the back should be grateful to me for this truly sporting offer.

The complexion of the Fans is, as a rule, *café-au-lait*, the distinctive colour of the African mountaineer or man from the interior. Some few are very dark; these, however, are of servile origin. There is not much tattooing, the shoulder alone excepted, amongst the men. The "*Gandins*," however, disfigure themselves with powdered cane wood, mixed with butter-nut, grease, or palm oil—here a luxury. The latter is a custom probably derived from the coast tribes. Nothing simpler than the toilette. Thongs of goat, wild-cat, or leopard skin girth the waist, and cloth, which rarely appears, is supplied by the

spoils of the black monkey (*C. Satanas*), or some other "beef." The national costume, however, is a swallow-tail of fan palm, greasy and ochred, thrust through the waist-belt, and when stiff and new, standing bolt upright; when old, it depends limply, resembling the Irish peasant's. A similar fan-like formation, the outspread portion worn like the other, the wrong way, decorates the fore-part. The ornaments are green seed beads, Loango or red porcelains, white "pound-beads"—the latter so called because one pound is equal to one dollar—copper wristlets and anklets, and fibre bandages under the different articulations.

All carry arms, generally spears of fantastic and cruel shape, dwarf battle-axes, and curious lotus-shaped knives. The latter have blades broader than they are long, as is the fashion of the Mpongwe; the sheaths, of fibre or leather, are elaborately decorated, and the "*chique*" is for the scabbard to be so tight that the weapon cannot be drawn for five minutes. There are some trade muskets. Bows and arrows are unknown; yet in war the Fans carry large square shields of elephant hides. The *mbái* or cross-bow peculiar to this people, who seem to have invented, not to have borrowed it, as might be supposed, from Europe, is only carried when sporting or fighting. I need not describe this instrument, whose form is now familiar to England: suffice it to remark, that the *détoite* is simple and ingenious, that the *ébe* or dwarf bolt (a splint of wood) is always poisoned, and that I never saw a good shot made with the weapon. Most men, also, carry a pliable basketful of splints, which, sharpened, poisoned, and placed upon the path of a barefooted enemy, must somewhat discourage pursuit. Though poor at managing canoes—an art to be learned only in infancy—many villagers affect to walk about with a paddle, like the semi-aquatic Krumen.

In the cool of the morning Fitevanga, king of Máyyá<sup>n</sup>, lectured me upon the short and simple annals of the Fans. They are but lately known to fame, having, within the memory of man, crossed the Sierra del Crystal, or West African Ghauts, and dislodged the less warlike Bakele and Mpongwe. In 1842 few were seen upon the head waters of the Gaboon, now they are known to visit the factories at the mouth of the river. They were accompanied in their westward migration by a kindred tribe, the Osheba, and both were, doubtless, driven seawards by the pressure of the inner tribes. These are successively, beginning from the west or seaward, the Bátis, the Okáná, the Yefá, and the Sensoba, the latter being the easternmost known to my negro informants. You will vainly look for these names in

the best of our modern charts. All the lands lying eastward of the Gaboon river-head are purely white. All these races are described as brave, warlike, and hospitable to strangers. I would here draw your attention to a fundamental error in African ethnology, made by Dr. Livingstone, who, deriving all his knowledge from the southern corner of the vast continent, asserts that "*no African tribe ever became extinct.*" The contrary is emphatically the case; nowhere does the selection of species, so to speak, fight more fiercely the battle of life, than in maritime Africa. The tenants of the coast are rarely ancient peoples. Demoralized by the contact of European and Asiatic civilization, and having, like the Turks, less inducement to bar the coast to their inner neighbours, than the latter have to secure free transit for their merchandise to the ocean, the world's highway of commerce, they degenerate and gradually die out. I will instance in the present day the Mpongwe and the Efik, or old Calabar races. During the last half century both notably have declined, and they are in a fair way to become extinct, or to be merged into other tribes, before the year of grace 1900.

The name of this Fan nation deserves correction. The Mpongwe of the Gaboon river know them as Mpángwe, the Europeans as Pauouin, or Paouen—corruptions both. They call themselves Pánwe, Fánwe, and Fán<sup>n</sup>, with a highly nasalized *n*. The plural is Bá-Fán<sup>n</sup>.<sup>\*</sup> The word Fan pronounced after the English fashion would be unintelligible to them. Their tongue, which belongs to the northern or equatorial branch of the great south African family of language, is soft and sweet, a contrast to their harsh voices and *criard* utterance. They are intelligent as regards speech. During my short stay I collected, assisted by Mr. Tippet, a short vocabulary from the chief's son and others. It was subsequently corrected by a comparison with an unpublished MS., the work of the Rev. Mr. Preston, of the A. B. C. F. Mission, an able linguist, who has resided for some time, and seen some queer adventures among the Fans. If you desire it, it is freely offered to you.

After a bath in the muddy Mbokwe I returned to the village, and found it in a state of ferment; the sister of a young warrior had lately been killed and "chopped" by the king of a neighbouring Osheba hamlet, "Sán-Kwí," and the brother was urging his friends to up and arm. All the youths seized their weapons, the huge war-drum, the hollowed base of a tree, was set up in the middle of the street;

\* Fán in their tongue means a man.

preparations for the week's singing and dancing, which inaugurate a campaign, were already in hand, and one man gave earnest of bloodshed by spearing a goat, the property of Mr. Tippet. It being my interest that the peace should be kept till our return from the sources of the Gaboon river, I repaired to the palava house, and lent weight to the advice of my host, who urged these heroes to collect ivory, ebony, and rubber, and not to fight till his stores were full. He concluded by carrying off the goat. After great excitement the warriors subsided into a calm, which, however, was broken two days afterwards by the murder of a villager, the suspected lover of a woman higher up the Mbokwe river; he went to visit her and was at once speared by the "injured husband."

The Fans, like most African tribes, with whom fighting is our fox-hunting, live in a chronic state of ten days war; such is the case even where the slave trade has never been known. Battles, however, are not bloody; after the fall of two or three warriors they are dragged off to be devoured, and their friends disperse. If the whole body cannot be removed, the victors content themselves with a "*gigot*" or two, to make soup. The cannibalism of the Fans is by no means remarkable, limited, as it is, to the consumption of slain enemies; the practice extends sporadically from the Nun to the Kongo, and how much further south I cannot at present say. In the Niger and the Brass the people do not conceal it; in Bonny I have seen all but the act of eating; it is execrated by the old Kalabarese, whilst practised by their Ibo neighbours to the north-west; the Duallas of Camaroons number it among their "country fashions;" and though the Mpongwe eschew even the chimpanzie, the Fans invariably eat their foes.

Still no trace of the practice was seen at Máyyán; this, however, is not caused by its civilization. The Rev. W. M. Walker, and other excellent authorities, agree that it is a rare incident even in the wildest parts, but it is rendered unusual only by want of opportunity. The corpse when brought in is carried to a hut in the outskirts, and is secretly eaten by the men only, the cooking pots being finally broken. No joint of man is ever seen in the settlements. The people shouted with laughter when a certain question was asked. The sick are not devoured, the dead are decently interred, except slaves, who, as usual, are thrown into the forest. The chiefs, stretched at full length and wrapped in a mat, are secretly buried, the object being to prevent some strong fetish or medicine being made by enemies from various parts of the body; in some tribes those of the same family are interred near one another; the commonalty are put singly under

ground. During my peregrinations I never saw even a skull. Mr. Tippet, who had lived three years with this people, only knew three cases of anthropophagy; yet the Fan character has its ferocious side. Prisoners are tortured with horrible ferocity, and children may be seen licking the blood from the ground. It is a curious ethnological consideration, this peculiar development of destructiveness in the African brain; cruelty seems to be with him a necessary of life. All his highest enjoyments are connected with causing pain and inflicting death. His religious rites—how different from the Hindu's!—are ever causelessly bloody. As an instance, take the Efik, or old Calabarese. For two hundred years they have had intercourse with Europeans, who certainly would not encourage these profitless horrors, yet no savages could show such an extent of ferocity as the six thousand wretched remnants of the race. I cannot believe this abnormal cruelty to be the mere result of uncivilization. It appears to me rather the work of an arrested development, which leaves to the man all the bloodthirstiness of the carnivore.

After the palaver had been temporarily settled, I wandered through the settlement and sketched the huts. Our village contains about four hundred souls, and throughout the country the maximum would be four thousand, the minimum a hundred or so. The Fan homes are most like those of the Mpongwe, in fact, after the fashion that begins at Camaroon river; they are not, however, so neat and clean as those of the seaboard. A thatching, whose long eaves form deep verandahs facing towards the one street, surmounts neat walls of split bamboo (*Pirni-fera*), planted upon raised platforms of earth. The usual two doors make the hut a thoroughfare, through which no one hesitates to pass; and windows being absent the ceiling is painted like coal tar by soot. The walls are garnished with weapons and nets; in making these they are equally expert; and the furniture consists of mats, cooking utensils, logs of wood for pillows and seats, and dwarf stools cut out of a solid block. The only illumination is by a torch, such as the Mpongwe use, a yard of acacia gum mixed with and bound up in dried plantation leaves. The sexes are not separated; but the men, as in Unyamwezi, to quote no other place, are fond of their clubs, whilst the women are rarely allowed to be idle in the house. The latter must fetch water, nurse the baby, and cook, while the former talk, smoke, and doze. The number of the children makes the hut contrast favourably with the dreary home of the debauched Mpongwe, who puts no question provided his wife presents him with a child.

The dietary of these barbarians would astonish the half-starved sons of civilization. When shall we realize the fact, that the great thing needful to the prosperity of England is, not alm-houses, and hospitals, and private charities, but the establishment, advocated by Mr. Carlyle, of a regular and efficient emigration! The crassest ignorance only prevents the listless pauper, the frozen out mechanic, and the wretched agricultural labourer from quitting a scene of misery, and from finding scattered over Earth's surface spots where the memory of privations endured in the hole which he calls his home would make his exile a paradise. We expect from a national system of emigration, our present great want, not the pilgrimage of a few solitary hands who—Nostalgia is a more common disease than men suppose—are ever pining for the past, but the exodus of little villages, which, like those of the Hebrides in the last century, bore with them to the New World their lares and penates, their wives, families, and friends.

Few of the Fans lack, once a day, fish, fowl, or flesh of dogs or goats, mutton, or game; many eat it twice, and they have a name for the craving felt after a short abstinence from animal food. Cattle is as yet unknown; the woods, however, supply the wild buffalo in numbers. The banana, planted with a careless hand, affords the staff of life, besides thatch, fuel, and fibre for nets and lines. The palm tree gives building materials, oil, and wine; milk is unknown; butter, however, is produced by the "Nje," a towering butyraceous tree, differing from that which bears the Shea-nut; and when bread is wanted, maize rises almost spontaneously. The bush is cut at the end, and burned before the beginning of the rains, leaving the land ready for agriculture almost without using the hoe. In the "middle dries," from June to September, the villagers sally forth to hunt the elephants, whose spoils bring various luxuries from the coast. They are even gourmands. Lately, before my arrival, all the people had turned out for the Ndiká season, during which they will not do anything else but gather. The "Ndiká" is the fruit of a wild mango tree (*M. gabonensis*), and forms the "one sauce" of the Fans. The kernels extracted from the stones are roasted like coffee, pounded and poured into a mould of basket work lined with plantain leaves. This cheese is scraped and added to boiling meat and vegetables; it forms a pleasant relish for the tasteless plantain. It sells for half a dollar at the factories, and the French export it to adulterate chocolate, which in appearance it somewhat resembles. I am ready to supply you with a specimen whenever you indent upon me.

After the daily siesta, which lasted till three p.m., Mr. Tippet begged me to put in an appearance, as a solemn dance, in which the king's eldest daughter joined, was being performed in honour of the white visitor. A chair was placed for me in the verandah, and I proceeded to the exterior study of Fan womanhood. Whilst the men are thin and *élancés*, their partners are usually short and stunt.

"Her stature tall, I hate a dumpy woman," is a point upon which most of us agree with his lordship. This peculiar breadth of face and person probably result from hard work and good fare. I could not bring myself to admire Gondebiza, the princess, although she was in the height of Fan fashion. What is grotesque in one appears ugly in the other sex. The king's daughter was married, fat, and thirty; her charms were on the wane; and the system of circles composing her *personnel* had a tremulous and a gravitating tendency. She danced with all her might, and her countenance preserved a great seriousness. Her dress consisted of leaves covering the hair-horns, a pigtail lashed with brass wire, various necklaces of large red and white, and pink and blue beads; a leaf confined to the upper arm by a string, and heavy brass and copper wristlets and anklets; the *parure* of the great in these lands. The rest of the toilet was a dwarf swallow tail, and an apron of greasy and reddened tree-bark, kept in position by five lines of cowries acting as cestus. The body was also modestly invested in a thin pattern of tattoo, and a gauzework of grease and canewood. The other performers were, of course, less brilliantly equipped. All, however, had rings on their fingers and toes, the arms, legs, and ankles. A common decoration was a bunch of seven or eight long ringlets, not unlike the *queue de rat*, still affected by the old-fashioned English women, but prolonged to the bosom by stringings of alternate white and red beads; others limited this ornament to two tails depending from the temples, at the parts where horns should grow. Amongst them all I saw but one well formed bosom. Many had faces sufficiently piquant. The figure, however, though full, wanted firmness. The men wore red feathers, but carried no arms. Each had his Ndese garters and armlets, like the Arab's "hibá's," of plaited palm-fibre, tightened by little brass cross-bars.

The form of dance was a circular procession round the princess, who agitated herself in the centre; it reminded me much of Mr. Catlin. To the sound of o-o-o-oh, all clapped hands, stamped, and shuffled forwards, moving the body from the hips downwards, whilst she alone was stationary, and smileless as a French demoiselle,

in her favourite enjoyment. At times, when the king condescended to "show his agility," the uproar became deafening. The orchestra consisted of two men sitting opposite each other; one performed on a caisson, a log of hollowed wood, with an upper slit; and the other used the national Hãnjás, the prototype of the *harmonium*. It is made of seven or eight hard sticks, pinned with bamboo splints to transverse stems of plantain, reposing upon the ground. Like the former instrument, it is thumped upon by things like tent-pegs. The grande-caisse, or large drum, four feet tall, skin-covered and fancifully carved, stood at some distance. Highly gratified by the honour, but somewhat overpowered by the presence, and already feeling that awful scourge the sand-fly, I retired, after an hour's review, leaving the dance to endure till midnight.

The rest of my day and the week following were devoted to the study of this quaint people, and these are the results. Those who have dealings with the Fans, universally prefer them for honesty and manliness to the Mpongwe, and the other coast races. They have not had time to be thoroughly corrupted; to lose all the lesser, without acquiring any of the greater virtues. Chastity is still known amongst them. The marriage tie has some significance, and they will fight about women. It is an insult to call a Fan liar or coward, and he waxes wroth if his mother be abused. Like all tribes in West Africa, they are but moderately brave. They are fond of intoxication, but not yet broken to ardent spirits. I have seen a man rolling upon the ground and licking the yellow clayey earth, like one in the convulsions of death-thirst; this was the effect of a *glass* of trade rum. They would willingly traffic for salt and beads. *The wretched custom of the coast—the White coast—is to supply vile alcohols, arms, and ammunition. How men who read their bibles and attend their chapels regularly, can reconcile this abomination to their consciences, I cannot say. May the day come, when unanimity will enable the West African merchants to abstain from living upon the lives of those who pour wealth into their coffers!!*

The Fan plant their own tobacco and care little for the stuff imported. They also manufacture their pipe bowls, and are not ignorant of the use of diamba-hashistra. They will suck salt as children do lollipops, but they care little for sugar. They breakfast (kidiáshe) at six A.M., dine (dómos) at noon, sup (gogáshe) at sunset, and eat if they can all day. They are good huntsmen, who fear not the elephant (nyok), the hippopotamus (nyok á mádzun), or the gorilla

(njé). They are cunning workmen in iron, which is their wealth. Their money is a bundle of dwarf rods shaped like horse-fleams, a coinage familiar to old travellers in West Africa, and of this Spartan currency 10=6d. The usual trade medium is a brass rod, of which 2=1 franc, and of the copper 3=2 francs. Llaki, or witchcraft, has not much power over them. In Africa, however, as in Australia, no man, however old, dies a natural death; his friends will certainly find a supernatural cause for it. The general salutation of the Fans is Neboláne, and the reply Am. The nation is divided, as usual, into many ayons or tribes, who mostly occupy different locations. The principal names in the vicinity visited by me are :

Máyyán.	Lálá.	Sánikiya.	Sákulá.
Esobá.	Esánvímá.	Esonzel.	Wámási.

The names of the men whom I met were :

Nál.	Ngoo.	Titevanga.	Jembestroná.
Mábuná.	Yembe.	Njèmbekona.	Uwá.

The names of the women are :

Aháde.	Nyendongo.	Gondebiza
Menalenguma.	Abome.	Nyágondayámá.

They have their own names for the neighbouring tribes and places, *e. g.*, the Mpongwe are called Bayok, the Bakeli are Ngom, and the Skekyáni Besek, whilst the Gaboon river is called Aboká. They have no vocables corresponding with our distinctive names of week days, months, or years. "Amos" is any day, opposed to alusha, a night. Suká or sukásuá is the rainy season. Isob the little Cries; oyon, the long Dries, *alias* a year. The Eugon, or moon, is of course used to express a month. Mwásá is yesterday. Emm, to-day. Kirige, to-morrow. Ozán, the day after to-morrow. The only specimen of the language that I can now find time to quote, is its numeralogy. It need hardly, however, be remarked to the Ethno-Anthropological Society of London how instructive and how significant numbers are.

1, Foá (with strong guttural aspirate like the Arabic).		
2, Be.	6, Sám.	10, Abom.
3, Láre.	7, Sàngwá.	11, Abom ná fon.
4, Nne.	8, Wám.	100, Kámá.
5, Tánu.	9, Ebú.	

On the 14th of April, I went, in company with Mr. Tippet and his wives, to the head waters of the Imbokwe river. After descending the stream for a short distance, we turned into the Sondo creek, one

of its northern influents, and presently, after losing sight of mangrove for the first time, we arrived at the village of Takanjok. There, having obtained carriers, we marched through a dense bush cut by streamlets and a few plantations. After a six miles walk over stiff wet clay, we bivouacked for the night in a tall but thin forest. In early morning, a tornado from the north-east broke over us, a curious crash aroused me, and I found that the upper half of a tree had fallen alongside of me, grazing my hammock. When the rain subsided, we ascended the little hill Beká, where, according to the guides, Nkomo and Imbokwe, the two main forks of the Gaboon arise, and on the same evening, after thirteen miles work, of which nine were by water, we reached home at Mayyá". Our return down the river was enlivened by glimpses of far blue hill rising in lumpy and detached masses to the east. It is probably a subrange of the Sierra del Crystal, which native travellers described to me as a broken line of rocky and barren acicular mountains—tall, gravelly, waterless, and lying about three days journey beyond the wooded hills. Early on the morning of Thursday, 17th April, the *Eliza* was lying off Mr. Walker's factory, and I was received with the usual hospitality by Mr. Hogg, then in charge.

I will conclude this brief record of "first impressions amongst the Fans," with tendering my best thanks to that gentleman for his many little friendly offices, without which travelling in these regions is rather a toil than a pleasure.

P.S.—You will bear in mind that the Fans whom I visited were a comparatively civilized race, who have probably learned to conceal the customs which they have found distasteful to the civilized man. In the remoter districts they may still be determined cannibals. Before long I hope to pronounce an opinion on that point.

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EXTRACTS FROM A LECTURE DELIVERED AT MUNICH, 1858,  
ON THE DIFFERENCE BETWEEN MAN AND BRUTES.

By Dr. Th. BISCHOFF.

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IN a primitive and savage state man scarcely believes that there is much difference between him and the brute, especially if they much resemble him. Travellers relate that the Negroes in Guinea, and the natives of Java and Sumatra, look upon the orang-outang and chim-

panzee as men, who do not speak that they may not be made to work.

Advancing civilization leads to another extreme. The differences now appear to man so great that he considers himself to be entirely separated from the brute creation, which he thinks are only existing for his sole use.

Natural science, however, proffers some doubts as to this exclusiveness of man. It cannot admit that every being has only been created for man's good pleasure, but that each creature has an object apart and is perfect in itself. When in the middle of the last century the anthropomorphous apes were introduced in Europe, the greatest naturalists of that time seemed greatly embarrassed to establish the physical characters which distinguish these apes from man, and it appeared to result from their investigations that man was connected with the brute creation by an imperceptible transition.

That was the time when the whole creation was considered as an uninterrupted chain of beings, and it was but natural to suppose that man formed the last link. It was also observed that the human embryo passed through various stages; that it was first an infusorium, then a mollusc, then an insect, a fish, reptile, bird, and a mammal. It was then said, that it is a mere insufferable pride of man considering himself to be anything more or higher than an animal.

This theory was not long maintained. A close investigation proved that, despite of the great resemblance of the apes to man, there prevail physical differences as great as those which enable us to distinguish genera and species. The theory of the chain of beings was also upset. True though it be that many types present a progressive development, there are gaps in nature which are unsurmountable. Again the theory of the passing of the human embryo through the stages of the lower animals was shown to be a general law of development common to all vertebrate animals, according to which they all resemble each other in the first stage of their formation, but from which they become differently formed, sometimes owing to an arrest of development, and even by retrogression.

Though it is not my intention to treat this question from a psychological, but rather from an anatomico-physiological point of view, it cannot be denied that the psychological phenomena which distinguish man are the most important, however obscure these phenomena may be.

It is impossible to deny to animals qualitatively and quantitatively many mental faculties as we find them in man. They possess con-

sciousness. They feel, think, and judge; they possess a will which determines their actions and motions. Animals possess attachment; they are grateful, obedient, good-natured; and, again, false, treacherous, disobedient, revengeful, jealous, etc. Their actions frequently evince deliberation and memory. It is vain to derive such actions from so-called instinct which unconsciously compels them so to act.

But though we cannot deny to animals consciousness, we assert that man alone possesses self-consciousness, that is, the capacity of meditating on himself and his connection with the rest of the creation. I need not point out how from this faculty arise the most important relations of man. I would merely assert that no animal—dog, elephant, orang outang, or chimpanzee—ever exhibited a trace of such self-meditation, either in its own existence or its relation to creation, which faculty is the chief source of the action of man, and which character belongs to every human being not in a morbid or degenerate state.

Vain have been the attempts to refute this assertion by maintaining that the mode by which man and brutes arrive at knowledge is the same in both, namely, by experience, and that it is only a quantitative difference. The way by which both arrive at knowledge may be the same, but the motives which lead to this way are generically distinct, and arise, not from the quantitatively, but the qualitatively different psychical nature of man. The brute gathers experience accidentally. Man searches for experience, and applies his own and other persons' experience for a definite object, and is induced to do so by motives which do not exist for the animal.

Nor is it possible to weaken this specifically higher character of man by shewing that there are human beings who exhibit so little or nothing of this faculty, that they stand in this respect beneath many animals.

Thus microcephali, idiots, and crétins have been adduced as instances. The error is manifest that these unfortunate beings can scarcely be called men: they possess the human shape without being human beings in the strict sense. It is a rule of logic that two things should be compared with each other in their normal condition, and not one thing in a perfect and the other in a mutilated state.

Botocudos, New Zealanders, etc., have also been instanced as scarcely possessing the sagacity of many animals; and instances have been quoted of so-called wild men who, lost in early youth in forests and deserts, grew up like beasts, and exhibited no trace of self-consciousness.

With regard to the most degraded savages, intelligent travellers have always found among them a belief (however crude) in some superior being\* as the cause of some natural phenomena. Moreover, the error is generally committed of viewing the actual condition of these savages, and not their capacity. Now, many individuals of so-called civilized nations would not resemble them if we were to apply to them the standard of such men as Aristotle, Newton, Shakspeare, etc. It is the possibility of the development of self-consciousness which decides the human character.

Ancient physiologists have laid down the maxim that the human brain exceeds in size and weight that of any other animal. This is true in by far the greater number of cases. Whilst the human brain is rarely less than two pounds or 1000 grammes, and varies generally between two to three, and even four pounds, the weight of the brain of some of the largest quadrupeds—such as the ox, horse, camel, etc.—is rarely much above a pound, and considerably less in the bear, lion, etc.

In the elephant, however, the whale, etc., it was found that they possess a brain absolutely heavier than the human brain. That of the elephant has been rated at from eight to ten pound, of the whale four to five pounds.

It was then laid down as a law that the brain of man exceeded that of any other creature, when considered in proportion to the rest of the body.

This axiom again holds good in most cases; for while the human brain in proportion to the body is on the average as 1 : 35 to 37, it was found in the whale as 1 : 3,300; in the elephant, 1 : 500; in the ox, 1 : 1000 to 800; in the horse, 1 : 700 to 400; bear, 1 : 265; dog, 1 : 250.

Further investigations have, however, invalidated the general maxim, as in some of the smaller animals, both in birds and mammals, the weight of the brain in proportion to the rest of the body exceeds that of the human brain.

In the canary bird and greenfinch it is about 1 : 14. In some small apes, also, the brain is, relatively to the body, heavier than in man. Thus, in the sajou, 1 : 13; saimiri, 1 : 24, &c.

\* [As regards this often quoted assertion that all savages, without exception, have some kind of belief in a God and a future life, Dr. Lang, *Aborig. of Australia*, says, "They have no idea of a superior divinity, no objects of worship, no idols nor temples, no sacrifices, nothing whatever in the shape of religion to distinguish them from the beasts." This statement has been confirmed by Sir Charles Nicholson, V.P.A.S.L. Dr. Mouat has made similar observations respecting the Andaman islanders.—ED.]

Again, the relative weight of the brain in different animals, compared with their psychical qualities, is against the above axiom, in as much as, for instance, the relative weight of the brain of the ass is double that of the horse, psychically so superior to the donkey.

Comparative anatomy has, however, proved that no animal possesses such a development of the hemisphere and the grey matter as man.

Comparative anatomy has also shown that no animal brain exhibits so numerous, deep, and *asymmetric* convolutions in both hemispheres as that of man.

In some cetacea the convolutions are more numerous, but the sulci are scarcely a few lines in depth, whilst in the human brain they descend in many places above an inch. In some carnivora the sulci are deep, but much less numerous, and always strictly symmetrical on both hemispheres. This applies also to the apes and ruminants, in which the sulci are both less numerous and deep than in man.

There can be no doubt that the arrangement is for the purpose of increasing the surface of the brain. If in the given space of the cranial cavity the brain is to have a larger surface than can be afforded by the inner part only of the skull, the brain mass must necessarily be arranged in folds. These convolutions, and the grey mass of which they are composed, and which in psychological respect is the active portion of the nervous mass, are more developed in man than in any other creature. It would then follow that the psychical status of man corresponds with the greater development of the hemispheres, and especially on the extent of their surface, caused by the number and depth of the convolutions.

*The Senses.*—There is another character which distinguishes man from the brute, besides the higher cerebral development—the connection of man with the external world by the variety and intensity of his organs of sense.

Though individual animals excel man in the acuteness of some sense, there is none in which all the senses are capable of an equal development. This holds especially good in respect of the organ of touch, in which he by far excels all other creatures. Considering, now, that the development of all our faculties is only effected by sensible impressions, and all our knowledge derived by the medium of our senses, the advantage which man possesses in this respect above animals is sufficiently manifest.

*Language.* The possession of the power of expressing his thoughts by articulate sounds has ever been considered as the distinctive character of man, it being met with among all human beings, and

absent in all animals. The reason why animals do not speak has generally been attributed to a different organization of the larynx and other appendages. Thus Camper considered the presence of two pouches near the larynx of the orang-outang as an impediment of speech. But all anatomical disquisitions on this subject have failed to explain the absence of articulate language in some animals on merely anatomical grounds. Moreover it is well known that some animals are capable of uttering articulate sounds. Leibnitz speaks of a dog in Meissen which could articulate ninety words.

It is quite clear that language in man must have been the consequence of the necessity of intercommunication with his fellow men, and must have sprung from the psychical nature of man. The necessity of intercommunication between animals being limited to physical desires, such as food, protection, and sexual intercourse, are sufficiently expressed by inarticulate sounds.

The dispute about the origin of language, whether it was a gift of nature or the invention of man, may be decided in this way, that man owes his capacity of speaking to nature, but its application to his own invention. Hence the same notion and the same object is designated in different languages by different words, unless congruent circumstances led to the application of similar sounds.

*Upright Stature.*—The erect stature of man is the distinctive character mostly dwelt upon by physiologists.

It is true that some plantigrades, as bears, etc., and some apes, can assume for a limited time an erect posture, but this is only exceptionally done; but man in the most degraded state always walks upright, which is the necessary consequence of the structure of his skeleton and the muscles connected with it. . . .

The large and heavy head of man, about one-fourteenth of his whole weight, is so articulated upon the vertebral column that it is balanced upon it. . . .

The legs are so constructed that they perfectly support the body when erect, whilst in a horizontal position they would be very cumbersome. The hand is so clearly an organ of prehension and touch, that it seems unfit to serve as a mere support.

The proportions of the various parts of the human body exhibit a variety and a capacity of development not to be found in any animal. Man alone can stand, walk, run, spring, climb, swim, ride, drive, sit, or lie on his back for a long time. In some of these motions man is excelled by animals, which however are mostly limited to some particular kinds of locomotion. Our jugglers, rope

dancers, contortionists, etc., prove of what a variety of motions man is capable.

Man possesses, in addition, organs of assimilation such as no animal enjoys, owing to the structure of his teeth, the alimentary canal, etc. Indeed, there is no animal in which all the three species of teeth are found in such an uninterrupted proportion as in man. The possibility of the distribution of mankind on all parts of the globe is owing to the pliability of man's organization. But few animals can support, like man, the differences in climate, etc. It is also remarkable that the creatures approaching nearest to man, namely, the orangs and chimpanzes, are so far behind man in this respect, that they soon perish when removed from their native spot.

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### NOTES ON THE ANTIQUITY OF MAN.

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WHEN did man make his first appearance on our globe?

Was man a witness of the last change in the surface of the earth, and of the inundations by which the gravel called diluvium has been deposited? And, if so, must he not have been the contemporary of many of the extinct gigantic animals?

No one doubts that the physical condition of the globe we inhabit, and the history of mankind, are legitimate subjects of human inquiry; and yet frequently where these questions have been raised there has been a great repugnance to discuss them on their own merits, from a vague fear that the facts elicited would clash against popular opinion.

The evidence in favour of a much greater antiquity of the human race than was hitherto allowed has been gradually accumulating. The facts which are everywhere brought to light, though perhaps not as yet universally acknowledged, are sufficiently pregnant, and the deductions from them too important to be any longer ignored; they must be thoroughly sifted, and either affirmed, or, if possible, refuted.

The present paper is a summary of the leading facts and opinions under discussion.

There is a circumstance connected with our subject which appears rather curious. While individuals or families are most anxious to trace their pedigree as far back as possible, and take pride in the antiquity of their descent, and while nations are equally tenacious of their remote antiquity, humanity, in the aggregate, prefers, in relation

to the existence of the rest of animals, to be considered as a modern creation, not dating further back than sixty centuries.

An intense egotism may, perhaps, be at the bottom of this apparent paradox. Man, in his pride, is so much in the habit of considering himself as the last link, as the epitome of the vegetable and animal world, in short as the lord of the creation, that he conceives it beneath his dignity to appear upon the scene until every thing had been duly prepared for his reception.

*Chronological Data.*—The Book of Genesis has formed the basis of our common chronology on the assumption that it gives the true epoch of the creation of the world and of man; yet the biblical texts differ. Thus, according to the Alexandrian version, 2,262 years are reckoned from the Creation to the Deluge. The Hebrew account has 1,656, and the Samaritan text 1,307 years.

Hence chronological computators greatly differ, and Desvignoles (*Chronology of Sacred History*), has collected above two hundred different calculations, varying from 3,483, the shortest, to 6,984, the longest period said to have elapsed between the Creation of the world and the commencement of our present era, so that the difference amounts to above 3,000 years.

That the Hebrew chronology falls infinitely short in reference to the creation of our globe is almost universally admitted even by those who contend for the consistency of Geology with Sacred History; hence the six days of creation are by many of these reconcilers considered as periods of time of indefinite length.

*Hindoo Chronology.*—According to the Indian mythology the world is to last four ages (yugs), three of which have already passed. The last, or the kali-yuga, commenced, according to Lepsius, in April 1302 B.C.

Conarda, a Cashmerian king, is supposed to have reigned 2448 B.C., and the era of king Vicramadyta is fixed at 58 B.C.

The pundits, by extending the Chaldean astrological cycle, make it 4,320,000 years.

*Chaldaean Chronology.*—The 36 decans of the zodiac multiplied by the 12 months of the year yielded the mystic number 432. The grand year of astronomy, or the time supposed by the Chaldeans to be required for the sun, fixed stars, etc., to return to the same celestial starting point, was first 25,000, then 36,000, and at last 432,000 years, agreeing with the supposed duration of ten Græco-Chaldæan generations. The deluge terminated the cycle.

*Chinese Chronology.*—Like the early history of every ancient people the Chinese possess also their fabulous and semi-historical periods.

Ante-historical periods (Chine Panthier).

Pankon, the first symbolical man, followed by the three Hoangs. 1st, reign of the sky; 2nd, reign of the earth; 3rd, reign of man. They are comprehended in a grand cyclic period of 129,000 years, composed of twelve parts, called conjunctions, each of 10,800 years. Semi-historical period commences with Fou-pi, first emperor, about 3,468 B.C. Several of his descendants are named who have made discoveries in arts.

The historical period commences with the first king Hoang-ti, about 2637 B.C., falling, according to Lepsius' computation, during the pyramidal period of Egypt. It is certain that art and science flourished in China at a remote period, and the Chinese possessed a high degree of civilization while the Hebrews led yet, under the patriarchs, a nomadic life.

*Egyptian Chronology.*—Manetho, the Egyptian priest's system of chronology, according to recent investigations, chiefly of Lepsius, is as follows:—

Cyclic periods anterior to Menes.

Divine dynasties—19 gods reigned	13,870 Julian years.
80 demigods	3,650

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17,520

Ante-historical dynasties	-	320
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20,840 years.

Advent of Menes, the first king, commencement of historical period, 30 dynasties, 3893 B.C.

Lesueur places the beginning of the Egyptian kingdom 5773 B.C., while Bunsen assumes the 3,643 B.C. In either case, the history of Egypt reaches further back than that of any other nation. Brugsh is said to have brought from Egypt an old manuscript upon leather 4000 years old. How many thousand years have passed before the Egyptians could have become a mighty nation, and have acquired by mere self-tuition—for we have no record that they have learned anything from any other nation—the arts and sciences requisite for the conception and execution of the stupendous monuments and works of art still extant, cannot be determined.

Menes, of the ancient city of This, built the capital Memphis, between the Nile and the Lybian desert. But before Memphis was built there existed already the important cities of Thebes and This.

*Language.*—Much stronger than the evidence obtained from the chronology of different nations is that derived from the evolution, progress, and development of human language. Whatever view we adopt, it amounts almost to a physical impossibility that a grammatically constructed language should have issued from the mouth of the primitive man. For a very long period language was only transmitted from generation to generation by tradition, and an immense time must have elapsed before the living and dead languages, which are proved to have originated from a common stock, could have acquired a substantive form.

Bunsen, who, with many others, assumes one primitive language, observes,—

“Philosophical inquiry shows the monosyllabic or particle language, as preserved in the ancient Chinese, must be supposed, theoretically, to have preceded the organic language, and either each language separately must once have been like the Chinese, or the Chinese itself is the wreck of that primitive idiom from which all organic languages have physically descended.”

Arguing from such premises, Bunsen considers that, both from tradition and facts, the age of mankind cannot be less than 20,000 years, reckoning 10,000 years from Adam to Noah, and 10,000 years from Noah to the present era.

The question then arises, granting that the Chinese presents the primitive form does it present the primitive idiom? May it not, and has it not, been preceded by languages far more simple in form, and, if so, must not a long period have necessarily elapsed before it arrived at its present systematic form?

Again, assuming that the cradle of humanity was in a confined spot in the east, and that all the nations inhabiting the earth have proceeded from the same protoplasts, how many thousands of years have they required to spread upon the surface of the globe? Have not the first navigators found human beings every where? And again, what an immense period must have elapsed before the typical forms of the various races, supposing them to be the result of external influences, can have acquired that high degree of firmness and permanent development by which they are distinguished.

The naturally slow progress of civilization among primitive people deprived of experience to guide their steps, and forced, as it were, to grope in the dark, like a blind man, and to feel their ground, render the calculation to fix the age of mankind nearly impossible.

It belongs to Egyptologists and chronologists to separate the fabu-

lous from the probability of these computations, they are adduced merely as collateral arguments, which may be taken for what they are worth.

Neither shall we dwell upon the argument that the fragment of pottery found by Mr. Horner at a depth of thirty-nine feet from the surface of the ground, consisting of true Nile sediment, must be held as a record of the existence of man 13,371 years before A.D., reckoning the rate of increase in that locality at three inches and a half in a century.

This much, however, is undoubted, that according to the earliest record the Egyptians possessed a degree of civilization superior even to that of many subsequent centuries, a result which is certainly not compatible with the short time said to have elapsed between the Deluge and the time of the Pharaohs. This applies also to the early civilization of the Chinese, the Assyrians, and the Hindoos.

These perplexing considerations have not escaped the attention of devout believers in scripture authority. They have therefore been hard at work to reconcile the apparent conflict between sacred history and profane facts. Thus, among other theories, has been engendered the Præ-Adamite hypothesis, which is too curious to be omitted, and from which it will be observed that the Antediluvian theory is by no means a modern conceit.

In 1655 Izaak Peregre, a Calvinist scholar of Bordeaux, published a work entitled *Præ-Adamite*, in which he endeavours to prove, from certain passages in Genesis and the Epistles of St. Paul, that Adam and Eve were not the first human beings upon the earth. That there were in fact two separate creations of man, the first of which took place on the sixth day, along with the beasts of the earth, and in the same mode, namely, by the Creator merely bidding the earth to produce them. This he contends was the origin of the Gentiles, who spread upon the whole globe and peopled the earth. He further observes that the people of the new-world could not have been the descendants of Adam, separated as the new continent was from the old, they were obviously the descendants of the Præ-Adamites.

A long time, that is to say many thousand years after the first creation, God created Adam and Eve, but in a different manner; for God made man himself of the dust of the earth, and breathed into his nostrils the breath of life, and man became a living soul. In the first creation man and woman were created at once; in the second, woman was made out of the rib of man. In the second creation the persons are named, no special names are given in the first creation. From several other passages, specially from some verses from Paul's Epistles

to the Romans, as well as from the chronology of the Egyptians, Hindoos, etc., he arrives at the conclusion that human beings had existed long before Adam was created.

Peyrere's theory met with much opposition. The Paris Parliament caused his work to be publicly burned. The Inquisition took hold of him and forced him to abjure both his Præ-Adamite heresy and his Calvinism. He died in a convent in 1676.

There is no doubt that poor Peyrere was much in advance of his times, and therefore fair game for persecution. That this spirit is not quite extinct among us is proved by the fact that an estimable author, who recently published a similar work under the title of *Genesis of the Earth and of Man*, has not ventured to affix his name to his book. This writer also contends that the Scriptures afford abundant evidence in favour of the existence of Præ-Adamites, and that physical, historical, and linguistic facts confirm this view. It is, however, not a little singular that though this author travels pretty nearly over the same ground as Peyrere, and even quotes some of the same passages, Peyrere's name is never mentioned. One thing seems certain, that science can never be advanced by reconciliation theories.

Leaving now the fields of speculation and religious belief, we must try whether the antiquity of man may not be legitimately deduced from actual phenomena. The records of the living world lie after all in the hidden crust of the earth, every stratum is a page in the book of nature, and tells its own tale of the extinct species of plants and animals. To Geology, then, we must chiefly look for a key to solve approximatively the enigma, so that facts may support or displace theory, and knowledge may be substituted for mere speculation and belief.

*Discovery of Fossil Quadrumana.*—The great Cuvier, as is well known, was not only of opinion that the date of man's advent upon the globe did not much exceed the common computation of 6,000 years, but that the creation of the simian tribes, so nearly resembling the human organization, was either coetaneous, or but little anterior to that of man. Hence his dictum that human fossils did not exist, and his disbelief that fossil bones of quadrumana would be found. Cuvier's name was a tower of strength, and the circumstance that up to his death no bones of quadrumanous animals had been found in a fossil state seemed to confirm his opinion, and was generally considered as a fundamental fact.

The grass, however, had not long grown on the grave of Cuvier, when his own countryman, Ed. Lartet, discovered in 1836, at Sansan,

in the South of France, in fresh-water strata of the miocene tertiary period, a fossil monkey of the tailless or Gibbon tribe (*Pliopithecus antiquus*). Mr. Lartet, moreover, very recently communicated to the French Academy the finding of a new species of anthropoid monkey by M. Fontan, exhumed from a bank of marley clay at Saint Gaudens (Haute Garonne). The new fossil monkey appears to have surpassed in height living adult chimpanzees. M. Lartet proposed to call it *Dryopithecus Fontani* (Fontani's tree-monkey), as, like the Gibbon, it appears to have chiefly lived on trees. Later evidences, possibly referable to the same species, have been found at Eppelsheim, in Germany.

It is not a little curious that discoveries in one direction, when once made, either succeed each other rapidly, or are even made simultaneously. About the same time as Lartet discovered his fossil monkey in France, quadrumanous fossils were discovered in India by Messrs. Baker and Drummond in the lower range of the Himalayan mountains, where subsequently other fossils of the same kind were found and described by Dr. Falconer and Captain Cautley. They were found in the tertiary strata of conglomerate sand, marl, and clay. In Brazil Dr. Lund discovered, in 1837, similar fossils peculiar to America, and of a species now extinct. A fossil monkey, called by Professor Owen *Macacus Pliocenus*, from the stratum in which it was embedded, was found, in 1845, on the banks of the Thames at Gray's, in Essex.

A great breach having thus been effected in the master's theory, rendering the discovery of human fossils, at all events, less improbable, Cuvier's adherents became seriously alarmed, and a determined stand was and is still being made against anything presented in the shape of a human fossil.

We shall now endeavour to give a short *resumé* of the evidence as far as it goes in favour of the existence of human fossils, far from pretending that the evidence is sufficiently satisfactory to enable us to pronounce a decided judgment.

*Fossil Man.*—The belief in the existence of giants, founded as it was on the Scripture text, "There were giants on the earth in those days," (*Genesis* vi, 4), was formerly universal, and the finding of fossil bones of gigantic animals was well calculated to sustain that belief.

Thus we read that in 1577 a tremendous storm passed over the convent Reyden, near Lucerne; large oaks were torn up by the roots, and heaps of bones were found, which Dr. Plater, of Basle, declared to be the bones of an antediluvian giant nineteen feet high.

These bones are yet preserved in the Museum of Lucerne, and no person doubted at the time that they were the bones of a giant.

In 1613 a French surgeon, Mazurier, pretended to have found near Chaumont, in the South of France, a brick sepulchre bearing the inscription, *Teutobochus Rex*. This celebrated Teutonic king was defeated and taken prisoner by Marius at the great battle of Aquæ Sextiæ (Aix). The Romans say of him that his head was seen above the standards, and that he was so agile that he could leap over six horses. Taken prisoner about 102 B.C., he slumbered peacefully for seventeen centuries, when he rose again as the king of fossil giants. The skeleton is described as having been twenty-five and a half feet in length, breadth of the chest ten feet, with a skull five feet in diameter. These bones are now recognized to have belonged to the Mastodon *Angustidens*.

Nor must we wonder at the credulity then prevalent, when we recollect that comparative anatomy was at that time almost an unknown science, so that even the great Leibnitz formed, in 1663, of the mammoth bones found by Otto Guerike, the inventor of the air-pump, a biped skeleton with a large horn upon the forehead which he called the fossil unicorn (*Unicornu fossile*).

But the most celebrated of all alleged human fossils was that found by Professor Scheuchzer, of Zurich, in 1726, in a stone quarry of Ceningen. This was the famous "Homo diluvii testis." Scheuchzer says of it, "There may still be seen in this rare relic of the accursed race of the primitive world, the circumference of the frontal bone, the orbits of the eye, the ethmoid bone, a portion of the nose, sixteen vertebræ, the first rib covered with petrified skin, and some vestiges of the liver," and he exclaims:

"Melancholy skeleton of an old sinner,  
Convert the hearts of modern reprobates."

There is, however, one thing which perplexes Scheuchzer. What has become of the occiput? Either, he explains, the quarrymen of Ceningen have broken it off, or, *carcharus quidam*, some dog-fish, has, with its sharp teeth, bitten it right off in the deluge.

It is now known that Scheuchzer's fossil is the remains of a gigantic salamander, which in honour of the discoverer has been termed *Andrias Schouchzeri*. A small living specimen of an allied species, the *Cryptobranchus Japonica*, is now in the gardens of the Zoological Society. The round mouth of the fossil animal appeared to the Zurich professor to be the remains of a human forehead.

The imagined existence of antediluvian giants and fossil man was thus seemingly disposed of by the progress of comparative anatomy. But an idea once engendered in the human brain bears a charmed life, and though it may remain dormant for a long period, a revival is sure to take place; and thus we find the question of the fossil man is now more agitated than ever.

The term fossil is at present used synonymously with organic remains, though it is well known that in many fossils all organic matter has disappeared and been replaced by mineral substances.

The usual test applied to judge of the age of bones consists in observing the relative proportion of animal and vegetable matter present; if a certain proportion of animal matter be still present, the bone will neither be brittle, nor will it adhere to the tongue and lips; but if the animal matter has disappeared, and nothing but earthy matter remains, the bone will be both brittle and adhesive. Again, by placing the bone into dilute hydro-chloric acid, the recent bone retains, after the removal of the earthy matter, its form in a flexible state, while the true fossil bone will, similarly treated, be reduced to a spongy mass, and dissolve with effervescence.

This is still considered an *experimentum crucis* in relation to the age of organic remains. But is the test infallible and decisive? It appears not.

It is now ascertained that bones of recent animals, introduced into old deposits, may assume, in a comparatively short time, the condition of the bones of extinct animals, while, on the other hand, undoubted fossil bones of extinct animals may, under certain conditions, present a large proportion of animal matter.

Thus we read (Meigs' *Description of a Deformed Skull*, 1859), that a piece of an ancient Burgundian skull, and a fragment of the skull of an ancient Roman, found in a tomb between Cumæ and the ruins of Baiæ, after being subjected to an analytical process, were found to consist almost wholly of earthy matter. The animal matter had almost entirely disappeared. These bones were dissolved in a much less time than the piece from a deformed Jerusalem skull, and their solution gave rise to a very active formation and escape of gas.

The Museum of the Academy of Natural History of Philadelphia, is stated to contain bones of the Megalonyx and the extinct Peccary, remaining until this day nearly unchanged. It is asserted that very little of the gelatine has been lost, nor a particle of mineral matter added; it is even stated that some portions of articular cartilage and tendinous attachments are well preserved.

Many of the human bones found by Mr. Lund in the ossiferous

caves of Brazil were petrified in the same manner, offering the same metallic break, and penetrated by the same ferruginous incrustations as the bones of the extinct animals with which they were found associated.

The human bones found by M. de Christol in the caverns at Pondres (Departement Herault), contained as little animal matter as those of the hyænas and other extinct animals with which they were mingled; they were equally brittle, and as little adhesive. The test then is, after all, only a presumptive and by no means a decisive one.

M. Pictet\* has thus expressed himself respecting the question of Fossil Man:—

“The question may be put thus, at what period has man appeared upon the earth? What was the geological state of the surface of the earth? What animals lived at that period?

“A precise answer to these questions would be all that could be desired. We have not yet arrived at that point, though it seems we are nearer to it than we were some years ago.

“When the earth was sufficiently cooled down vegetation began to cover the emerged continents. After which the first zoological creation took place, and animals, differing from such as now exist, spread over the earth.

“Elevations and depressions modified the surface of the earth, and be it by the direct action of these phenomena, or by the organic laws which govern the world, and which we do not yet perfectly comprehend, the beings then living disappeared to be replaced by others. These phenomena, or something like them, occurred repeatedly, and thus numerous populations succeeded each other. Each of these has left its remains in strata, formed at different periods, and these remains are the ‘medals of the creation,’ which, with data furnished by geology, enable us to reconstitute the history of the globe. The existence of at least thirty epochs, more or less distinct, are recognized, each of which possessing a special Fauna.

“The imagination is unable to calculate the number of years or eras requisite for the succession of these phenomena, in which all these populations were developed by successive generations.

“As regards the history of man we need not occupy ourselves with these remote periods, we may take as a starting point the formation of the deposits of the tertiary period. These deposits, known by the name pliocene, are the last produced before the period when appeared

\* Pictet, *Biblioth. Univ. de Genève*, 1860.

for the first time the actual animal population. They contain the remains of species very similar to such now existing, belonging to the same genera though specifically distinct.

On the termination of the tertiary period, commences the period known by the name of *diluvian* or *quaternary*, which may be considered as the commencement of the actual period, when there existed a group of animals composed in part of existing species, or of such which are now extinct. The more this period is studied the more do we learn that the existing species, considered from a zoological point, date thence their origin, and that since that period there has been no violent but only gradual and, probably, successive extinction of certain remarkable species.

“These gradual extinctions do not admit of any precise chronology as we do not know when the last representative of each species lived. Have the ancient populations existed during the depositions of the lowest diluvian gravel? Have they seen the cave bear, the mammoth, etc.? Or did man only appear when the globe had entered into its actual condition?

“The answer to these questions has varied with time.

“We cannot dissimulate from ourselves that there exists a repugnance to accept the facts relating to the antiquity of man, and that a sort of relief is felt when the facts are contradicted.

“To us, in viewing the question from a palæontological point of view, the antiquity of the races of man is, to say the least, all but certain.

“The animals of the actual world certainly date their origin from the commencement of the diluvian period. There was then a creative force which interrupted, to a certain extent, the natural succession of beings. Is it not more rational to place the appearance of man at this period than to assume a new interruption in a relatively tranquil period, when the condition of the globe much resembled the present? We may also urge another consideration which has never been pressed, which may, nevertheless, possess a degree of reality.

“The presence of man in the diluvian period may, perhaps, explain the extinction of certain species. It, indeed, is remarkable that races of small dimensions, and, so to say, unperceived, have continued, such as small carnivorous animals, rodentia, bats, reptiles, etc., whilst the larger species have disappeared. There seems to us to be no sufficient reason that either inundations or climate should have destroyed them more than other animals. May not man have had some part in their destruction; and is it so improbable to believe that

either for his use or his security he destroyed the stag, the bear, the hyena, and even the mammoth? We do not insist upon these considerations, which are nothing but theoretical, but we could not omit stating them, in order to favourably predispose the reader to accept without preconceived opinions the facts we are about to state.

“It may be said that such imperfect specimens of human industry are insufficient to prove the existence of ancient races. Why is there no pottery, no bones found? It is difficult to give a direct reply. Perhaps the pottery or the bones have not resisted the action of the gravels with which they were rolled about. At any rate, if the hatchets bear really the traces of human workmanship are they not sufficient to prove man’s existence?”

“Such are the facts observed in 1859, all of which seem to agree to trace the origin of man up to the diluvian period.

“We terminate this article with a few observations on the volcanos of Auvergne, which appear to us to furnish, in relation to the history of man, some documents to which, in our opinion, too little importance has been attached. In 1844 M. Agnard, a distinguished palæontologist, announced the discovery of two human skeletons in the volcanic breccia of the volcano of Denise, near Puy-en-Velay. These volcanos of Auvergne became extinct in the remotest antiquity, and the breccia which encases these bones is not even derived from one of the last eruptions. We may add that on the opposite side of the mountain beds of tufa, apparently contemporaneous with those in which human bones have been found, are certain remains of the diluvian fauna, specially of the mammoth. These facts seem to indicate that man has lived in Auvergne at a remote period, when the volcanos were in a state of activity, and the extinct diluvian fauna still existed.

“This discovery was much contested. In the first place, the authenticity of the pieces enclosing the bones was denied; they went so far as to say that they were fabricated. We believe that at present all doubts on the point are removed. There remains, however, yet a difficulty. The rock where these human fossils have been found consists of two portions, the one compact, in which no bones have yet been found, the other light and porous, which alone contains these remains. It is not impossible that the porous rock may have been disturbed, that is, formed by crushed débris previously detached and again united, in which case they would belong to a more recent period. This hypothesis deserves to be examined.

“We earnestly call for a complete study of this subject, free from

any preconceived theories, to prove the great antiquity of the human species, and thus to contribute so important a page in the history of man."

*Human Fossils in America.*—Dr. Lund, the Danish naturalist, has given an account of his discoveries in the caves of Brazil, so rich in animal remains. He found human fossils in eight different localities, all bearing marks of geological antiquity, intermixed with those of numerous extinct animals. In the province of Minas Geraes he found human skeletons among the remains of forty-four species of extinct animals, among which was a fossil horse. In a cave on the borders of a lake called Loago Santa, he again collected multifarious human bones in the same condition as those of other extinct animals, and he considers that their geological relations unite to prove that they were entombed in their present position long before the formation of the lake on whose borders the cavern is situated, leaving thus no doubt of their coexistence in life, and their association in death. With regard to the race to which the human fossils belonged, Dr. Lund observes that the form of the cranium differed in no respect from the acknowledged American type. From these facts the American authorities conclude, not only that man was contemporaneous with the extinct animals, but that the aboriginal man in America antedates the Mississippi alluvia.

Professor Agassiz in his lectures, delivered at Mobile, 1853, says: \*  
 "Respecting the fossil remains of the human body I possess from Florida, I can only state, that the identity with human bones is beyond question; the parts preserved being the jaws with perfect teeth, and a portion of a foot. They were discovered by my friend Pourtales in a bluff upon the shores of lake Monroe, in Florida. The mass in which they were found is a conglomerate of rotten coral-reef, limestone, and shells.

"The question of their age is more difficult to settle. Considering that the marine animals now living along the coast of Florida have, at least, been in existence one hundred thousand years, for their remains are found in the coral, limestone, and upon the outside reefs, and assuming that the surface of the northern half of the peninsular already formed continued for nine-tenths of that time a desert waste, there would still remain ten thousand years during which it should be admitted that the mainland was inhabited by man and the land animals, vestiges of which have been buried in the deposits formed, by the fresh waters covering parts of its surface."

\* *Types of Mankind.*

In the Proceedings of the Academy of Natural Sciences, Philadelphia (1846), it was stated that Dr. Dickeson presented a relic of great interest, viz., the fossil *os innominatum* of a human subject taken from a stratum of blue clay, near Natchez, Mississippi, and about two feet below the skeletons of the *Megalonyx* and other genera of extinct quadrupeds. Sir Chas. Lyell acknowledges the bone to be fossil, but expresses his disbelief that it has been found in the blue clay. "He could not ascertain that the pelvis had been dug out in presence of a geologist, or a practised observer; he believed, therefore, that it was picked up in the bed of the stream, and he suggests that the pelvis may have fallen from the summit of the cliff. If it really was found *in situ* at the base of the precipice, its age would more probably be 100,000 years."

It would thus appear that the Americans not merely claim to be in possession of real human fossils, but they assert that they were found in positions which render them doubly interesting, as bearing witness to the very remote period of man's existence upon the earth. As no valid reasons have yet been shown that the relics are not fossil, and have not been found in the positions indicated, the subject is yet *sub judice*.

Dr. Dowler's sub-cypress man (*Tableaux of New Orleans*) caused a great sensation at the time of the discovery, and is still quoted as a fact in the most recent publications. In the excavation of the gas-works at New Orleans, burnt wood was found at the depth of sixteen feet, and at the same depth the workmen discovered the skeleton of a man. The cranium lay beneath the root of a cypress tree, belonging to the fourth forest level below the surface, and was in good preservation. The other bones crumbled to pieces on being handled. The type of the cranium was, as might be expected, that of the original American race. If we take, then, the present era (of the last emergence of the present site of New Orleans) at 14,400 years, and add three subterranean groups, each equal to the living (leaving out the fourth in which the skeleton was found) at 43,200, we have a total of 57,000 years. From these data, it would appear that the human race existed in the delta of the Mississippi more than 57,000 years ago; and then ten subterraneous forests, with the one now growing, establish that an exuberant flora existed in Louisiana more than 100,000 years earlier; so that 150,000 years ago the Mississippi bathed the magnificent cypress forests with its turbid waters. In a note sent to Drs. Nott and Gliddon, April, 1853, Dr. Dowler adds, "Since I sent you the tableaux several important discoveries have

been made, illustrative of its fundamental principles in relation to the antiquity of the human race in this delta, as proved by works of art underlying, not only the live-oak platform, but also the second range of subterranean cypress stumps, exposed during a recent excavation in a cypress basin."

As a climax, we add the following ludicrous description of a fossil man and woman, inserted in *Silliman's Journal of Sciences*.

*Fossil Man and Woman.*—A Cincinnati paper of March 23rd, 1855, contains a narration of the discovery of "some very curious petrified human bodies" found in Pennsylvania in the bed of a stream, which is one of the branches of the Alleghany river. The account says: "These remains are supposed to be those of a man and woman, who by the wonderful petrificative process have been turned to solid stone," and they are regarded as "irrefragable proofs of the existence of man upon this revolving globe long before the periods when corals, crinoids, and trilobites first made their appearance." But "the man is the great curiosity—its feet are now wanting; its body and legs are composed of sandstone, and its head of quartz and gneiss." Thus, according to the narrator, the whole science of geology is upset over and over. The writer continues, "it is assumed that when first found the feet were on this male petrification, but as they seemed slaty and of a coal-like texture, they were burned by the women, who prefer utility to scientific discovery. It is certain the man when alive must have inhabited the sandstone for a period, and if, as we think is evident, he was buried with his head downwards, and at just such depth that his head came in the gneiss, and his body in the sandstone formation (he might have added, his feet in a coal-bed), then it is easy to conclude that his body petrified into sandstone, and his head into quartz and gneiss."

Had Mr. Barnum got hold of this interesting couple, he would no doubt have retrieved his fortune. The whole story seems one of those hoaxes with which Yankee editors now and then amuse their readers. The explanation of the learned editor is just as curious as his petrifications.

In a work\* by Professor Brown, one of the first living mineralogists and geologists, which obtained the Prize of the French Academy, there occur the following passages relating to our subject: "There is no doubt that human bones and works of art have frequently been found mingled with remains of antedeluvian animals; but strenuous efforts have been

\* *Researches on the Laws of Development of the Organic World during the Formation of the Surface of the Earth.*

made to discard these facts by the hypothesis that they have become mingled at a subsequent period by currents of water, or it was at least maintained that the impossibility of such an hypothesis could not be demonstrated. All the cases, however, are of such a nature that a judge without any preconceived theory, would not hesitate one moment to adopt the simultaneous existence of man with the extinct species found in the same place. Many would have been glad to make the appearance of man the starting point of a new era in the history of the earth. We must, however, acknowledge that it becomes a very difficult point to establish a distinct line of demarcation between the tertiary and the actual epoch."

*Human Fossils in Europe.*—So long back as 1820, Baron von Schlottheim published at Gotha an account of human fossils discovered near Koestritz, Upper Saxony. They are situated in gypsum quarries, and from their first opening the bones of man were found intermingled without order with those of extinct animals. The bones are contained as collections in Gera, and of the Natural History Society of Altenburg. "These human bones from the nature of the soil could not have been buried there," observes von Schlottheim, "nor have fallen into fissures during battles of ancient times; they are few, completely isolated and detached.

In the year 1853, at the Meeting of Naturalists at Tübingen, some old skulls, taken from old, so called, Celtic graves at Sigmaringen, were shown by the writer of the article on "Fossil Bones" in the *Morgenblatt*; he immediately received a letter from a Professor of Surgery in Edinburgh, requesting the loan of the skulls. English journals had spread the report that the Rev. Mr. Fraas had exhibited to the Society genuine fossil human skulls, which had been recognized as such by the assembly. The error arose that at the time the discussion turned on fossil human teeth of Melchingen, Professor Kurr, of Stuttgart, had such a tooth for years, which had been described and sketched, and which Jaeger and R. Owen had declared to be an undoubted fossilised human tooth. More than half a dozen of such teeth have been found in Melchingen mixed with the bones of rhinoceros and dinotherium, and having the same bluish colour which distinguishes these fossils: This was an enigma, for these teeth must be older than mammoth and megatherium if they were really human teeth. There was no doubt about their being fossils. The problem is now solved. A Bavarian soldier found, 1837, in the Pentelikon, near Athens, remains of monkeys (*Mesopithecus pentelicus*); and in

the same year Lartet discovered similar bones at Sansan. Lartet was sent by the French Academy to Greece, and found a large number of fossil monkeys. The molar teeth of these Greek monkeys perfectly resemble the Melchingen teeth, which are no longer held to be human teeth.

Of the ossiferous caves in Sicily, that which has been often described is the Grotto di San Ciro, two miles from Palermo. Another cave, the Grotto di Maccagnone, about twenty-four miles from Palermo, was lately the special subject of Dr. Falconer's research, as may be found in the *Transactions* of the Geological Society, June 22, 1859.

The interior of the cavern is lined with stalagmite, and at a spot on the roof Dr. Falconer found a large patch of bone breccia, containing teeth of ruminants, bits of carbon, shells of several species of helix, and a vast abundance of flint and agate knives of human manufacture, closely resembling the knives from Mexico, Stonehenge, Arabia, and that they appear to have been formed by dislamination. Dr. Falconer draws the conclusion, 1st, That the cave was filled up within the human period; 2nd, that the coprolites of a large hyæna were similarly cemented to the roof at the same period; 3rd, that subsequently such a great change took place in the configuration of the district as to have caused the cave to be emptied of its contents, excepting the patches of materials cemented to the roof and since coated with additional stalagmite.

Mr. Prestwich gives, as the result of the examination of the bone cave at Brixham, in Devonshire, that numerous bones of the rhinoceros tichorhinus, horse, cave bear, and the hyæna, have been found, and several flint implements, one beneath the antlers of a reindeer, and a bone of the cave bear imbedded in the superficial stalagmite in the middle of the cave.

In a cavern near Mialet (department of Gard), in France, human bones were found mingled with the remains of bears, pottery, bracelets of bronze, and a Roman urn. Tessier, who described this cavern, supposes that the grotto may have at one period been a den of bears, and that afterwards it was taken possession of by the aboriginal inhabitants who left there the coarse pottery, and that at a subsequent period the Romans may have used the cavern as a place of sepulture, which may explain the presence of the urn and bracelets.

Similar caverns have been found in the south of France, as in the caverns of Bize and of Pondres (department Herault), where M. De Christol found human bones mixed with the remains of pottery and extinct animals.

It is unnecessary to dwell any longer upon what is called the cavern evidence in favour of the antiquity of man. Many geologists still view it with suspicion. This much, however, is certain, that we are furnished with numerous well-authenticated facts of the admixture of human bones and human implements with the remains of extinct animals. Several of the explorers of the caverns, moreover, express their firm conviction that the association of these remains was not accidental, that is to say, the admixture did not take place after each portion had been deposited elsewhere, but that they were entombed at the same time; whence the discoverers infer the contemporaneity of man's existence with what are called the antediluvian animals.

M. Littré\* makes the following remarks on some of the human remains found in Europe:—

“The finding of fossil monkeys, not merely in Asia and America, has naturally rendered the finding of human fossils less improbable.

“Not only in America have human bones been exhumed; the skulls discovered in various localities of Germany have nothing in common with those of the present inhabitants. They present a considerable flattening of the forehead, like the skulls of all the savages who had the custom of compressing that part of the head. Thus certain crania, found in the environs of Baden, in Austria, presented great analogies to the crania of African or Negro tribes, while those found on the banks of the Rhine and the Danube presented great resemblances to the crania of Carabs, or to those of the ancient inhabitants of Chili and Peru. It is true these determinations are still objected to by palæontologists: the remains are rare; the strata are uncertain; the bones may have been displaced by accidental circumstances, so that the terrain which concealed them may have appeared ante-historic. All these objections may render a suspension of judgment advisable; but do not oblige us, as is frequently done, to peremptorily reject all idea of a humanity anterior to the present humanity, the more so as it is not easy to dispose of the fact that these crania do not resemble those of the present inhabitants of the respective countries. No doubt these men, whoever they may have been, may have preceded the arrival of the Celts in Europe, and yet appertain to the historical period, though they have disappeared without leaving any trace.

“We have as yet no standard to measure the time elapsed. From the moment when man fashioned the stones to make himself implements to the time when we see him erect temples and pyramids,

\* From *Revue des Deux Mondes*, 1858.

and inscribe his monuments with hieroglyphics, a vast period must have elapsed. When the Egyptian priests conversed with Plato, and gave themselves an existence of ten thousand years, present investigators do not consider it as an idle boast."

*The Works of Man.*—Stone implements were well-known to the ancients by the name of *ceraunia* (thunderstones), and are particularly mentioned by Tacitus, as being used as implements of war. The name was probably derived from the Ceraunian mountains in Epirus, where, on account of the frequent and violent thunderstorms, they were said to be more abundantly met with than elsewhere. It is also known the ancients manufactured of these minerals sacrificial knives, battleaxes, hammers, etc.

Stone implements are also found in great abundance in Spain, and the Spanish peasants preserve them with a sort of superstition, believing, also, that they had fallen from heaven.

Seventy years ago a letter, containing the following passages, was addressed by John Frere, F.S.A., to the Rev. John Brand, then the secretary of the Antiquarian Society. The letter, with illustrations of the objects alluded to, is to be found, page 204, in vol. xiii of *Archæologia*.

"I take the liberty to request you to lay before the society some flints found in the parish of Hoxne, in the county of Suffolk, which if not particularly objects of curiosity must be considered in that light from the situation in which they were found."

Mr. Frere considered these flints as weapons of war fabricated and used by a people who had not the use of metals. They lay in great numbers at a depth of about twelve feet in a stratified soil, which was dug into for the purpose of raising clay for bricks. The strata were as follows:—

1. Vegetable earth, one foot and a half;
2. argill, seven feet and a half;
3. sand mixed with shells and other marine substances, one foot;
4. a gravelly soil in which the flints are found, generally at the rate of five or six in a square yard.

In the stratum of sand were found some extraordinary bones, particularly a jaw-bone of enormous size, of some unknown animal, with the teeth remaining in it. This it appears has been presented, with a huge thigh-bone found in the same place, to Sir Ashton Lever, and is, therefore, probably now in the Parkinson Museum.

The situation in which these weapons were found, observes Mr. Frere, may tempt us to refer them to a *very remote period, even beyond that of the present world*. Mr. Frere further remarks that the

manner in which they lie would lead to the persuasion that it *was a place of their manufacture*, and not of their accidental deposit; and the numbers of them were so great, that the man who carried on the brickwork told me that before he was aware of their being objects of curiosity he had emptied baskets full of them into the ruts of the adjoining road.

This letter, containing such curious facts, pregnant with such important inferences in relation to the history of mankind, seems scarcely to have excited the interest of the learned body to which it was addressed. It does not appear that any discussion was raised on the subject, nor any further notice taken of the communication. The facts and the very name of the discoverer were forgotten, and allowed to lie entombed in the ponderous pages of *Archæologia* for more than half a century before they were disinterred and brought to light again by the zeal of Mr. John Evans. And yet short as the letter is it contains the very essence of all subsequent discoveries and speculations on the antiquity of the human race.

*Boucher de Perthes.*—Although, as has just been shown, not the first discoverer, yet to M. Boucher de Perthes, the amiable and accomplished president of the Emulation Society of Abbeville, belongs the great merit of having successfully attracted the attention of the learned world to the primitive industry of man. It may be useful to trace the process by which M. Boucher arrived at his conclusions as stated by him in his recent work *On the Antediluvian Man and his Works*. It appears that as far back as 1805, M. Boucher visited the Roland Grotto, near Marseilles, and in 1810 the Grotto de Palo, in the Papal dominions, where among some animal bones he found certain flints, which struck him as having been worked. The yellow tint which distinguished some of these stones made him suspect that they were not in their original position, but that the colour was due to the ferruginous nature of the soil with which they were originally in contact. As certain beds of the diluvians exhibited the same shade as the flints, his endeavours were chiefly directed to find the stones *in situ*.

Circumstances favoured his labours. Extensive works undertaken for the fortification of Abbeville,—the digging of a canal, the preparations for the railroads between 1830 and 1840, successively laid open numerous beds of the diluvium, upon which the valley of the Somme reposes. It was in 1838 that M. Boucher first submitted his implements to the Society of Emulation of Abbeville for inspection. In 1839 he brought some of them to Paris, where he showed them to

several members of the Institute, among others to M. Brogniart, who was perhaps more than any other interested that the discovery should turn out a delusion, because he held with Cuvier that man was of recent origin, and not the contemporary of the extinct pachydermata. M. Brogniart was, however, soon converted. M. Boucher entertained strong hopes that his work on *Antediluvian Antiquities* would dissipate all doubts. Nothing of the kind. Nobody would believe his theory, which every one who chose could have verified on the spot; it met with utter neglect.

It was thus that M. Boucher's theory peaceably slumbered for seven years, until in 1854 Dr. Rigollot, who, on mere hearsay, had for ten years been a staunch adversary of the antediluvian theory, decided to judge for himself by visiting Abbeville, Saint Acheul, and Saint Roch. His conversion was prompt and decisive, and, like an honest man, he publicly declared his error in a memoir on flint instruments found at Saint Acheul, Amiens, etc.

"This clear and conscientiously written memoir," says M. Boucher, "recalled attention to my work. Its reception was, unfortunately, not favourable. Being a purely geological question, it became the subject of religious controversy. Those who did not attack my religious belief accused me of temerity. What! an unknown archæologist, a geologist without a diploma,—a strange pretention indeed to attempt subverting a system confirmed by long experience, and adopted by the most eminent men on science!

M. Boucher, however, persevered, and he is now reaping his reward; for, as we shall presently see, the most distinguished geologists now range themselves by his side.

The questions we have to deal with in relation to flint implements are the following:—

1. Are these rude objects, which pass by the name of antediluvian hatchets, really of human workmanship? or may we not, with equal probability, assume that the shape of these flints is simply accidental, and produced by natural agencies.
2. Are they found in undisturbed ground, and if so, what is the probable age of the strata in which they are imbedded?
3. Assuming that the flints are the result of human labour, was man the contemporary of the extinct mammalia, with the bones of which the flint implements are associated.
4. What race of men was it that fabricated the implements?

There can be no doubt that, at first sight, even an unprejudiced investigator may see in these rude flints, with their rugged surfaces, nothing, or at least very little, characteristic of human labour.

It is equally certain that flints may, by being knocked about with other hard stones, or by other agencies, be naturally fractured in a variety of curious shapes, simulating the forms of implements or other objects. How, then, are we to distinguish between the accidental forms or freaks of nature, as some have called them, and those produced by the human hand?

Mr. Edwards, of Birmingham, asserted that he saw in his own glass manufactory the operation of a natural law producing fragments of glass, (a kindred material to the flint), which closely approach the forms of celts. When any imperfection renders an article useless for its intended purpose the workman puts it away without annealing it, when in a few minutes it is riven to fragments, which will be found invariably either wedgelike, or following more or less the general shape of arrow or spear heads.

The theory which he bases upon these facts, he states thus:—  
 “I suppose that in the early geologic periods masses of flint or large boulders may have become heated by subterranean fires, and while in an incandescent state have been suddenly thrown by volcanic force to a cool place; the outside of the mass would soon begin to contract, while the inside would retain its heat and its expanded condition: the struggle between the two forces would go on until the mass was rent to fragments, and each of these fragments would be one of the ‘works of art,’ of which we have lately heard so much.” And of which, we venture to say, Mr. Edwards will hear much more in time to come.

To this theory of a practical man, Dr. Collyer simply replied that, in the first place, “the parallelism is not correct, as the substances are so different in their structure and their mode of production.

“Secondly, had calcination or heat been the cause of the chipping or fracture of the portions, which indicate them to be work of human agency, how is it that those portions of the boulder, not essential to the instrument, are always left unchipped?

“And, thirdly, had calcination in any way acted in producing these partial detachments, how is it that the untouched surface does not exhibit the action of fire?”

*Characteristics of Antediluvian Implements.*—The commercial adage that demand creates supply, applies equally to flint implements. Not unlike the manufacturers of relics in the holy cities of the East, the workmen at Abbeville and St. Acheul soon found it to their advantage to fabricate antediluvian hatchets on their own account, and to pass them off to visitors as the genuine article.

Thus M. George Pouchet tells us that when, in August 1859, he visited Saint Acheul, the miners tried to impose upon him; but he soon detected that the pretended *langus de chat* was a deception, and that the flint had been fraudulently introduced into an artificial cavity. When, however, after the lapse of some days, he succeeded in finding some hatchets embedded in the diluvium under such conditions that a mystification was out of the question, his doubts were removed, and he came to the conclusion that the flints are objects worked by man at a period long anterior to that usually assigned to man's appearance upon the earth.

It is, therefore, of some importance to distinguish the spurious from the genuine implements. M. Pouchet thinks that in the progress of time infiltrations reached the diluvium, depositing a crust of carbonate of lime of about one millimetre in thickness upon one of the surfaces of the flints *in situ*, which incrustation is seen upon all the genuine hatchets at Saint Acheul, and is absent in the spurious flints fabricated by the miners. Some of the genuine implements have, moreover, the characteristic peculiarity of presenting upon the surface, not covered by calcareous deposit, dendritic impressions. Though the existence of dendrites is not an absolute mark of diluvian implements, since it is also found upon some Celtic hatchets, it still offers in most cases a fair presumption in favour of great antiquity.

*Colour.*—The hatchets found at Amiens are all of flint, and of three colours; black, white, and red. The red and the white generally occupy the superficial layer. The hatchets found in a dry soil have remained black. Those reached by ferruginous infiltrations have become red. The diluvian implements have, in fact, generally the colour of the stratum in which they were embedded; so that a flint deposited between two different seams bears on each surface the colour of the respective seam with which it was in contact. This double shade penetrates the stone, the internal part being generally black. In post-diluvian implements the colour is generally the same throughout. Thus a Celtic hatchet may be imitated, but a spurious diluvian implement is easily detected. Diluvian implements have never been found polished.

Another great characteristic of worked flints is their striking resemblance to each other in almost every country where they have been found. Individually each diluvian implement may be considered an accident; but when viewed collectively, and it is seen that the chips have been taken off in the same places and in the same manner, presenting identical forms, obviously the result of identical intention, we

are irresistibly led to the conclusion that the hand of man has done it. Wherever they have been found, whether in the east or in the west, in the south or in the north, they resemble each other in form, though they may differ in finish.

On comparing the woodcut representing the flint implement found by Mr. Taylor in the Mound Abusharein (see *Proceedings of the Society of Antiquaries*, No. 2, 1860) with that of the flint weapon found by Mr. Frere, at Hoxne, in Suffolk, as it appears in the thirteenth volume of *Archæologia*, published about sixty years ago, they appear nearly identical in shape and external aspect.

M. Boucher's collection of flint instruments, probably the most interesting of the kind in existence, is arranged according to the beds in which they were found.

1. Modern remains. 2. Medals and other metallic objects of the Roman period. 3. Similar objects found at greater depth, mingled with stone hatchets of the Gallo-Roman period. 4. Stone hatchets of the Celtic period, found at a still greater depth, not mixed with metallic objects of the Celtic period. 5. Objects from the soil beneath the Celtic bed, consisting of two strata, the superior stratum presenting no traces of human workmanship, while the lower stratum is the diluvium containing the implements called by M. Boucher "antediluvian hatchets."

One of the most serious objections\* which have been urged against

\* One of the objections which was originally urged against the assumption that these implements are works of art is the large quantity found in certain localities. Thus, one of our most esteemed antiquaries, Mr. Thomas Wright, said, (*Athenæum*, June 18th, 1859), "The quantity of these implements which are found—two or three hundred in one gravel pit, with an intimation that they occur similarly through the whole drift formation, seems to me to be quite enough to make us hesitate. If we receive them as made by the hand of man, we must suppose that at this extremely remote period the surface of the globe was covered with human beings, who spent all their lives in chipping flints into the rude forms of weapons, and throwing them about."

Another circumstance that induced Mr. Wright to disbelieve that these flints have been fashioned by the hand of man, is the total absence of anything of what we call finish, and that the forms might have been produced naturally, by violent and continued gyratory motion—perhaps in water, in which they were liable to be struck by other bodies in the same movement."

Now the absence of anything like "finish," which is urged as an objection, chiefly by archaeologists who, it has been well observed, are more accustomed to the productions of a later period, may be disposed of by the fact that even some of the Celtic hatchets found in Celtic graves, and the authenticity of which is undoubted, are equally uncouth, unpolished, and produced by simple percussion.

Despite of their rough surface the objects present generally such a uniform shape, which stamps them as the work of man. In many of the hatchets it is found that the circumference describes regular elliptic curves, the two surfaces being convex and symmetrical like a lens. The implement is seen to diminish gradually on all sides. No flints broken by accident or design furnish such regular forms. Hence, even the workmen in France were struck with their regularity, and gave them the name of "cats' tongues."

the worked-flint theory arises from the circumstance that no human bones, which are considered as capable of preservation as those of the extinct animals, are found in the same beds with the flints. But though there can be no doubt that the finding of human fossils in the diluvium mingled with the works of man would at once clinch the argument, their absence cannot invalidate the legitimate deduction of the geological theory, unless the evidence in favour of the flints being worked be entirely rejected.

In the last edition of Professor Phillips' *Manual of Geology*, that gentleman expresses his surprise that the bones of man should so rarely be met with in the deposits of the diluvium, since at that time the earth had assumed its present form, and was inhabited by quadrupeds closely allied to those which now exist, especially the horse and domestic cattle, so singularly serviceable and dependant on man. He justly observes that those parts of the earth's surface to which tradition and, perhaps, general reasoning seem to point as the first sites of the human race, the central regions of Asia, have been as yet little examined with reference to this question. It may be very possible to discover these there even in abundance. Upon the whole, he considers that it may be stated, as a general admission, that man did not exist on the globe during the secondary and, probably, not during the epoch of eocene and pleiocene formations, and that, though sufficient evidence for man's coexistence in northern climes with the mammoths and hippopotami is yet wanting: but as the races of oxen, horses, camels, etc., had then begun, it is not an unreasonable expectation that eventually the question will be decided in the affirmative.

Boucher de Perthes, in a letter addressed to the secretary of the Paris Anthropological Society,\* writes that he found his first antediluvian hatchets in 1839; that he had shown them to several academicians in 1840, especially to M. Alexandre Brongniart. That he had excavated them a year before the miners of Abbeville had discovered any, and that he had considerable trouble to teach the workmen to distinguish the worked flints. It was the same with the miners at Amiens, who only commenced to search for them in 1853, after M. Rigollot had taught them how to distinguish the flints.

M. de Castelnau, after stating that he has no preconceived idea against M. Boucher's doctrine, considering that the ideas of Cuvier in regard to the recent appearance of man had appeared open to many objections, still required rigorous proofs. Now, among the imple-

\* Séance Nov. 17th, 1859.

ments presented, there was in his opinion but one perfectly characteristic of human workmanship, namely, hatchet No. 5, found by M. G. Saint-Hilaire, and justly referred to by him to the Celtic period. It is even questionable whether this object without a handle, and which was used rather as a wedge (*coin*), deserves the name of a hatchet. He still more objected to that name being given to the older objects, of which the forms are so different from the form of real hatchets. These latter, excavated from the diluvium, appeared to him very doubtful. Are these coarse, irregular, angular objects, with their rugous surfaces, really the result of human labour; and may they not with equal probability be attributed to the percussion of flints rolled in the same torrent?

Among the innumerable fragments, there may be some the forms of which remind us of the implements fabricated by man at a later period, and which are designated by the name of Celtic hatchets.

*M. Baillarger* agrees with M. Castelnau, and excepting the Celtic hatchet, sees nothing characteristic of human labour in the other objects. He also considers the name of hatchet objectionable. A hatchet should have a handle and a hole to receive it. This hole exists in some Celtic implements, which then deserve the name. There is no trace even in Saint-Hilaire's implement of a hole; it was used as a wedge.

*M. Broca* considers that the name given to these implements is of little importance. Some of the Celtic implements have holes, and bear legitimately the name of hatchets; others have none, being evidently the product of art less advanced. As to the diluvial instruments, it is merely by extension that the name hatchets has been given to them.

*M. Castelnau.* If the flints in question are really worked by the human hand, that race must have been much inferior to the present race. A race which has left no other traces of its industry than these crude and nearly shapeless objects, can have been but little superior to the monkey species. Much more mental energy would not be required by the gorilla to produce similar instruments.

*M. Bertillet.* At first sight, one is apt to agree with M. Castelnau, but a closer investigation shows that, despite the irregular asperities of the surface, the objects present such a general uniform shape, as is the index of real workmanship. He draws attention to hatchet No. 1. Setting aside the superficial rugosities, the circumference describes a regular elliptic curve; its two surfaces are convex and symmetric, like those of a lens. The maximum thickness ex-

actly corresponds to the centre of the ellipse, the instrument then gradually diminishes on all sides. He had seen flints broken by accident either by the hand of man or other violent action, but had never seen forms like those presented. Certainly, if the object were polished, it might be compared to the best works of a later period. This particular form extends to a large number of the implements, and the picturesque name "langues de chat" given to them by the miners shows that they have been struck by their regular forms. The objection that the surfaces are rugous appeared to him without much value. The first men possessed no metallic engines requisite to polish hard stones, an art but slowly developed. Even hatchet No. 4, found by Boucher de Perthes in a Celtic sepulture, the authenticity of which is undoubted, still presents a rugous surface, and appears to have been produced by simple percussion, like the implements of the diluvium.

*M. Lagneau.* It would be of the highest interest to determine the period in which the race of men lived who fabricated the implements found at Abbeville and St. Acheul. The race was, no doubt, anterior to the Celtic epoch; and may be anterior to the so-called original race which preceded the Gauls and Celts in western Europe. The race of the ancient Britons, of which the English anthropologists have found traces in the British Isles, and which Dr. Ware of Edinburgh, from a passage of Tacitus and other documents, considers of Iberian origin, had been supplanted and destroyed by the Celts. Is it by this antique race, which probably had also occupied the north of France, that the diluvian hatchets had been worked? Was it not rather to a still older race, with narrow crania and a sharp facial angle, such as have been found by Mr. Spring in the environs of Namur, that they must be attributed?

*M. Castelnau* still objects. Let it be remembered that flints for firearms were formerly fabricated by mere percussion, by which they received a perfectly regular form. Even at this day, savage nations, ignorant of the use of metals, produce stone implements, which may be considered as masterpieces compared with the objects found in the diluvium. He persists, therefore, in his opinion, that if these flints are really the work of man, the race which fabricated them must have been much inferior to the present race.

*M. Broca* is disposed to admit with *M. Castelnau* that an ante-historic race, of which Boucher de Perthes has discovered the traces, was much inferior to the succeeding races, and probably inferior to any existing, though it be somewhat difficult to conceive a human

race inferior to the Tasmanian, to the Aïgtas of the Philippines. It may be remarked that the human crania, more or less fossil, found in Europe, in old strata beneath modern beds, belong mostly to the prognathic race, much inferior to the races which occupied Europe since the historic age. The fossil cranium, found in 1844 by M. Aymard upon Mount Denise near Puy-en-Velay, presents, it is true, the Caucasian shape, but the crania discovered in the environs of Baden, in Austria, present the African type; while those found on the borders of the Rhine and the Danube approach the shape of the crania of the Caribs. The human bones found in Mount Chauveau (Namur), forty metres beneath the bed of the Meuse, are thus described by Dr. Spring. Cranium very small in the absolute, also very small when compared with the considerable development of the jaws; forehead receding, temples flattened, nostrils large; dental arches very voluminous, inclined forwards, supporting oblique teeth; facial angle about seventy degrees. The bones of the limbs rather short, indicating a stature not quite as high as that of the Laplanders. It may be added that this race cannot be compared with the actual hyperborean race, who have large globular heads and vertical teeth. It must then have been a race actually extinct, whose small crania, development of the jaws and prognathism, are evident marks of inferiority. It becomes thus probable that the human beings who lived before the formation of the diluvial beds, more ancient than those whose bones were discovered by Dr. Spring, must have been of at least an equal inferiority.

These and other considerations induce the belief of an inferiority of these primitive races. The mere rudeness of the diluvian hatchets is scarcely sufficient by itself to come to that conclusion, as it requires a long time before even an intelligent race, deprived of the use of metals, arrives to a degree of producing refined objects of industry. If a number of Europeans were landed on a desert island, naked and without any instruments whatever, they would be much embarrassed to produce, without any metal, objects much more perfect than those flint implements.

*M. Baillarger.* It seems to result from the discussion that some, at least, of the flint implements found in the diluvium are really of human workmanship, which, in itself, is of great importance; but what is of greater interest is to appreciate, if possible, the intellectual state of the people who produced them. It seemed to him that the race was physically and morally inferior to the succeeding races. The smallness of the skull and of stature, the great development of the

jaws, concur to prove it. The race exists no longer in Europe as a race, though they spring up occasionally among actual races. Such individuals bear the name of *Microcephali*, of which he promised to give some account to the society on a subsequent occasion.

*M. Broca.\** The absence of polish cannot be considered as a negative proof, as hatchet 4 from a Celtic sepulchre, is equally cut by percussion, which may also be said as to the knives, for a similar Celtic unpolished knife has been in a Celtic grave. Has no doubt whatever as to the relative inferiority of the primitive races, as everywhere their bones belonged to inferior types. Jass Steenstrup, of Copenhagen, states that in the inferior beds of Denmark all the crania are brachycephali. These brachycephales of Denmark have not passed the stone period. The initial period of human existence might be called the age of wood, when the ancient heroes, like Hercules, fought savage beasts with clubs. This period did not last long, and the stone period commenced. The *Autochthones* of Denmark, described by M. Steenstrup, lived, nevertheless, at a more recent period than those who fabricated the hatchets found by M. Perthes in the diluvium. The former were sufficiently advanced to polish the flints by friction. We also find in the so-called Celtic period (though much anterior to the actual arrival of the Celts), cutting instruments produced not by simple fracture but by repeated friction. It must be added that the position of these hatchets in the bed of the diluvium indicates that the period was separated from the present epoch, if not by a general geological revolution, at any rate by a local cataclysm, in which possibly the primitive race has perished like the elephant and rhinoceros. Possibly, also, the people saved themselves in time. And until human bones were found in the diluvium it might be a doubtful question whether the brachycephalous race existed in Western Europe before the arrival of the Celts and other dolichocephalous races, descended or not from these people, the traces of which were discovered by Boucher de Perthes.

*M. Trelat.* It has been said that the people who made the flint implements must have possessed but little intelligence. I have examined the arms of the savages of Oceania, in the Anthropological Museum of the Louvre, and although these races had ample means to perfect their industry for centuries, and though a great many of their arms exhibit considerable skill, flints still serve them as cutting instruments. There are some of these polished, others are rough;

\* Seance December 15th.

some are fabricated by percussion, others by friction. I must also observe that the expressions, stone, bronze, and coin period must not be taken literally. The invention of the hard metals did not immediately make the peoples renounce stone implements. Among the objects found in the Danish and Scandinavian tombs, even down to the ninth century of our era, stone instruments are found commingled with metallic implements. I was also anxious to ascertain the cause of the white or greyish colour which characterizes most of the hatchets of the Celtic period, and which might cause the belief that they are made of calcareous matter. These hatchets are really flint, despite the appearance, and their colour is due to the calcination to which they had been subjected. This was a common practice amongst the Gauls. They thought, by subjecting them to fire, their arms became harder, and it was not merely the stone implements, but also their wooden arms which were thus treated.

Surprise has also been expressed at the great number of worked flints found in confined spaces at Amiens and Abbeville; the following facts may, perhaps, explain it. Not far from Dieppe is a spot called *la cité des limes*. The origin of the word, and the date to which most refer the existence of this so-called city, is unknown. I have preserved the name city, as such is the expression, though it is well known that the ancient Gauls did not build; their cities were but intrenched camps, where they elevated some rude huts. Well, in this *cité des limes* there have been found the vestiges of an ancient manufactory of flint implements. A great many of these have been found to be knives produced by chipping, as well as polished hatchets. Here various instruments were separated from each other at regular distances. One of these hatchets is polished at one end and rough at the other. None of them has a hole for the handle. They were handled by pincers, as the islanders of Oceania do to this day. The process of pinching was conserved for a long time even for bronze instruments. I have seen numerous examples of them in the Louvre.

There has been found, at St. Acheul, a very different object; it is a necklace, or rather a bracelet, composed of about twenty spheric beads, varying from seven to fourteen millimètres in diameter. All these beads are perforated by a central hole, and are mostly composed of a rather soft calcareous substance. Two of them are cut out in a mass of madrepora. All these beads were evidently parts of the same ornament, for they were found very close to each other.\*

\* The *Coscinopora globularis*.

*M. G. St. Hilaire.* The fact communicated by M. Trelat supports the opinion of M. Dunoyer, who believes to have found, at Amiens, the vestiges of an ancient manufactory of worked flints.

*M. Bertillon* has read, in *Cosmos*, that in Spain a large number of stone implements had been found, both in the soil and in the tombs. The Spanish peasants preserve these implements with a sort of superstition. The author of *Cosmos* thinks that these instruments were not arms, but were used by the ancient Iberians for religious ceremonies. They were believed to have fallen from heaven.

*M. Broca* agrees that the expression, stone, bronze, and iron period must not be taken in an absolute sense. A new industry does not immediately replace an old one. The first metallic instruments were too precious and rare to be general. The chiefs only possessed them, while the people for a long time after used stone implements, and several centuries had elapsed before the use of the stone implements was given up. Nevertheless the intermediate period was not so long as imagined by M. Trelat; that it continued in Denmark until the ninth century. As these implements figured also in the religious ceremonies, they were deposited in large numbers in tombs, as long as the same culte continued. Thus, then, in Denmark they are found as late as the ninth century, because at that epoch the Danes embraced Christianity. But it must not be believed that they used the implements until that period as tools or arms.

Now far be from us to complain of the opposition which the worked-flint theories have met with. There is scarcely an instance of any great truth or any great fact having been enunciated without having been received either with a shout of derision or violent indignation, not merely by the ignorant masses, but by learned bodies. And thus it should be; it is the constitutional opposition in the republic of the mind. Every alleged new truth is frequently so much mixed up with error, and every new fact so much combined with fiction, that they are all the better for undergoing a thorough sifting examination. But there is a medium in all things. Whilst there is and ought to be a rational scepticism which tries to prove all things, and holds fast to that which is good and true, there is also such a thing as fanatical scepticism, which shuts its eyes to all evidence, and tortures itself to find out the most far-fetched and improbable hypotheses for rejecting or explaining away any new fact or hypothesis, specially in such cases when the new theory apparently clashes with long cherished and pre-conceived notions.

We shall endeavour to examine whether the opposition to the

worked-flints theory, with the evidence in its favour, partakes more of the former than of the latter character.

There is one stubborn fact which cannot be gainsaid, and which is this: that all who have visited the spots, though they may have come to scoff have remained to pray; that is to say, went away with the conviction that the worked-flint theory is a great fact.

M. Alfred Maury, member of the French Institute, formerly a sceptic, after having found the traces of man in undisturbed ground, on the banks of the Somme, says,\* "All doubts raised by geologists as to the exactness of Boucher de Perthes' observations must vanish. Man has, indeed, left the proofs of his existence at a period the antiquity of which cannot yet be calculated, but which contradicts all historical inductions. These hatchets cannot have been transported from afar, for their edges are scarcely blunted; they denote a very primitive state of human society."

Professor Albert Gaudry, of the Paris Museum of Natural History, the author of several works on Palæontology, was sent to Amiens and Abbeville, in August 1859. After having minutely examined and analyzed the soil, and found that it had not been disturbed, he extracted, in the presence of MM. Hittorf, Ponsard, and Garnier, nine hatchets from the rock in which they were embedded among fossil bones. His Report to the Academy of Sciences, read October 3rd, contains the following conclusions at which he had arrived.

1. Man was the contemporary of the *Rhinoceros tichorhinus*, *Hippopotamus major*, *Elephas primigenius*, *Cervus somonensis*, and other extinct animals.

2. The bed called by geologists the diluvium has been formed, partly at least, after the appearance of man. The formation has doubtless been the result of the great cataclysm.

Professor Gaudry cautions investigators not to quit the miners for a moment, and to assure themselves that the implements are *in situ*.

M. de Saulcy, the celebrated antiquary and traveller, who at first strongly opposed the theory of the antediluvian man, now expresses his opinion that the presence of the works of man in the diluvium, and the existence of man at the same time and at the same places with the huge animals now extinct are incontestable facts.

M. Lartet says†—"Of all discoveries proving the high antiquity

\* *Revue des Deux Mondes*.

† Extract from a Note presented by M. E. Lartet to the Academie des Sciences, March 19th, 1860, on the "Geological Antiquity of the Human Race in Western Europe."

of the human species in the west of Europe, the worked flints collected by Boucher de Perthes are the most conclusive evidence.

"It is now admitted as a geological fact that England and the continent were united anterior to any historical tradition. This continuity is proved also by the actual presence, on both sides of the channel, of the same species of land animals the original intermigration of which could only have taken place on terra firma."

. D'Archiac (*Bulletin de la Soc. Geol.*, t. x) thinks that the separation of the British Isles from the continent had taken place *after* the deposit of the diluvian gravel and before the ancient alluvion. The fact is, that the phenomenon which has produced the *Loess* or ancient alluvion in the north of France and Belgium has left no trace in England. On the other hand, Elie de Beaumont has clearly indicated the relations between certain dislocations of the system of the great Alps and the erratic alluvions in our valleys. The conclusions to be drawn from these hypotheses are manifest: the human race which has fashioned the flints of the diluvium of Abbeville and Amiens had taken possession of that country at the time the British Islands were yet connected with the continent, since the separation of these isles had only been effected after the formation of the diluvian banks where the implements are found. As the formation of these diluvian banks was one of the consequences of the last Alpine dislocations, the same human race must have existed before central Europe had attained its actual orographic state. The apparition of man in the *western regions of Europe* must therefore date from an epoch when the surface of that continent must have been considerably different from what it is now.

The question now is, has there, between that phase of the human period and the present one, *in that part of our continent*, been a sudden great revolution—a catastrophe sufficiently general—so as to interrupt a regular succession of organized beings? Do we find of such a catastrophe indubitable traces? If in the class of mammalia we find the disappearance of some species (ten at most), observation tends daily to establish that this disappearance was the result, not of a simultaneous destruction, but of successive extinctions, which appear to have been gradual in time and space.

We arrive inevitably at the conclusion that the terrestrial population of our continent has passed through all the so-called critical phases of the long *quaternary* period so variously affected by geological phenomena. If the persistence of species and the continuation of habitat has been possible for animals of all kinds, it must have been equally

possible for man their contemporary, placed in the same circumstances. Why should there have been a biological intermission as regards man only when it is demonstrated that there was none in the animal species."

M. Lartet also writes\*—"I drew, also, the attention of the Academy to observations since frequently made on the traces of intentional action on the fossil bones found in the same beds as the flints, or in other layers of the same age. In announcing, not without hesitation, these facts, I had no wish to force their immediate adoption, but rather to provoke researches in the same field. Now, however, as new observations seem to confirm my first impressions, and being now able to submit well authenticated specimens for the examination of men eminent in science, I feel more confidence in submitting the following conclusions.

"The impressions on the fossil bones are evidently the work of man. These marks consist of excisions and incisions so neat and penetrating that they could only have been effected on the bone while yet in a fresh state not yet deprived of animal matter. The numerous fossil bones which present these incisions belong partly to large extinct mammalia of the pre-historic period (*Megaceros hibernicus*, *Cervus somonensis*, *Rhinoceros tichorhinus*). Others belong to the common stag, the aurochs species, still existing. The marks on the latter are not less valuable considering that these bones have been found in the same beds intermixed with the bones of the *elephas primigenius*, the rhinoceros, and the megaceros.

"I may also observe that remains of the aurochs, of the stag, and of other still existing species, have been found in England, France, and Italy in the lower tertiary strata, and ought consequently to be older than those in which the bones of the *Elephas primigenius* and *Rhinoceros tichorhinus* are found. Thus, the aurochs and the stag are more entitled to be called antediluvian animals, if we are determined not to banish this improper expression from science.

"I ought to add that hitherto I have not observed unquestionable traces of human workmanship on the bones of the fossil elephant nor on those of the great carnivora of that epoch. The worked bones found in the caves belong nearly all to ruminants or horses. I have, however, found upon rhinoceros bones well marked impressions. The observations, however, on cave bones do not furnish the same degree of precision and certainty. I refrain, therefore, from drawing from them any deduction.

\* "Geological Antiquity of Mankind," *Comptes Rendus*, April 19th, 1860.

"I would but remind the Academy that the specimens presented with my note on March 19 are all well authenticated as coming from the diluvium, the geognostic condition of which has been well established, or from other strata of an equivalent age."

M. Collomb says\*—"The thesis I purpose sustaining is that of the existence of man prior to the existence of the old glaciers. In my view, man existed at the commencement of the quaternary period, and was the contemporary of the *elephas primigenius*, the *rhinoceros tichorhinus*, the *ursus spelæus*, etc., and many other extinct species, which are only found in the deposits immediately succeeding the tertiary series.

"To arrive at these conclusions, it must be first admitted—

"1. That the quaternary deposits (of which the authors have given sections) have not been subsequently disturbed.

"2. That the objects of human industry found in them are unquestionably the works of the human hand, and that they have not been subsequently introduced in their natural positions.

"This being granted, let us see what passes in the basin of the Somme, where Boucher de Perthes has collected so many flint implements.

"The following is the section which I have examined, in company with M. Lartet, at Saint Acheul. Omitting details, I find the following:—

"1. Superior portion, lehm (loam, clay) or loess.

"2. Middle portion, beds of grey and red sand, with small beds of silex.

"3. Inferior portion, gravel, the greater portion of which is formed of rolled silex and chalk, containing flint implements.

"In the basin of the Seine the quaternary terrain is, according to D'Orbigny, formed,—

"1. Lehm and vegetable earth.

"2. Red diluvium, quartzose sand with gravel, and marl without any shells.

"3. Grey diluvium with granitic elements, beds of marl sand with lacustrine shells; gravel at the base containing the remains of elephants and the rhinoceros.

"It is in the inferior portion of the grey diluvium at Grenelle that M. Gosse found a flint hatchet, exactly resembling those I found at

\* "On the Existence of Man prior to the Apparition of the Ancient Glaciers." Letter by Ed. Collomb to Alph. Tarre; *Bibliothèque Univ. de Genève*, tom. viii. 1860.

St. Acheul; he found there other objects fashioned by man amongst the bones of extinct mammals.

“In the department of the Yonne, in the grottoes of Arci, M. De Vibraye noted the following arrangement:—

“1. Superior part, argillaceous lehm.

“2. Middle part, sand and calcareous gravel, derived from the adjoining mountains.

“3. Inferior part, rolled gravel, originating from distant rocks, namely, from the Morvan.

“It is in this inferior bed that he found a fossil human jaw, with a head of the *Ursus spelæus*.

“In short, the sections of the quaternary terrain may (omitting local details) be condensed in three distinct strata.

“The superior, known by the name lehm or loess.

“The middle, of sand, gravel, etc., but little rolled, the origin of which is not from a great distance (red diluvium of Paris).

“The inferior, rolled gravel, origin more distant (grey diluvium of Paris).

“These sections being admitted, I shall now demonstrate that man made his appearance *prior* to the ancient glaciers. For this purpose we shall examine the quaternary deposits of the valley of the Rhine, and also those of a valley in the Vosges; we shall not find man there, but we institute some comparisons which, if they do not carry conviction, may throw much light upon the question.

“The quaternary terrain of the valley of the Rhine, from Basle to Mayence, is composed of three characteristic deposits, like the rest of France.

“Superior, lehm.

“Middle, gravel, derived from the Vosges on the left bank of the Rhine, the Black Forest on the right bank, and the Jura above the basin.

“Inferior, gravel exclusively composed of pebbles of Alpine origin.

“In the interior of a valley of the Vosges we have the following section (Diagram of section).

“1. Moraines, well characterised.

“2. Rolled gravel, without any striated pebbles.

“3. Granite, or transitive rock.

“The terrains present themselves in the plains and the mountains in the following manner (Section given):—

“1. Moraine in the mountain, lehm in the plain.

“2. Middle, rolled gravel of a local origin.

“3. Inferior, rolled gravel of Alpine origin.

“In the plain of Alsace the deposits are regularly stratified, not having experienced a posterior dislocation; it is not so perhaps in Switzerland, in the perimetre of the action of the Alps, where the torrential deposits, the cones of dejection, etc., have acted upon the surface of the soil, and have changed the regular order of superposition.

“Thus, in Alsace, the lehm or loess of the plain corresponds synchronously with the ancient moraines of the valleys of the Vosges.

“Accordingly it seems to me that the following parallel may be established.

In the north-east of France, lehm.

Middle deposits of sand and gravel, known by the name of red diluvium, (valley of the Somme, the Seine, the Marne).

Inferior deposit, gravel derived from a great distance, containing at the base flint implements and the bones of extinct animals.

In the valley of the Rhine, lehm and moraines in the mountains.

Middle deposit, gravel composed of materials not derived from a great distance; anterior to the ancient glaciers.

Inferior deposit, gravel, rolled stones, exclusively from the rocks of Alpine origin, prior to the ancient glacier.

“It results from this analogy that the remains of human industry in the valleys of the Somme, Seine, etc., correspond with the inferior diluvium of the valley of the Rhine, a deposit which is much anterior to the ancient glaciers of the Vosges, as it is separated from them by the middle diluvium of the Rhine, or the red diluvium of the valley of the Seine. Man has thus existed anterior to the ancient glaciers, and was the contemporary of the mammoth, etc., and other extinct animals, the remains of which are found associated with human implements. I have selected for comparison the ancient glaciers of the Vosges, as their relations with the dépôts of the plain of Alsace seem clear and decided. It may, perhaps, be premature to apply the same reasoning to the ancient glaciers of the Alps, since it is not proved that they have disappeared at the same time. They may have persisted for thousands of years after the fusion of those of the Vosges, they may also have originated thousands of years before those of the Vosges, on account of the orographic difference of the two regions.

M. Gaudin says:\* “On the contemporaneous vegetation of primitive man, M. Collomb admits that man existed before the glacial period. M. Lartet sustains that the greater portion of the existing

\* “On the Contemporaneous Vegetation of the Primitive Man.” Letter by C. I. N. Gaudin to Professor Alph. de Candolle; *Bibliothèque Univ.*, vol. viii, 1860.

animal population of our continent has passed through all the phases of the quaternary period.

“On a *resumé* as regards the terrestrial fauna, we arrive at the following conclusions:

“1. Some genera of mammals are no longer found in Europe, (Elephant, rhinoceros, hyæna, etc).

“2. Certain species are entirely extinct. (*Elephas primigenius*, *Rhinoceros tichorhinus*, *Ursus spelæus*, etc.)

“3. Other species have continued to live in their respective regions, or in neighbouring countries. (*Ursus Arctos*, *Bos Urus*, *Cervus Tarandus*, etc.)

“Have the geological and climatic causes which produced these changes equally modified the flora which existed at the period when the great mammals became extinct? In other words, were the forests frequented by the men who fashioned the flints in France, England, etc., composed of the same species of trees which constitute the actual vegetation?

“The examination of the fossil impressions collected by Marquis Strozzi in the travertines of Tuscany prove that considerable modifications have been produced in vegetation. We may say that the changes in the flora and the fauna are parallel.

“1. Certain genera of plants which flourished in Europe at the period of the huge mammals are no longer indigenous in this part of the world. Such are the genera *Thuja*, *Liquidambar*, and *Juglans*.

“2. Some species are entirely extinct (*Thuja saviana*, *Juglans paviaefolia* Gaud.)

“3. Others exist still in Europe, near the beds where they have been found.

“Struck by this parallelism, I have long suspected that the modifications in the fauna and flora were effected at the same epoch.

“Very recently Mr. Penzi, of Rome, found in the travertines of Tivoli and Monticelli human teeth associated with the remains of the hyæna and other mammals. He considers this bed as belonging to the second pleistocene period, in the rocks of which near Rome large pachydermata have been found.

“In conclusion, the deposits of the travertines and tufas, characterized by their containing the bones of the large mammals contemporary with man, contain also a vegetation somewhat differing from that of our present forests.

“Some genera which then inhabited Europe are no longer met with, and these are chiefly American types, or those of the Atlantic islands.”

“Some genera have completely disappeared from the surface of the globe, whilst the major part have not ceased to inhabit the same stations, or have migrated to neighbouring countries. The fossil animals which contain some leaves, prove that the deposits are either anterior or contemporaneous with the glacial period.

“I arrive thus as regards the vegetable world at the same conclusions as Lartet with respect to the animal world.

“The major portion of the vegetable population of our continent has traversed all the phases of the quaternary period, and that man could thus have existed as well as the vegetable world of our continent.”

M. Gosse presented to the Anthropological Society of Paris seventy-one worked flints of various shapes. First a magnificent hatchet resembling those found by M. Boucher de Perthes, at Abbeville, but much larger, being not less than nineteen centimetres in length. To obviate any objection as to the nature and age of the bed, M. Gosse requested M. Hébert, Professor of Geology, to accompany him in his explorations of the quarry of the Rue de Grenelle. Professor Hébert states, positively, that the hatchet was extracted from the bed called the *inferior diluvium*, the thickness of which is about four feet and a half, situated about fifteen feet beneath the surface of the soil. It is noteworthy that scarcely any flints were found in the superior bed. In the same stratum were found a large number fossil bones, according to M. Lartet, the remains of the *Elephas primigenius*, *Bos primigenius*, the fossil horse, and a large carnivorous animal resembling the cavern felis. There were also extracted about seventy knives, wedges, arrowheads, etc. Some of the hatchets were only partially worked. The natural shapes of the flints appear to have been taken advantage of. There are at present about twelve gravel pits in Paris and its environs where flint implements are found.

Mr. Prestwich, in writing to M. Boucher de Perthes, says :\*—“In writing to you a few days since, I forgot to state the opinion I have formed as regards the bed in which the flint hatchets are found.

“With regard to the workmanship of those you have shown to me, and which I have myself procured at Abbeville and Amiens, I have not the least doubt of their being worked by man.

“After having attentively examined the beds of Moulin Quignon, St. Gilles, Abbeville, Saint Acheul, and Amiens, I have the conviction that the opinion you advanced in 1847 in your work on Celtic and antediluvian antiquities, that these hatchets are situated in undisturbed ground associated with the bones of the large mammalia, is just and

\* May 14th, 1850.

well founded. With regard to the bed at Menchecourt, the fact appears to me not so certain; yet I can detect no error.

“Permit me to observe that before my voyage I entertained the strongest doubts on the subject of the beds, and I am very happy to have convinced myself by searching for the truth of so important a fact.”

In another letter to M. Boucher, dated June 8th, 1859, Mr. Prestwich writes:—“Though I returned fully convinced that the flint hatchets were truly from the diluvium, still I desired to find one myself, and that in the presence of other members of the Geological Society of London. I accordingly left ten days ago, accompanied by my friends, Messrs. Godwin-Austen, J. W. Flower, and R. W. Mylne. We went to work early the following morning, and after having closely examined the quarry at St. Acheul, Mr. Flower discovered and detached with his own hands, at a depth of twenty feet, a beautiful hatchet well worked, of the length of about twenty-five centimeters. It was found in an ochreous seam, beneath the white gravel, whence I extracted another hatchet. Above the gravel was a layer of sand with fresh water and land shells, then brown clay, gravel, and brick-earth. All was in the best order and undisturbed. It was beyond a doubt virgin soil. This discovery removed all doubts from the minds of my friends; and I believe we are all agreed as to the truth of which you have been the first exponent, and which you have vindicated for the last ten years, and of which I am happy to have been a witness.”

Mr. Prestwich gives the following description of the gravel-beds of St. Acheul, capping a low chalk hill, a mile south-east of the city of Amiens, about one hundred feet above the level of the Somme, and not commanded by any higher ground. The following is the succession of the beds in descending order.

1. Brown brick-earth (many old tombs and some coins), with irregular bed of flint-gravel. No organic remains. Average thickness, ten to fifteen feet.

2 *a*. Whitish marl and sand, with small chalk débris. Land and fresh-water shells (all of recent species) are common, and mammalian bones and teeth are occasionally found. Average thickness, two to eight feet.

2 *b*. Coarse subangular flint gravel, white with irregular ochreous and ferruginous seams, with tertiary flint pebbles, and small sandstone blocks. Remains of shells, as above, in patches of sand. Teeth and bones of the elephant, and of a species of horse, ox, and deer,—generally near base. This bed is further remarkable for containing worked flints. Average thickness, six to twelve feet.

Mr. Prestwich, in his paper read before the Royal Society, May

26th, 1859, abstaining from all theoretical speculation, confines himself simply to the corroboration of the facts:—

1. That the flint implements are the work of man.
2. That they were found in undisturbed ground.
3. That they are associated with the remains of extinct mammalia.
4. That the period was a late geological one, and anterior to the surface assuming its present outline, so far as some of its minor features are concerned.

Lord Wrottesley writes: \*—“Another independent proof of the great age of the gravel on the banks of the Somme, is derived from the large deposit of peat, the oldest portion of which belongs to times far beyond those of tradition; yet distinguished geologists are of opinion the growth of all the vegetable matter, and even the original scooping out of the hollows, are events long posterior in date to the gravel with flint implements, nay, posterior even to the formation of the layers of loam with freshwater shells overlying the gravel.”

Sir R. Murchison says: † “Whilst the geological geographer who visits the banks of the Somme, and sees such an assemblage of relics beneath great accumulations formed by water (as I have recently witnessed myself), he is compelled to infer, when such a phenomenon was brought about, the waters, which have now diminished to an ordinary and small river, had risen in great inundations to the height of one hundred feet and more above the present stream, and swept over the slopes of the chalk in which the primeval inhabitants were fashioning their rude flint instruments, and when, as I would suggest, they escaped to the adjacent hills, and saving themselves from the sweeping flood, left no traces of their bones in the silt, sand, and gravel.”

Sir Charles Lyell says: ‡ “I am fully prepared to corroborate the conclusions which have been recently laid before the Royal Society by Mr. Prestwich, in regard to the age of the flint implements associated in undisturbed gravel, in the north of France, with the bones of elephants at Abbeville and Amiens. . . . I infer that a tribe of savages, to whom the use of iron was unknown, made a long sojourn in this region; and I am reminded of a large Indian mound, which I saw at St. Simon's island in Georgia—a mound ten acres in area, and having an average height of five feet, chiefly composed of cast away oyster shells, throughout which arrow heads, stone axes, and Indian pottery are dispersed. If the neighbouring river, the Alatomaha, or the sea

\* Lord Wrottesley in his Address at the Oxford Meeting of the British Association, 1860.

† Sir R. Murchison in his Address to the Geographical and Ethnological Section of the British Association at Oxford, 1860.

‡ Sir Charles Lyell's Address at the British Association, at Aberdeen, 1859.

which is at hand, should invade, sweep away, and stratify the contents of this mound, it might produce a very analogous accumulation of human implements, unmixed, perhaps, with human bones. . . . Lastly, the disappearance of the elephant, rhinoceros, and other genera of quadrupeds, implies in like manner a vast lapse of ages, separating the era in which the fossil implements were framed, and that of the invasion of Gaul by the Romans."

Assuming, now, that the worked flint theory is established by such strong evidence, as to amount to demonstration, there arise two very interesting questions: first, if possible, to determine the period in which these implements were fashioned, and the race of men who fabricated them.

It is not easy to give anything like a satisfactory answer to these queries, for in our present state of knowledge we possess no data to infer from. This much seems certain, that the race who worked the drift flints must have lived at a very remote time, cycles of ages anterior to the so-called Celtic period. Sir Charles Lyell\* observes on this point. "All the evidence now before us on these flint implements, and on the circumstances under which they were found, would indicate that the people who made them must have occupied this site before the Straits of Dover were excavated."

It remains for geologists approximatively to determine the period when that event occurred.

M. George Pouchet † visited Saint Acheul, August 25, 1859. The workmen promised to call him as soon as they could find a "*langue de chat*," or cat's tongue, the name given by the miners to the flint hatchets. A few hours had scarcely elapsed when M. Pouchet was called for, and shown one; he, however, immediately perceived that it was a deception, and that the flint had been fraudulently introduced into an artificial cavity. After five days he was called again. This time he saw a hatchet imbedded in the diluvium under such conditions that a mystification was out of the question. After removing the flint from the diluvium he found that it had been worked, and must have been worked at a period anterior to the formation of the bed above it. Besides the stone hatchet which M. Pouchet had extracted himself, he saw many which had been dug out before his arrival. Some of these were spurious, others were perfectly genuine. Pouchet indicates an important character to distinguish the latter. In the course of centuries infiltrations reached the diluvium, depositing a crust of carbonate of lime, of about one millimetre in thickness,

\* Opening Address, Aberdeen, 1859.

† Bulletin de la Société de la Anthropologie, November 3rd, 1859, p. 44.

upon the inferior surface of the flints in this bed. This crust is seen upon all the genuine hatchets at Saint Acheul, and is absent in the spurious hatchets fabricated by the miners. Some few of the genuine hatchets have, moreover, a characteristic peculiarity, that upon the surface, not covered by a calcareous deposit, dendritic impressions are seen, attesting the high, the great antiquity of the section.

Thus, continues M. Pouchet, the bed called diluvium contains, at Amiens, Abbeville, and in other spots of the basin of the Somme, objects worked by the hand of man, at a period long anterior to that usually assigned to man's apparition upon the earth. It has been pretended that the bed was not a real diluvium, but must have been formed since the commencement of the actual period. The fact, however, that in the same bed containing the hatchets, bones and teeth of the elephant, etc., have been found, proves, at any rate, that man inhabited the north of France simultaneously with the elephant. No human bones, it is true, have as yet been found. The remains of elephants have been, on account of their large dimensions, collected by the miners, while they carelessly cast aside the smaller bones. It is not known whether the diluvium of Saint Acheul does not contain human bones. M. Pouchet is convinced they will yet be found. This would complete the evidence, but is not absolutely requisite, as the existence of man is sufficiently attested by his works.

*M. G. St. Hilaire* said: I am not going to treat of the question of the "fossil man," but I believe that the question will soon be answered in the affirmative. There are already a sufficient number of facts which would be considered as conclusive, were the question confined to any other animal. Human bones have certainly been found in such positions, and with such characters, that no one would have thought to deny their being real fossils if they had belonged to the elephant or ox. But as the question related to man, and was an opposition to an idea accredited in science, many have tortured themselves to find sufficient reasons for rejecting them; and various hypotheses, some the most improbable, have to explain the intrusion of human bones in fossiliferous caverns and strata.\*

As to the race who fabricated the flints, all opinions are simply the wildest conjectures; some think that the Iberians, who have been supplanted and nearly destroyed by the invading Celts, were the fabricators, whilst others attribute the implements to an extinct primitive race who are supposed to have lived long before the diluvial beds were formed—an inferior race, the relics of which, found by Professor Spring, in Belgium, he describes as follows.

\* Société d'Anthropologie.

Cranium very small absolutely; very small also when compared with the large development of the jaws; forehead receding, temples flattened, nostrils large, dental arches very voluminous, supporting oblique teeth; facial angle about 70 degrees. The bones of the limbs short, indicating a stature not quite as high as that of the Lapps. And here it may be mentioned that while crania presenting the African type, have been found in various parts of the Continent, as in Baden; those found on the borders of the Danube and the Rhine, approach the shape of the crania of the Caribs.

The skulls found at Kréms, in Austria, and at Lahr, in the valley of the Rhine, in the marl of the old alluvium, are also described as resembling those of the Caribs and Chilenos.

Surprising facts give rise to still more surprising theories; we are, then, by no means astonished that to explain the presence of these skulls, it has been broadly stated that the skulls belonged to natives of America, who had been brought to Europe and presented to the Spanish and German courts after the Conquest of the New World. How these skulls became mingled with the bones of the extinct animals is, however, left to the imagination.

Dr. Schmerling\* found in several caverns on the banks of the Meuse, especially in the caverns of Engis and Engihoul, a quantity of human fossils, associated with the bones of extinct animals, and worked flints. Some of the crania approach the African type. He expresses his conviction that these crania belonged to individuals whose intellectual capacities were little developed. The colour, the degree of decomposition of the human bones is not in any way different from those of other animals; he concludes that the human remains have been buried in these caverns at the same epoch as the remains of extinct animals. What struck him most was the presence of flints of variable size, the forms of which were so regular that it is impossible to confound them with those found usually in the chalk. It cannot but be admitted that these flints were worked by the hand of man and may have served as arrows or knives. He attaches immense importance to the presence of these flints, for even if no human bones had been found in conditions favourable to the opinion that they belong to the antediluvian period the proof would have been furnished by the fashioned flint. He concludes, by expressing his conviction, that time will decide whether he is right to express himself in such a categorical manner.

De Saulcy, the celebrated French antiquary and traveller, has given a description of the remarkable brick-soil of Marsal, in Lorraine,

\* *Recherches sur les Ossements Fossiles*, Liège, 1846.

which was once inhabited by a pre-Celtic race. The valley, *de la Seille*, appears to have been originally a large marsh, perfectly unfit for human habitation. An unknown tribe of immigrants seem, for some reasons, to have selected this enclosed valley for a settlement. They consequently softened the clay of the surrounding hills, shaped it into lumps, burned them, and sunk millions of these bricks into the marsh, until the soil became sufficiently firm, not merely to bear their habitations, but the present towns—Dieuze, Marsal, etc., which now occupy the locality. This subterraneous work is called the *briquetage de Marsal*. It has been calculated that 4000 workmen, labouring eight hours daily, would require twenty-five years merely to prepare the bricks for burning. How long it took that primitive people to perform the task, is not easy to say.

*Primitive Inhabitants of the North of Europe.*—The supposition of pre-Celtic populations of Europe gains daily more ground. Professor Nilsson, of Lund, is of opinion that the southern parts of Sweden were formerly connected with Denmark and Germany. As vegetation increased, graminivorous animals came from the south; these were followed by carnivora, and finally, by man, who was contemporary with the primeval ox (*Bos primigenius*), and the cave bear. He adduces, as a proof, that they possess in Lund, a skeleton of the primitive ox pierced by an arrow, and another of a bear found under a gravel deposit, along with stone and bone implements, for hunting and fishing.

The skulls of this primitive race are short, and present the brachycephalic form of Retzius. The parietal tubers are prominent, and the occiput broad and flattened. This race seems to have been succeeded by another with a cranium of a more lengthened oval form, and a prominent and narrow occiput (Dolichocephalic of Retzius). The third race, with a longer cranium than that of the second, and marked by greater prominence at the sides, is, by Nilsson, considered to have been of Celtic origin, who have introduced the use of bronze. Finally, there came the true Swea, introducing weapons of iron, from which the present Scandinavians are descended. The settlement of this race occurred sometime in the sixth century.

The skull, which was found in 1857, in the gorge of the Neanderthal, between Düsseldorf and Elberfeld, has excited much attention amongst anatomists. No satisfactory proof of its geological antiquity has been afforded us, as it was only found in a cave about sixty feet above the stream of the Düssel, with a fissure partially filled with mud and stones, extending from the cave to the upper surface of the country, and through which the skeleton was probably washed. The loam in

which it was found, on the base of the cave, was five feet thick. The cranium exhibits many remarkable analogies to that of the chimpanzee, and has been stated by Professor Huxley to be the most ape-like skull he ever beheld. According to Professor Huxley, it resembles those of the apes, not only in the prodigious development of the superciliary prominences and the forward extension of the orbits, but still more in the depressed form of the brain-case, in the straightness of "the squamosal suture, and in the complete retreat of the occiput forward and upward, from the superior occipital ridges." The capacity of the skull was equal to the mean deduced from the comparison of the highest and the lowest human skulls. Professor Huxley, calling attention to the amount of variation between the skulls of the Australian race, warns cautious reasoners not rashly to affirm that the Neanderthal and Engis skulls were necessarily of distinct races. At the same time, he does not affirm that the Engis and Neanderthal skulls belong to the Australian race, or that the ancient skulls belong to one and the same race.

Professor Waitz, of Marburg, has in his latest work,\* the following observations in relation to the antiquity of man.

"The exact period of man's appearance on the globe cannot be determined, but that it must be very remote from the adopted historical human period is for many reasons all but certain."

"Geology may, perhaps, furnish us some data. Thus, the age of the coal formation is by some computed to lie between five and nine millions of years. This calculation by no means appears to be exaggerated. Lyell, on the other hand, has calculated that the formation of the valley of the Niagara, which is much more recent than the diluvial deposits, required at least 35,000 years for its formation.

"Now, though it may be admitted that it has not as yet been proved that the age of man reaches much beyond the diluvial formation, there is still less reason to believe that he appeared later, inasmuch as no general change of the surface of the earth has since taken place, and as all the essential conditions for man's existence were then present. It seems, therefore, that we are justified to assume the age of man to be between the extreme limits of 35,000 and 9,000,000 years."

"It must be acknowledged, that the Professor, by thus soaring into infinite time far beyond our ken, takes rather the safe side of the question. At any rate, he seems merely to say that there is presumptive geological evidence that humanity is not younger than 35,000 years.

*Primitive Inhabitants of the British Isles.*—The ancient inhabitants of Britain seem to have been closely connected with those of Scandin-

\* *Anthropologie der Naturvölker*, 1860.

avia. Dr. Wilde\* thinks that there is sufficient evidence to believe that Ireland has at different and remote periods been inhabited by at least two if not three distinct races, the first of which was characterised by a short and the second by an elongated form of skull, corresponding in character and succession to the Aborigines of Scandinavia. Dr. Daniel Wilson, in his work,† is of opinion that the most ancient of the extinct pre-celtic races of Scotland were men with boat-shaped kumbecephalic skulls, the second race of Nilsson. These lived in the stone period. The short-heads lived after them; both were destroyed or displaced by the Celts in the bronze period; and, in their turn, gave way to the Norwegians, who introduced iron.

*Intelligence of Primitive Races.*—That the mere rudeness of workmanship in the implements left us by the antehistoric or aboriginal peoples, does not necessarily lead to the inference that they were physically and morally inferior to succeeding races, must be admitted, for it may be doubted, that supposing a number of the present intelligent audience were suddenly cast away upon some desert island, deprived of the least use of metal or of the means to procure it, whether they could, by mere percussion, and friction, manufacture objects either more perfect, or more adapted to the purpose intended than the rude implements of the antehistoric race. As, therefore, we cannot judge of them by their works, we must search for other indications of their supposed mental capacities.

It is generally admitted that the mental superiority of man depends on the development and structure of his brain, and that the manifestation of intellect and the capacity for improvement is closely connected with the cerebral structure. It is also mostly allowed that examination of the interior of the skull gives a fair index of the size and shape of the brain.

Hence, our chief anthropologists have adopted the particular shape of the cranium as the great mark of distinction between the different races of man.

Premature as the inference may be, still if we are to judge of the smallness of the skull, the development of the jaws, and other abnormalities of the crania, found mingled with fossil-bones and flint implements, the conclusion is not altogether unfounded that the original races were inferior to the succeeding immigrants, and also that the primitive race is now extinct in Europe, and has shared the fate of the gigantic animals with which it was contemporaneous.

\* *Ethnology of the Ancient Irish.*

† *Pre-Celtic Annals of Scotland.*

## ON THE RELATIONS OF MAN TO THE INFERIOR ANIMALS.\*

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PROFESSOR HUXLEY has recently published a small volume of essays which seem destined to create no little sensation amongst the British public. Whatever, however, may be its present popularity, it is not a work like Darwin's *Origin of Species*, born to a somewhat enduring fame. Professor Huxley has lost a grand chance of now producing a book which would be for a quarter of a century connected with his name; but instead of writing a serious and painstaking work he has published three very incomplete essays. We are sorry for Professor Huxley's fame that he should have done this; because the time has, perhaps, now come when a great deal of the evidence on this subject could be brought together. However, the work is published, and we must now give our readers some account of its contents. The first chapter is on the natural history of the man-like apes, chiefly taken from Dr. Savage and Mr. Wallace. We then have a note, with a well-known woodcut from Pigafetta, respecting African cannibalism in the sixteenth century. We have only to observe that this is most unnecessarily introduced at this place. Then comes the second, and most important chapter in the book, on the relation of man to the lower animals.

We shall let Professor Huxley, as far as possible, speak for himself. He thus introduces this subject.

“The question of questions for mankind—the problem which underlies all others, and is more deeply interesting than any other—is the ascertainment of the place which Man occupies in nature and of his relations to the universe of things. Whence our race has come; what are the limits of our power over nature, and of nature's power over us; to what goal we are tending; are the problems which present themselves anew and with undiminished interest to every man born into the world. Most of us, shrinking from the difficulties and dangers which beset the seeker after original answers to these riddles, are contented to ignore them altogether, or to smother the investigating spirit under the featherbed of respected and respectable tradition. But, in every age, one or two restless spirits, blessed with that constructive genius, which can only build on a secure foundation, or cursed with the mere spirit of scepticism, are unable to follow in the well-worn and comfortable track of their forefathers and contem-

\* *Man's Place in Nature*, by T. H. Huxley, 1863.

poraries, and unmindful of thorns and stumbling-blocks, strike out into paths of their own. The sceptics end in the infidelity which asserts the problem to be insoluble, or in the atheism which denies the existence of any orderly progress and governance of things: the men of genius propound solutions which grow into systems of Theology or of Philosophy, or veiled in musical language which suggests more than it asserts, take the shape of the Poetry of an epoch.

"Each such answer to the great question, invariably asserted by the followers of its propounder, if not by himself, to be complete and final, remains in high authority and esteem, it may be for one century, or it may be for twenty: but, as invariably, Time proves each reply to have been a mere approximation to the truth—tolerable chiefly on account of the ignorance of those by whom it was accepted, and wholly intolerable when tested by the larger knowledge of their successors.

"In a well-worn metaphor, a parallel is drawn between the life of man and the metamorphosis of the caterpillar into the butterfly; but the comparison may be more just as well as more novel, if for its former term we take the mental progress of the race. History shows that the human mind, fed by constant accessions of knowledge, periodically grows too large for its theoretical coverings, and bursts them asunder to appear in new habiliments, as the feeding and growing grub, at intervals, casts its too narrow skin and assumes another, itself but temporary. Truly the imago state of Man seems to be terribly distant, but every moult is a step gained, and of such there have been many.

"Since the revival of learning, whereby the Western races of Europe were enabled to enter upon that progress towards true knowledge, which was commenced by the philosophers of Greece, but was almost arrested in subsequent long ages of intellectual stagnation, or, at most, gyration, the human larva has been feeding vigorously, and moulting in proportion. A skin of some dimension was cast in the sixteenth century, and another towards the end of the eighteenth, while, within the last fifty years, the extraordinary growth of every department of physical science has spread among us mental food of so nutritious and stimulating a character that a new ecdysis seems imminent. But this is a process not unusually accompanied by many throes and some sickness and debility, or, it may be, by graver disturbances; so that every good citizen must feel bound to facilitate the process, and even if he have nothing but a scalpel to work withal, to ease the cracking integument to the best of his ability."

After touching on the development of the lower vertebrate animals, "one turns with impatience to inquire what results are yielded by the study of the development of man. Is he something apart?"

Professor Huxley continues.

"It is quite certain that the Ape which most nearly approaches man, in the totality of its organization, is either the Chimpanzee or the Gorilla; and as it makes no practical difference, for the purposes of

my present argument, which is selected for comparison, on the one hand, with Man, and on the other hand, with the rest of the Primates, I shall select the latter (so far as its organization is known)—as a brute now so celebrated in prose and verse, that all must have heard of him, and have formed some conception of his appearance. I shall take up as many of the most important points of difference between man and this remarkable creature, as the space at my disposal will allow me to discuss, and the necessities of the argument demand; and I shall inquire into the value and magnitude of these differences, when placed side by side with those which separate the Gorilla from other animals of the same order.

“In the general proportions of the body and limbs there is a remarkable difference between the Gorilla and Man, which at once strikes the eye. The Gorilla’s brain-case is smaller, its trunk larger, its lower limbs shorter, its upper limbs longer in proportion than those of Man.

“I find that the vertebral column of a full grown Gorilla, in the Museum of the Royal College of Surgeons, measures 27 inches along its anterior curvature, from the upper edge of the atlas, or first vertebra of the neck, to the lower extremity of the sacrum; that the arm, without the hand, is  $31\frac{1}{2}$  inches long; that the leg, without the foot, is  $26\frac{1}{2}$  inches long; that the hand is  $9\frac{1}{4}$  inches long; the foot  $11\frac{3}{4}$  inches long.

“In other words, taking the length of the spinal column as 100, the arm equals 115, the leg 96, the hand 36, and the foot 41.

“In the skeleton of a male Bosjesman, in the same collection, the proportions, by the same measurement, to the spinal column, taken as 100, are—the arm 78, the leg 110, the hand 26, and the foot 32. In a woman of the same race the arm is 83, and the leg 120, the hand and foot remaining the same. In a European skeleton I find the arm to be 80, the leg 117, the hand 26, and the foot 35.

“Thus the leg is not so different as it looks at first sight, in its proportions to the spine in the Gorilla and in the Man—being very slightly shorter than the spine in the former, and between 1-10th and 1-5th longer than the spine in the latter. The foot is longer and the hand much longer in the Gorilla; but the great difference is caused by the arms, which are very much longer than the spine in the Gorilla, very much shorter than the spine in Man.

“The question now arises how are the other apes related to the Gorilla in these respects—taking the length of the spine, measured in the same way, at 100. In an adult Chimpanzee, the arm is only 96, the leg 90, the hand 43, the foot 39—so that the hand and the leg depart more from the human proportion and the arm less, while the foot is about the same as in the Gorilla.

“In the Orang, the arms are very much longer than in the Gorilla (122), while the legs are shorter (88); the foot is longer than the hand (52 and 48), and both are much longer in proportion to the spine.

“In the other man-like Apes again, the Gibbons, these proportions are still further altered; the length of the arms being to that of the spinal column as 19 to 11; while the legs are also a third longer than

the spinal column, so as to be longer than in Man, instead of shorter. The hand is half as long as the spinal column, and the foot, shorter than the hand, is about 5-11ths of the length of the spinal column.

"Thus *Hylobates* is as much longer in the arms than the Gorilla, as the Gorilla is longer in the arms than Man; while, on the other hand, it is as much longer in the legs than the Man, as the Man is longer in the legs than the Gorilla, so that it contains within itself the extremest deviations from the average length of both pairs of limbs.

"The Mandrill presents a middle condition, the arms and legs being nearly equal in length, and both being shorter than the spinal column; while hand and foot have nearly the same proportions to one another and to the spine, as in man.

"In the Spider monkey, (*Ateles*) the leg is longer than the spine, and the arm than the leg; and, finally, in that remarkable Lemurine form, the Indri, (*Lichanotus*) the leg is about as long as the spinal column, while the arm is not more than 11-18ths of its length; the hand having rather less and the foot rather more, than one-third the length of the spinal column.

"These examples might be greatly multiplied, but they suffice to show that, in whatever proportion of its limbs the Gorilla differs from Man, the other Apes depart still more widely from the Gorilla and that, consequently, such differences of proportion can have no ordinal value."

After touching on the difference of human crania, the author observes:

"Thus, even in the important matter of cranial capacity, Men differ more widely from one another than they do from the Apes; while the lowest Apes differ as much, in proportion, from the highest, as the latter does from Man. The last proposition is still better illustrated by the study of the modifications which other parts of the cranium undergo in the Simian series."

A comparative examination is then made of the dental characters, the hand, and the foot of man and apes. When speaking of the brain of man, the author observes:

"When the gravest errors respecting points so easily settled as this question respecting the posterior lobes, can be authoritatively pronounced, it is no wonder that matters of observation, of no very complex character, but still requiring a certain amount of care, should have fared worse. Any one who cannot see the posterior lobe in an ape's brain is not likely to give a very valuable opinion respecting the posterior cornu or the hippocampus minor. If a man cannot see a church, it is preposterous to take his opinion about its altar-piece or painted window—so that I do not feel bound to enter upon any discussion of these points, but content myself with assuring the reader that the posterior cornu and the hippocampus minor, have now been seen—usually, at least as well developed as in man, and often better—not only in the Chimpanzee, the Orang, and the Gibbon, but in all

the genera of the old world baboons and monkeys, and in most of the new world forms, including the Marmosets.

“In fact, all the abundant and trustworthy evidence (consisting of the results of careful investigations directed to the determination of these very questions, by skilled anatomists), which we now possess, leads to the conviction that, so far from the posterior lobe, the posterior cornu, and the hippocampus minor, being structures peculiar to and characteristic of man, as they have been over and over again asserted to be, even after the publication of the clearest demonstration of the reverse, it is precisely these structures which are the most marked cerebral characters common to man with the apes. They are among the most distinctly Simian peculiarities which the human organism exhibits.”

Again, we read.

“So far as cerebral structure goes, therefore, it is clear that Man differs less from the Chimpanzee or the Orang, than these do even from the Monkeys, and that the difference between the brains of the Chimpanzee and of Man is almost insignificant, when compared with that between the Chimpanzee brain and that of a Lemur.

“It must not be overlooked, however, that there is a very striking difference in absolute mass and weight between the lowest human brain and that of the highest ape—a difference which is all the more remarkable when we recollect that a full grown Gorilla is probably pretty nearly twice as heavy as a Bosjesman, or as many an European woman. It may be doubted whether a healthy human adult brain ever weighed less than thirty-one or -two ounces, or that the heaviest Gorilla brain has exceeded twenty ounces.

“This is a very noteworthy circumstance, and doubtless will one day help to furnish an explanation of the great gulf which intervenes between the lowest man and the highest ape in intellectual power; but it has little systematic value, for the simple reason that, as may be concluded from what has already been said respecting cranial capacity, the difference in weight of brain between the highest and the lowest men is far greater, both relatively and absolutely, than that between the lowest man and the highest ape.”

On this subject, Professor Huxley makes the following note, which will afford a subject for future discussion.

“I say *help* to furnish: for I by no means believe that it was any original difference of cerebral quality, or quantity, which caused that divergence between the human and the pithecoïd stirpes, which has ended in the present enormous gulf between them. It is no doubt perfectly true, in a certain sense, that all difference of function is a result of difference of structure; or, in other words, of difference in the combination of the primary molecular forces of living substance; and, starting from this undeniable axiom, objectors occasionally, and with much seeming plausibility, argue that the vast intellectual chasm between the Ape and Man implies a corresponding structural chasm in the organs of the intellectual functions; so that, it is said, the non-

discovery of such vast differences proves, not that they are absent, but that Science is incompetent to detect them. A very little consideration, however, will, I think, show the fallacy of this reasoning. Its validity hangs upon the assumption, that intellectual power depends altogether on the brain—whereas the brain is only one condition out of many on which intellectual manifestations depend; the others being, chiefly, the organs of the senses and the motor apparatuses, especially those which are concerned in prehension and in the production of articulate speech.

“A man born dumb, notwithstanding his great cerebral mass and his inheritance of strong intellectual instincts, would be capable of few higher intellectual manifestations than an Orang or a Chimpanzee, if he were confined to the society of dumb associates. And yet there might not be the slightest discernible difference between his brain and that of a highly intelligent and cultivated person. The dumbness might be the result of a defective structure of the mouth, or of the tongue, or a mere defective innervation of these parts; or it might result from congenital deafness, caused by some minute defect of the internal ear, which only a careful anatomist could discover.

“The argument, that because there is an immense difference between a Man's intelligence and an Ape's, therefore, there must be an equally immense difference between their brains, appears to me to be about as well based as the reasoning by which one should endeavour to prove that, because there is a ‘great gulf’ between a watch that keeps accurate time and another that will not go at all, there is therefore a great structural hiatus between the two watches. A hair in the balance-wheel, a little rust on a pinion, a bend in a tooth of the escapement, a something so slight that only the practised eye of the watchmaker can discover it, may be the source of all the difference.

“And believing, as I do, with Cuvier, that the possession of articulate speech is the grand distinctive character of man (whether it be absolutely peculiar to him or not), I find it very easy to comprehend, that some equally inconspicuous structural difference may have been the primary cause of the immeasurable and practically infinite divergence of the Human and the Simian Stirps.”

Professor Huxley says, on the origin of species—

“I adopt Mr. Darwin's hypothesis, therefore, subject to the production of proof that physiological species may be produced by selective breeding; just as a physical philosopher may accept the undulatory theory of light, subject to the proof of the existence of the hypothetical ether; or as the chemist adopts the atomic theory, subject to the proof of the existence of atoms; and for exactly the same reasons, namely, that it has an immense amount of *primâ facie* probability: that it is the only means at present within reach of reducing the chaos of observed facts to order; and lastly, that it is the most powerful instrument of investigation which has been presented to naturalists since the invention of the natural system of classification, and the commencement of the systematic study of embryology.”

The following note appears at p. 109.

“ It is so rare a pleasure for me to find Professor Owen’s opinions in entire accordance with my own, that I cannot forbear from quoting a paragraph which appeared in his essay ‘ On the Characters, etc., of the Class Mammalia,’ in the *Journal of the Proceedings of the Linnean Society of London*, for 1857, but is unaccountably omitted in the ‘ Reade Lecture,’ delivered before the University of Cambridge two years later, which is otherwise nearly a reprint of the paper in question. Professor Owen writes :

“ ‘ Not being able to appreciate or conceive of the distinction between the psychical phenomena of a Chimpanzee and of a Bosjesman or of an Aztec, with arrested brain growth, as being of a nature so essential as to preclude a comparison between them, or as being other than a difference of degree, I cannot shut my eyes to the significance of that all-pervading similitude of structure—every tooth, every bone, strictly homologous—which makes the determination of the difference between *Homo* and *Pithecus* the anatomist’s difficulty.’

“ Surely it is a little singular, that the ‘ anatomist,’ who finds it ‘ difficult’ to ‘ determine the difference’ between *Homo* and *Pithecus*, should yet range them, on anatomical grounds, in distinct subclasses.”

This essay is concluded in the following words.

“ But desiring, as I do, to reach the wider circle of the intelligent public, it would be unworthy cowardice were I to ignore the repugnance with which the majority of my readers are likely to meet the conclusions to which the most careful and conscientious study I have been able to give to this matter has led me.

“ On all sides I shall hear the cry—‘ We are men and women, not a mere better sort of apes, a little longer in the leg, more compact in the foot, and bigger in brain than your brutal Chimpanzees and Gorillas. The power of knowledge—the conscience of good and evil—the pitiful tenderness of human affections, raise us out of all real fellowship with the brutes, however closely they may seem to approximate us.’

“ To this I can only reply that the exclamation would be most just and would have my own entire sympathy, if it were only relevant. But it is not I who seek to base Man’s dignity upon his great toe, or insinuate that we are lost if an Ape has a hippocampus minor. On the contrary, I have done my best to sweep away this vanity. I have endeavoured to show that no absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves ; and I may add the expression of my belief that the attempt to draw a psychical distinction is equally futile, and that even the highest faculties of feeling and of intellect begin to germinate in lower forms of life. At the same time, no one is more strongly convinced than I am of the vastness of the gulf between civilized man and the brutes ; or is more certain that whether *from* them or not, he is assuredly not *of* them. No one is less disposed to think lightly of the present

dignity, or despairingly of the future hopes, of the only consciously intelligent denizen of this world.

“We are indeed told by those who assume the authority in these matters, that the two sets of opinions are incompatible, and that the belief in unity of the origin of man and brutes involves the brutalization and degradation of the former? But is this really so? Could not a sensible child confute, by obvious arguments, the shallow rhetoricians who would force this conclusion upon us? Is it, indeed, true, that the poet, or the philosopher, or the artist whose genius is the glory of his age, is degraded from his high estate by the undoubted historical probability, not to say certainty, that he is the direct descendant of some naked and bestial savage, whose intelligence was just sufficient to make him a little more cunning than the fox, and by so much more dangerous than the tiger? Or is he bound to howl and grovel on all fours because of the wholly unquestionable fact, that he was once an egg, which no ordinary power of discrimination could distinguish from that of a dog? Or is the philanthropist or the saint to give up his endeavours to lead a noble life, because the simplest study of man’s nature reveals, at its foundations, all the selfish passions and fierce appetites of the merest quadruped? Is mother-love vile because a hen shows it, or fidelity base because dogs possess it?”

Here follows “A succinct History of the Controversy respecting the Cerebral Structure of Man and the Apes.” The statement Professor Owen made in 1857, that “the posterior development is so marked, that anatomists have assigned to that part the character of a third lobe; *it is peculiar to the genus homo, and equally peculiar is the posterior horn of the lateral ventricle and the ‘hippocampus minor’ which characterize the hind lobe of each hemisphere,*” is shown to be at variance with the opinion expressed by most other anatomists. Professor Huxley denies all three assertions, and concludes with the following statement.

“For the credit of my calling I should be glad to be, hereafter, for ever silent upon it. But, unfortunately, this is a matter upon which, after all that has occurred, no mistake or confusion of terms is possible—and in affirming that the posterior lobe, the posterior cornu, and the hippocampus minor exist in certain Apes, I am stating either that which is true, or that which I must know to be false. The question has thus become one of personal veracity. For myself, I will accept no other issue than this, grave as it is, to the present controversy.”

We will not enter here into the propriety of inserting these remarks, because we are hardly able to enter into the feelings of the author. At first sight, they appear wanting in good taste; but we are inclined to believe that the author is justified in what he has said. It has been affirmed that this is a personal quarrel, but whatever may be its cause, there can be no doubt it is a most melancholy dispute.

Surely passion has enough fields for exhibition without being introduced into scientific discussion. If we believed this was a personal question, we should do all we could to expose the originator. But it is a matter of fact, opinion, and meaning of words. We hope that the Anthropological Society will appoint an independent (?) committee to report on the real facts of the case, and do their best to put a stop to this unfortunate dispute. But let these quarrels be a warning to all young men. Let them all know that there must be the same honesty in scientific discussions as in any other affairs of life. The scientific man cannot serve two masters. Nor is science in any way advanced by such attempts. On the contrary, a false statement of facts may retard the progress of science for years. What time has not been wasted respecting this dispute! Professor Owen is charged with stating that which he knows to be false. No doubt this is a serious charge: and were it possible for Professor Huxley to demonstrate its truth, we should neither attempt to justify or extenuate it. We take no part either on one side or the other in this dispute; but are bound to give our opinion that at the present time the evidence is chiefly on the side of Professor Huxley respecting the question of facts, unless Professor Owen can show that the meaning of his words has been misinterpreted.

An interesting chapter follows "On some Fossil Remains of Man," principally relating to the Engis and Neanderthal skulls, taken chiefly from Schmerling and Schaaffhausen. This chapter throws very little light on man's place in nature, and there is nothing in these skulls which may not now be found amongst existing savage races.

Professor Huxley makes the following very sensible remark respecting the present state of craniometry in this country.

"Until human crania have been largely worked out in a manner similar to that here suggested—until it shall be an opprobrium to an ethnological collection to possess a single skull which is not bisected longitudinally—until the angles and measurements here mentioned, together with a number of others of which I cannot speak in this place, are determined, and tabulated with reference to the basicranial axis as unity, for large numbers of skulls of the different races of Mankind, I do not think we shall have any very safe basis for that ethnological craniology which aspires to give the anatomical characters of the crania of the different Races of Mankind."

The author is not content with making these observations, but must go on to make the following dangerous generalization.

"At present I believe that the general outlines of what may be safely said upon that subject may be summed up in a very few words.

Draw a line on a globe from the Gold Coast in Western Africa to the steppes of Tartary. At the southern and western end of that line there live the most dolichocephalic, prognathous, curly-haired, dark-skinned of men—the true Negroes. At the northern and eastern end of the same line there live the most brachycephalic, orthognathous, straight-haired, yellow-skinned of men—the Tartars and Calmucks. The two ends of this imaginary line are indeed, so to speak, ethnological antipodes. A line drawn at right angles, or nearly so, to this polar line through Europe and Southern Asia to Hindostan, would give us a sort of equator, around which round-headed, oval-headed, and oblong-headed, prognathous and orthognathous, fair and dark races, but none possessing the excessively marked characters of Calmuck or Negro—group themselves.

“It is worthy of notice that the regions of the antipodal races are antipodal in climate, the greatest contrast the world affords, perhaps, being that between the damp, hot, steaming, alluvial coast plains of the West Coast of Africa and the arid, elevated steppes and plateaux of Central Asia, bitterly cold in winter, and as far from the sea as any part of the world can be.

“From Central Asia eastward to the Pacific Islands and subcontinents on the one hand, and to America on the other, brachycephaly and orthognathism gradually diminish, and are replaced by dolichocephaly and prognathism, less, however, on the American Continent (throughout the whole length of which a rounded type of skull prevails largely, but not exclusively) than in the Pacific region, where, at length, on the Australian Continent and in the adjacent islands, the oblong skull, the projecting jaws, and the dark skin reappear; with so much departure, in other respects, from the Negro type, that ethnologists assign to these people the special title of ‘Negritoes.’”

Professor Huxley concludes the work by asking three questions, which time alone can answer.

“Where, then, must we look for primæval Man? Was the oldest *Homo sapiens* pliocene or miocene, or yet more ancient? In still older strata do the fossilized bones of an Ape more anthropoid, or a Man more pithecoïd, than any yet known, await the researches of some unborn paleontologist?”

Such, then, are specimens of the contents of a book which is destined to exercise no small amount of influence on the popular mind. It is not every man who is both able and willing to write on such a subject in such a way that the public shall be both interested and enlightened. Perhaps, however, the day is not come for a scientific work on such a subject. Therefore, the book is very properly called “evidence” as to man’s place in nature, and, as such, it is a most valuable compilation. There is much, however, omitted which might have been introduced. This will all come in good time. Like all Professor Huxley’s writings, it is clear in style, and decided

in expression. We have not dwelt on the most important point, the *arguments* from the facts adduced; but these will be ample food for discussion at some future day. Professor Huxley shares the weakness of his opponents in wishing to make some rigid distinction between man and animals. The other day, at Cambridge, he spoke of the "mental and moral gulf;" now he believes with Cuvier that the distinction is "articulate speech." We fear that Professor Huxley will have to yield this too as easily—if, indeed, not more easily—than his opponents will have to give up the structural difference. Making the distinction to be "articulate speech," is a sort of "refuge for the destitute,"—a bone thrown to a savage dog.

Professor Huxley seems to have had his conscience pricked when he wrote, "the possession of articulate speech is the grand distinctive character of man," for he adds in parenthesis, "*whether it be absolutely peculiar to man or not.*" We should like to know what is the difference between the "distinctive" character and the "grand distinctive" character? and how articulate speech can be a *distinctive* character at all, if it is not absolutely peculiar to man?

Would it not be better to assert at once that "written language" is the "grand distinctive character"? The only misfortune for such an hypothesis is the fact that some races of man have no written language. We have no hesitation in asserting that Professor Owen's "posterior third lobe," "posterior cornu," and "hippocampus minor," are as "grand distinctive characters" of man as Professor Huxley's "articulate speech." We would advise Professor Huxley to be cautious not to say anything more about the "grand distinctive character," because there really is no such thing: no amount of difference in degree ever amounting to the same thing as a difference in kind.

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## ETHNOLOGY AND PHRENOLOGY.\*

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THE natural history of man has, of late years, excited a more than usual interest, which has drawn numerous inquirers into the field of investigation, who, stimulated with vivid enthusiasm, are prosecuting observation with unwearied zeal, and daily adding to our stock of facts in this important and elevated department of science. No question can be clearer than that man's physical, moral, and intellectual nature is the loftiest and most important subject on which human intellect can be exercised, next to Deity. On our knowledge of this great point depends everything excellent in our laws, government, and social institutions; and, from our ignorance of it, proceed all errors and defects in them. Every advancement in this science, therefore, increases our power of promoting social good, and of remedying social evil. The world is full of wrong and evil, in reality, because man's nature is but little understood, and his history but imperfectly known; much of what is written, and called history, being nothing else than gossip and fable occasionally garnished with florid phrases and pompous eulogies.

The science of man, then, is but at its rudimentary stage, and no great social improvement can be expected till it has made further progress. Race is a term which is found at present in every mouth. No term is more frequently employed by the public speaker, journalist, or historian; but, unhappily, none more frequently abused. Indeed, at the very root of the inquiry, the question occurs, what is man? Is he of one species, or of several? Or does mankind consist of several permanent varieties individually modified by climate, diet, education, and other influences, but never radically altered; one variety never being converted into the other by any known causes; each remaining the same in essential characteristics for thousands of years? Or are all varieties of the human race to be accounted for by the influence of climate, laws, institutions, and education?

These are most important questions; for, according as the one or the other is true, must the laws and institutions, by which mankind are governed, be constituted, if their prosperity and happiness be the object sought. If mankind be one race, the varieties of which are

\* *Ethnology and Phrenology as an Aid to the Historian.* By J. W. Jackson. London: Trübner & Co., 60, Paternoster Row. Edinburgh: Maclachlan & Stewart.

the result of circumstances, it is perfectly evident that there is but one perfect system for the government and social improvement of all nations, and that those which have not come up to this system can be brought to it by enlightenment and training; but if they consist of several races radically distinct, it is sufficiently certain that the prosperity and advancement of each depend on political and social institutions peculiarly adapted to its essential character.

The latter question, that men consist of several distinct races, may be said to be almost inductively established. When this, therefore, is the case, it is altogether absurd any longer to suppose that all these races are to be successfully ruled and developed by similar political and social institutions; for it is clear that in order that a government may be successful with one race, it must be suited to its peculiar character, and when suitable to this character, it is unsuitable to all others which are different from it. The object, then, of every person who would wish to enlighten himself on this interesting branch of knowledge, or who would wish to extend and advance the science for the purpose of rendering it practically useful, is to prosecute the study of the peculiar character of each individual race in order to ascertain its distinctive features, its moral tendencies, and its intellectual capacity.

Although numerous, interesting, and important facts have been collected in connection with this elevated department of knowledge, which throw much light upon it, and which form a basis for curious, pleasing, and entertaining speculation; yet these are by far too few to enable profound scientific thinkers to arrive at satisfactory conclusions, or to construct theories that could be accepted as reliable science by the practical world.

At present numerous inquirers are in the field, and observations on the mental and physical characteristics of different races are carried on with wonderful vigour. Facts are being collected in all quarters of the globe; while the support which these are supposed to give to the various theories, in the meantime afloat in the scientific world, is contested by the opposite theorists with vehemence and pertinacity. Still, it may be said that fully too great stress is laid on facts and observations; while speculation, to any extent beyond these, is, upon the whole, very much discouraged, and, usually, treated with disdain. No doubt, wild and reckless theorising does much damage to the true progress of science, by diverting the mind from the proper channel of truth, and leading it into that of whim and reverie. However, it is not theory, or hypothesis, that does so much injury; but, rather, the

laying down of these as perfectly established science. Speculation does not hurt science but when it is of a dogmatic character.

If we review the history of any department of science, which is, at present, brought to a high degree of excellence, we shall find that, in its advancement to this condition, it has been helped on fully as much by the imagination, as by the understanding. How many of its important truths does chemistry owe to alchemy! And astronomy owes not a little of her wonderful progress to the pursuit of judicial astrology. We laugh at Descartes' vortices; but these lent their aid to that glorious theory which was conceived and propounded by Copernicus, and verified by Newton.

The philosophical Emerson remarks of English works on science, "that all imagination is driven out of them," and "that they are as dry and uninteresting as treatises on conveyancing." This is rather severe, but not without some truth. Our works on science, doubtless, adhere too rigidly to facts; our scientific men strongly discountenance all play of fancy; and this is most assuredly detrimental to the advancement of knowledge. That it may prevent the multiplication of error is pretty certain; but better have a rich soil though it should be troubled with rank weeds, than a poor one even were it entirely free from them. This rigid exclusiveness with respect to theory has, probably, driven many minds into the region of fiction, that would have been fully more usefully employed in extending the bounds of philosophy by bold and original inquiry.

In no department of intellectual pursuit is the exercise of imagination so important, or so much required, as in those sciences which are yet in their infancy; such as ethnology, archæology, philology, and mythonomy. These are all new sciences whose striking and wonderful facts have excited a most vivid interest in the philosophical world. They are all most intimately connected with man's welfare and highest interests. They are, in fact, so many sciences converging towards one point,—man,—so many sciences which, when they have been sufficiently developed in the course of time, will, ultimately, become one. It is highly important, therefore, that the cultivators of these separate, but kindred departments of scientific pursuit should hold this common point of union in view, and mutually cooperate. By doing so their respective labours will, unquestionably, lead to much greater results than can possibly be attained by their individual and independent action. The development of ethnology, undoubtedly, depends on that of the forementioned kindred sciences, and any step of advancement these make will, also, to a certainty, favour its progress.

Before we had hardly any facts to form a basis for this science, voluminous works were written setting down its laws as if it had been as well established as geometry or arithmetic. These books could hardly be said to display much imaginative power, unless prejudice, partiality, dogmatism, and vituperation, can be called the product of imagination. These works, however, have been read, believed, and received as science by great numbers; and, in fact, are not, yet, without a considerable hold on the minds of many superior and enlightened people. This may account for the antipathy which studious ethnologists have to any speculation beyond a rigid induction from ascertained facts. But although some theorists are shallow, prejudiced, strongly whimsical, and weakly imaginative, it does not follow that all are so. On the contrary, an able theory, propounded by a man of clear intellect and vivid imagination, is sure to be eminently suggestive; and, in this respect, cannot but be highly useful to the ardent and assiduous observer. Such a theory supplies the practical ethnologist with important hints calculated to be of great service to him in his endeavours to unravel many of the intricacies which observation presents to him.

It may give him light on many obscure points, and help him to see his way clearly where he saw but dimly before. If he does not adopt the theory entirely, it may lead him, and, also, aid him, to form a theory of his own, more perhaps, in accordance with the result of his inquiries and observations. Again, it may fire his flagging enthusiasm, stimulate him to further exertion; and, although there is no royal road to ethnology any more than to geometry, it may smooth the rugged path a little, soothe and refresh the weary traveller, and so 'send him on his way rejoicing.'

A good theoretical book, therefore, on a department of science that is but imperfectly known, is by no means to be disapproved of; but, rather, to be hailed as highly serviceable to the prosecution of inquiry. On this account, it is exceedingly pleasing to fall in with a work of this class,—a work written in a charming style, brimful of poetic allusions, and largely abounding in important and instructive suggestions. The work is entitled "*Ethnology and Phrenology.*" The author is Mr. J. W. Jackson, a writer well known already to the scientific world by his able articles in the "*Future*," as well as by several interesting and important works on scientific subjects. Mr. Jackson is one of those who impart a peculiar fascination to whatever they write, and the present work has all the power of exciting curiosity and enchaining attention, which well written novels possess. When

the book is taken up it can hardly be laid aside till the whole is read through, and when read through the charm is by no means dissolved. Such a train of delightful meditation has been aroused in the mind; such a wide *coup d'œil* has been presented to it; such emotions have been awakened, that the reader feels a kind of regret in laying the book aside; nay, feels inclined to re-read it, and, in doing so, experiences more pleasure, and finds that the intellectual delights of the work are by no means exhausted. The truth is, it may be read over several times with increased pleasure and benefit.

Phrenology, as a scientific theory, has, for a long time, been before the world, and it may be said, with certainty, that no philosophical theory has ever been more severely tested. It has all along met with most stringent opposition, and its advocates may be said to have fairly answered, in a reasonable manner, most of the objections made to it. The fundamental principles of the science may, therefore, be said to be fairly established; although it is but yet in its infancy. It would, consequently, be extremely injudicious in the ethnologist to deny himself any aid which he might derive from it; in fact, were he to do so he would be denying himself the use of one of the most powerful instruments for throwing light on the most obscure portions of the science. Mr. Jackson has, accordingly, employed phrenology to great advantage in his interesting work, and, by its valuable aid, has given very clear and rational explanations of intricate and profound ethnological questions. The book is remarkable for a wonderful power of concentration; of very few books can *multum in parvo* be more truly predicated. The arrangement is beautifully methodical, and all the nations of past and modern times are presented to our view with such vividness as would do credit to the pencil of an artist.

Here we have a fine ethnological portraiture of Caucasian, Mongol, and Negro; of Copt, Jew, Egyptian, and Syrian; of Greek, Roman, Celt, Teuton, and Slavonian. The characteristics of these, both physical and mental, are nicely discriminated and delineated; their respective missions are suggested; and their ethnic relations to one another are pointed out. Although such terms as Caucasian, Negro, and Mongol, are now being disputed, and in a manner thrown aside, from its being shown that they do not truly designate single races; still the terms apply very well to groups of races that are more closely allied to one another; and, on this account, Mr. Jackson is fully justified in having adhered to them. The Negro is, doubtless, a distinct race from the Caffre, the Chinese from the Fin, and the Celt

from the Teuton; but the Caffre is, certainly, nearer the Negro than he is to the Chinese or Celt. Indeed, our present recognised races may yet be found out to be groups of very closely allied ones, as nebulae are discovered to be clusters of stars by Lord Rosse's telescope.

Mr. Jackson is in favour of the theory that places man in a natural kingdom of his own, and there is very great reason to think that his intellectual and moral nature point him out as an order of being fully distinct from the animal creation. On this point Mr. Jackson (p. 15), remarks;—"In all the earlier works on natural history, man was simply regarded as the *genus homo*, and, in fact, was generally described as a distinct species. This error, for such it undoubtedly was, arose from an overweening estimate of the importance of the ruder portions of the corporeal structure, to the neglect of the nervous system and its higher product, as manifested in mental capacity. Resemblances and diversities in the locomotive, respiratory, and alimentary functions were forcibly dwelt upon, while the immense difference phrenologically observable in the cerebral was practically ignored. This was, perhaps, almost unavoidable previous to the discoveries of Gall; and was, moreover, in strict accordance with the grossly materialistic spirit of the eighteenth century, which loved to dethrone the superior and enthrone the inferior. Gradually, however, have these mistakes in arrangement been corrected. Cuvier placed man in a distinct order—the Bimana; and, as we have said, Professor Owen accords him his rightful supremacy in the Archencephala, on the strength of his cerebral development alone—a most important movement in the right direction. But we may still ask, is this sufficient? Does man differ from the ape and the lion only as the latter differ from the sloth and the bat? We may go still further, and ask, does he differ from the quadrumanous and quadrupedal mammalia only as the latter differ from the reptilia? Is it sufficient to make him simply a distinct class? If we regard only his anatomical proclivities of structure, as at present taught authoritatively in the schools, we shall, of course, say yes. But if we contemplate him morally and phrenologically, we shall answer no. The difference is greater than can be signified by mere diversity of class. When we see the entire animal kingdom living on the plane of unassisted nature unclothed and, save in a few exceptional instances, unhoused, both herbivora and carnivora taking their food quite unprepared; when we see them the creatures of instinct and impulse, utterly devoid of moral sentiment, and, consequently, of conscious responsibility, altogether incapable of rising to the level of abstract thought, and, therefore, on

the plane of simple fact and limited personal experience, ignorant of first principles, and wholly deficient in imagination, in very truth, merely organic and sentient machines; when we compare such beings with man, who has subdued the earth to his purposes; who has covered the land with his cities, and bridged the sea with his ships; who lives under an abiding sense of moral responsibility, and in the resplendent hope of an endless immortality; who ascends as by a law of his higher nature from fact to principle, and has thus grandly interpreted the sublimer verities of that universe amidst which he is physically so insignificant a dweller, and who, despite his magnificent realizations in the religious, social, literary, and artistic spheres, has, nevertheless, an ideal of unattainable excellence within, at once the guide and the prophecy of never ending progress hereafter, both individually and collectively; when we compare these two radically distinct, and we might say contrasted, orders of being, it becomes at once obvious that we must separate man from the inferior creatures by something wider than the demarcation of a class, we must boldly advance to the grander lines of a kingdom, and fearlessly assert that man is separated from the animals, as they from the vegetables, and the latter from the minerals. This is at present rank scientific heterodoxy. We know it, and are quite contented to wait till it becomes respectable scientific orthodoxy."

Here we have the grand distinctive characteristics of man pointed out with trenchant discrimination, and with graphic vividness of delineation. However difficult it may be to discover in man's anatomical structure the gulf between himself and the animal creation, there are very strong probabilities in favour of the opinion that this discovery is but a question of time; that further inquiries will discover something in the human structure separating him as fully from the animal creation as his mental nature does. Mr. Jackson points to phrenology as a theory fully capable of accounting for the difference; and the reader of this able and interesting book will find his views, on this important question, beautifully illustrated in the comparison of man with the gorilla.

The confounding of races, nations, and peoples, has greatly retarded the progress of ethnology, darkened the path of the science, and obstructed it with innumerable errors. It is very much to be regretted that the names of nations and peoples have been adopted for those of races which formed principal elements in them. On this topic Mr. Jackson makes the following judicious observations:—

"Do we yet really know what is meant by a race or a nation; or

have we settled in what sense the word unity is to be used? Politically speaking, a nation is one thing—ethnically, it is another; and we are almost unavoidably prone to the vicious habit of confounding the two, without due regard to their radical distinction. It is the same with languages, which are by no means identical, in the sphere over which they prevail, with that of the race amidst whom they may have originated, and of whom alone, therefore, they can be profoundly characteristic. Philology is no doubt a most serviceable handmaid to Ethnology, but to be so must be kept in due subordination.”

We err when we talk of Irish and Scottish highlanders as Celts, in contradistinction to English and Scottish lowlanders. There are portions of the Scottish highlands much more Teutonic than some portions of the lowlands; several of the Hebrides, and a large part of the north-east and east of Ireland are more Teutonic than the west and south-west of England. The Scottish highlanders are an example of a people speaking a Celtic language, who have the same national sympathies, and very much of the same national character, with the Scottish lowlanders, who speak a Teutonic one. Though speaking a kindred language with the English, these cannot be called the same people, any more than they can be called the same nation; since they have widely different traditions and superstitions, and a widely different popular poetry, which breathes antipathy, and strong national animosity to their kindred neighbouring people. The Scottish highlanders may be called the same people with the Gaelic speaking Irish, as both speak the same language, though differing somewhat in dialect, and have a common stock of tales, traditions, and superstitions. Both have the same common ancient poetry, about which Scotland and Ireland have waged such a furious pen-war; each country claiming those ancient ballads as its own exclusive property. The highlander is united to the Irishman by language and traditions; to the lowlander by political institutions and historical associations. When a considerable portion of mankind speak the same language, and have common traditions, they may be considered the same people; when for a long period governed by the same institutions, they form one nation, but they may be composed of several distinct races. There is a distinct character belonging respectively to race, nation, and people. The English have a common national character, which is very conspicuous; but the racial character of the Cornishman differs widely from that of the people of Suffolk and Norfolk. In the former, Celtic peculiarities predominate; in the latter, Teutonic ones. The following passage from that entertaining

and instructive book, *Seaside Studies*, by George Henry Lewes, will throw some light upon this point:—

“The Scillians are a remarkably healthy, good-looking race; the black eyes and long eyelashes of the children making one’s parental fibres tingle with mysterious pleasure, as the ruddy rascals pause in their sport to look at the stranger. Their manners are gentle and dignified; civil, not servile. Not an approach to rudeness or coarseness have I seen anywhere.”

This clear and vivid description of the Scilly islanders would equally apply to the highland inhabitants of Uist and Barra; and any one who has studied the features and manners of the peasantry of the east of England, knows it does not apply to *them*.

In his *Universal History*, Voltaire remarks that there are but three agents by which civilization is advanced; religion, commerce, and conquest. How the latter effects this purpose is beautifully explained by Mr. Jackson, in the following passage, by the theory of race:—

“Superior races must colonize inferior to give them nerve; and inferior races must occasionally conquer superior, to restore them the bone and muscle, the strength and stature wasted amidst the wearing excitement of a previous era of civilization and progress. The Gothic invasion of the decadent Roman empire was simply an ethnic phenomenon in strictest accordance with the principles here enunciated.”

So the destruction of an effete civilization by robust and vigorous barbarians, is but a preparatory process for the attainment of one still greater and higher.

Mr. Jackson is somewhat inclined to doubt the metaphysical superiority of the Germans, of whom he speaks in the following terms:—

“Perhaps our estimate of German ability in metaphysics is rather exaggerated. We have overrated them, and underrated ourselves. Kant was started by Hume, as the latter was but Locke in his ultimates; while even the last very orthodox philosopher was only a Christianized edition of Hobbes adapted for general circulation.”

The doubt thrown out here modestly, may be pronounced a certainty. German metaphysicians are overrated, and very much so, because they make a great noise about the matter themselves. The Celts are as metaphysical, if not more so, than the Germans; but, from their peculiar temperament, they are more desirous of being admired for other literary and scientific abilities. It is very remarkable that neither the French nor the Irish make any noise about their metaphysicians; yet, in this respect, they are not to be rivalled by any other nation. Descartes is at the head of modern philosophy; Malebranche and Pascal were among the most spiritual of thinkers. Berkeley’s acumen is hardly yet properly appreciated, and was totally

misunderstood by those who pretended to refute him. In the middle ages, the Irish students attending the universities in Spain, and other countries on the continent, were alike celebrated for their physical and metaphysical combative powers. Hume belonged to Fifeshire, a district in which "the names of places are without exception Celtic", and which was never conquered by the early Anglo-Saxons. "In Kirkaldy," says Dr. Beddoe, "I think the peculiarly Scotch features rather prevalent." This was the native town of the most distinguished of Scottish metaphysicians.

Scandinavia and Holland have hardly produced any metaphysicians. The German metaphysical talent seems to belong to the Central and Southern Germans; and it is remarkable that the Catti, who may be considered the true ancestors of the modern Germans, are pointed out by Tacitus from the rest for their forethought and reflection: "*Multum (ut inter Germanos) rationis ac solertiæ*"; while of the Chanci, the true Saxon, the modern Westphalian, who extends into Holland and Eastern Britain, he says: "*Populus inter Germanos nobilissimus quisque magnitudinem malit justitia tueri: sine cupiditate, sine impotentia.*" Thus Tacitus distinguishes three Teutonic races, who probably owed their common language, manners, and physical resemblance to Scandinavian conquest which took place previous to the time that the Cimbrians poured down in such formidable hordes upon Italy and Gaul. The democratic principle is preeminently Saxon. It was the Saxon mind that created the Hanse Towns, and that established the republic of Holland. The Scandinavian, though haughty in character, is strongly disposed to monarchy and aristocracy; the feudal monarchies of the middle ages were of Celto-Scandinavian origin. These were in time properly checked and modified by the rise of the Saxon in towns and burghs. A love of the grand and the sublime, a strong imagination, and a very strong inductive faculty, with but moderate deductive power, particularly distinguish the Scandinavian. In perceptive power he far rivals the other Teutonic races, while in that faculty called locality by phrenologists no other race equals him; hence his preeminence as a seaman, and his travelling propensities. The English and American mania for travelling is of Scandinavian origin. As an infantry soldier he is not to be surpassed, any more than as a seaman; but, when mixed with the Celt, he is the perfection of humanity both on sea and land. One of his greatest faults is egotism, combined with bombastic magniloquence. The writer of these lines walked into Exeter Hall, when on an excursion to see the Great Exhibition in 1851, for the purpose of hearing

some of the "humanitarian" speeches delivered there, and observed a gentleman of florid complexion and light sand coloured hair—in fact, of pure Scandinavian type—rising to deliver a speech on the evils of "law's delay" in chancery. The commencement of the speech was characteristic of the race:—"We, the most civilized people in the world." A few years ago, the American president complimented his countrymen as a "nation of sovereigns."

The Scandinavian mind is properly represented by Tycho Brahe, Linnæus, Swedenborg, and Thorwaldsen. Malte Brün, the prince of geographers, is also of this race; but they have no metaphysicians worthy of the name. As an astronomical observer, Tycho Brahe never had an equal; but, in endeavouring to give a theory of the universe, he totally failed. The Scandinavian mind is strongly marked in Newton, Milton, Byron, Scott, and Campbell. It is strongly perceptible in the eloquence of Burke and Chalmers. Never, by ancient or modern, was sea-life and sea-heroism described with such vigour, clearness, enthusiasm, and elevation, as by Campbell, Byron, and Scott. The *Corsair* is but an ancient Viking in an eastern dress.

These, then, are the several Teutonic races, all distinguished by peculiar prominent qualities, by whom the British Celts have been crossed, through conquest at various successive periods, so as in process of time to produce the present British or Anglo-Saxon race, which Mr. Jackson pronounces "a thoroughly baptized Celt", and which race he very clearly and correctly describes in the ensuing graphic terms:—

"The Anglo-Saxon seems to have inherited the strength without the weakness of those from whom he descends. In him the activity and impulsiveness of the Celt are so controlled by Teutonic self-command, as to eventuate only in sustained and well-directed energy; while Roman decision and firmness of purpose are united with an expansion of intellect and versatility of faculty, to which the specially endowed *dominos rerum* never approached. He has the massiveness of the Goth without his phlegm, and the enterprize of the Norseman without his ferocity. And what is somewhat remarkable, although now subjected during several centuries to what are usually considered the exhausting influences of civilization, he has preserved the robust qualities of his variously gifted predecessors, more effectually than their immediate and comparatively unmingled descendants in the older countries whence they emigrated into Britain."

We forbear to quote further from a book which every person, interested in the science of Man, should read. One pleasing trait of the author is his hopefulness. He entertains brilliant anticipations

of the future destiny of mankind; and, with prophetic scientific penetration into the future, points out the great, important, and beneficial results to which the proper interfusion of races tends. He sees the necessity of inferior races being ruled by superior ones, and looks out for a high civilization, even for the Negro in Africa, when he shall be mixed with races not too widely different from him in organization.

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### LYELL ON THE GEOLOGICAL EVIDENCE OF THE ANTIQUITY OF MAN.\*

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It has been long known that Sir Charles Lyell was engaged on a work treating of the antiquity of man. ✓The name of Lyell has been deservedly held in great respect by geologists, and by the public at large, for the last thirty years. It was admitted on all sides that Sir Charles Lyell was the right man to undertake such a work. It was, besides, generally felt that a name which commanded influence with the public at large, ought to be put to the work which should collect and arrange the mass of facts that have gradually accumulated on this subject. In many quarters great expectations were roused that this work would be something original; but those who were acquainted with the literature on this subject knew that there was little more to be done than to give a fair summary of known facts. To find little original or new must be a great disappointment to very many. How far has the author succeeded in giving us, then, a fair compilation? In the first place, we must say that it is exceedingly creditable to Sir C. Lyell, that having written against the antiquity of man in his *Principles of Geology*, and having devoted a special chapter to the recent origin of man, that he should live to show the fallacy of his reasoning from 1832 to 1858. Sir C. Lyell is well acquainted with the art of compilation; but his present work is not equal to his former productions. Indeed, much of this work is not calculated to add to the reputation of the author; but the extreme caution which characterizes nearly every sentence will make it admired by all "sound geologists." The work in its totality is something frightful. Sir Charles is not content with giving the facts relating to the antiquity

\* *The Geological Evidences on the Antiquity of Man, with Remarks on Theories of the Origin of Species and Variation.* By Sir Charles Lyell, F.R.S. Murray, 1863.

of man, but he has obtruded questions which have nothing to do with that subject. We think the plan of announcing a work on the *Geological Evidences of the Antiquity of Man*, and then introducing long chapters on the theories of the origin of species, to be most objectionable. But we have other complaints to make against this work, which we shall briefly touch on as we proceed. In making these objections, we would wish to state, *in limine*, that we entertain the highest respect for the author, and freely acknowledge that he has done good service to the cause of truth and science by the publication of his present work. We cordially sympathize with the spirit of the undertaking, and freely acknowledge that the author has made a very fair epitome of existing facts, and that his work, although studiously laboured, is still very readable. We are grateful for what the author has given us, but regret that it is not so complete and satisfactory as we believe it was in the power of Sir Charles to make it.

The work begins with a chapter on the Danish peat mounds and Swiss lake dwellings. We had thought that both these subjects should come under the exposition of the archæologist rather than the geologist. However this may be we are bound to confess that this chapter is far from being even a complete epitome on these subjects. Indeed, it is clear that Sir Charles is not at all at home in writing of archæological subjects. Many of the most important facts are entirely omitted, and there is a want of clearness of exposition which sufficiently shews that the author is not thoroughly versed in his subject. When the author understands his subject, he invariably writes clearly; and there are not a few passages in the work which deserve to be commended, both from the clearness with which they are narrated, as well as from the value of the facts themselves. In the account of the lake-habitations of Switzerland, we read:—

“Carbonized apples and pears of small size, such as still grow in the Swiss forests, stones of the wild plum, seeds of the raspberry and blackberry, and beech nuts, also occur in the mud, and hazel nuts in great plenty. Near Morges, on the Lake of Geneva, a settlement of the bronze period, no less than forty hatchets of that metal have been dredged up; and in many other localities the number and variety of weapons and utensils discovered, in a fine state of preservation, is truly astonishing. It is remarkable that as yet all the settlements of the bronze period are confined to Western and Central Switzerland. In the more eastern lakes, those of the stone period alone have as yet been discovered. The tools, ornaments, and pottery of the bronze period in Switzerland bear a close resemblance to those of corresponding age in Denmark, attesting the wide spread of a uniform civilization over Central Europe at that era. In some few of the aquatic

stations, as well as in tumuli and battle-fields in Switzerland, a mixture of bronze and iron implements and works of art have been observed, including coins and medals of bronze and silver, struck at Marseilles, and of Greek manufacture, belonging to the first and pre-roman division of the age of iron. In the settlements of the bronze era, the wooden piles are not so much decayed as are those of the stone period; the latter having wasted down quite to the level of the mud, whereas the piles of the bronze age (as in the Lake of Brienne, for example) still project above it. Professor Rüttimeyer of Basle, well known to palæontologists as the author of several important memoirs on fossil vertebrata, has recently published a scientific description of great interest of the animal remains dredged up at various stations, where they had been imbedded for ages in the mud in which the piles were driven. These bones bear the same relation to the primitive inhabitants of Switzerland and some of their immediate successors, as do the contents of the Danish 'refuse-heaps' to the ancient fishing and hunting tribes who lived on the shores of the Baltic."

We next have an account of the investigations of Mr. Leonard Horner respecting the age of pottery found in the Nile sediments. We are sorry to find that Sir Charles Lyell has thought it worth while to notice such absurdities. Because some burnt brick was found sixty feet deep, therefore it must be twelve thousand years old! At least Hekekyan Bey, an Armenian, vouches for the pottery being found at that depth, and no doubt correctly. To waste the money of the Royal Society, and to occupy the paper and print of the *Philosophical Transactions*, was bad enough, but to base a chronology on the evidence Mr. Horner adduced was preposterous. Well may Sir Charles Lyell observe :

"The experiments instituted by Mr. Horner, in the hope of obtaining an accurate chronometric scale for testing the age of a given thickness of Nile sediment, are not considered by eminent Egyptologists to have been satisfactory. The point sought to be determined was the exact amount of Nile mud which had accumulated in three thousand or more years, since the time when certain ancient monuments, such as the obelisk at Heliopolis, or the statue of King Rameses at Memphis, are supposed by some antiquaries to have been erected. Could we have obtained possession of such a measure, the rate of deposition might be judged of, approximately at least, whenever similar mud was observed in other places, or below the foundations of those same monuments. But the ancient Egyptians are known to have been in the habit of enclosing with embankments the areas on which they erected temples, statues, and obelisks, so as to exclude the waters of the Nile; and the point of time to be ascertained, in every case where we find a monument buried to a certain depth in mud, as at Memphis and Heliopolis, is the era when the city fell into such decay that the ancient embankments were neglected, and the river allowed to inundate the site of the temple, obe-

lisk, or status. Even if we knew the date of the abandonment of such embankments, the enclosed areas would not afford a favourable opportunity for ascertaining the average rate of deposit on the alluvial plain; for Herodotus tells us that in his time those spots from which the Nile waters had been shut out for centuries appeared sunk, and could be looked down into from the surrounding grounds, which had been raised by the gradual accumulation over them of sediment annually thrown down. If the waters at length should break into such depressions, they must at first carry with them into the enclosure much mud washed from the steep surrounding banks, so that a greater quantity would be deposited in a few years than, perhaps, in as many centuries on the great plain outside the depressed area where no such disturbing causes intervened."

Speaking of the Mound builders of America, the author writes :

"It is clear that the Ohio mound builders had commercial intercourse with the natives of distant regions, for among the buried articles some are made of native copper from Lake Superior, and there are also found mica from the Alleghanies, sea shells from the Gulf of Mexico, and obsidian from the Mexican mountains. The extraordinary number of the mounds implies a long period, during which a settled agricultural population had made considerable progress in civilization, so as to require large temples for their religious rites, and extensive fortifications to protect them from their enemies. The mounds were almost all confined to fertile valleys or alluvial plains, and some at least are so ancient, that rivers have had time since their construction to encroach on the lower terraces which support them, and again to recede for the distance of nearly a mile, after having undermined and destroyed a part of the works."

There is an account of the Mounds of Santos in Brazil, the Delta of the Mississippi, and the Coral Reefs of Florida, which are all dismissed with three pages out of the 506 which the work contains. We then have ten pages on Recent Deposits of Seas and Lakes : and then Sir Charles begins to get at home, and writes on the upheaval since the human period of the central district of Scotland, of Cornwall, and Sweden and Norway. We next have an account of the bones of Man and extinct Mammalia in the Cavern of Bize, Engis, and Neanderthal. Professor Huxley then occupies eight pages with observations on the Human Skulls of Engis and Neanderthal. We then come to an account of the Post-pliocene Alluvium containing flint implements in the valley of the Somme. And here we think the author has hardly done justice to the accomplished M. Boucher de Perthes, who first discovered these implements, upwards of twenty years ago (in 1841), and who published a full and correct account of his discoveries sixteen years ago (in 1847). Sir Charles Lyell does not explain why he did not examine this evidence until more than ten years after the

publication of M. Boucher de Perthes' work. On this subject we should have been glad if Sir C. Lyell had been a little more explicit. All we read is "the scientific world had no faith in the statements that works of art, however rude, had been met with in undisturbed beds of such antiquity."

Now this explanation has been given before; but we think it to be a very lame excuse, and most unjust to M. Boucher de Perthes. It is not our business to discover what were the reasons for the non-acceptance of the conclusions which were given in this work; but they would not be difficult to guess. We say at once, that it is no little disgrace to the geologists of this country that they should have taken no notice of these discoveries until they had been proclaimed throughout the length and breadth of the then United States of America, and had been accepted by some of the best scientific men of that country.

Dr. William Usher of Mobile published in 1854 a most complete summary of all the facts relating to caverns, and also a full account, with illustrations, of M. Boucher de Perthes' discoveries, in the great national American work *The Types of Mankind*. Sir C. Lyell has not mentioned this paper: but the public are likely to learn far more from a perusal of it than from his own studied reserve.

In treating of the Brixham cave, we think that justice is hardly done to the care and labour which Mr. Pengelly and Dr. Falconer devoted to the excavations which were made here. The conclusion is thus given:—

"Upon the whole, the same conclusion which Dr. Schmerling came to, respecting the filling up of the caverns near Liège, seems applicable to the caves of Brixham."

For an exemplification of the working of the peculiar process of reasoning by which Sir Charles Lyell was able to examine the caves near Liège, as well as other caves, and then for thirty years write against their affording any evidence of Man's antiquity, and is now able to say that Dr. Schmerling gave the true reason forty years ago, we must refer to the works of the author.

We next have four chapters on the Post-pliocene Alluvium of France and England, with an account of the works of art that have been found in different caves in Europe. These chapters, although very diffuse, are still written with very great care, and are a good epitome of what is known on the subject. We then come to a chapter in which the human fossil found at Natchez on the Mississippi is discussed. Here we are glad to see that Sir Charles has given up his old style of argument respecting this fossil. Dr. Usher, ten years

ago, protested against the way in which the Natchez fossil was treated. We feel it just to quote an extract from his article.\*

“One human pelvis, found near Natchez by Dr. Dickeson, is an undoubted fossil; yet we are told that ferruginous oxides act upon an os innominatum differently than upon bones of extinct genera lying in the same stratum, lest natural incidents might give to man in the valley of the Mississippi an antiquity altogether incompatible with received ideas: and Sir Charles Lyell accordingly suggests a speedy solution of the difficulty, by saying that a fossilized *pelvis* may have fallen from an old Indian grave near the summit of the cliff. Attempts have been made to throw doubt upon every discovery of human fossils in the same manner: and the greatest ingenuity is exhibited in adapting adequate solutions to the ever-varying dilemmas. In the case of the fossils brought from Brazil, a human skull was taken out of a sandstone rock now overgrown with lofty trees, Sir Charles Lyell had again recourse to his favourite Indian burying-ground; although this time it had to be sunk beneath the level of the sea, and become again upheaved to its present position. But, supposing all this to be true, what an antiquity must we assign to this Indian skull, when we remember the ancient trees above its grave, and reflect upon the fact that bones of numerous fossil quadrupeds, and, among others, of a horse (both found in the alluvial formation), must be of a more recent origin than the human remains.”

On this subject Sir Charles now writes:—

“If I was right in calculating that the present delta of the Mississippi has required, as a minimum of time, more than 100,000 years for its growth, it would follow, if the claims of the Natchez man to have coexisted with the mastodon are admitted, that North America was peopled more than a thousand centuries ago by the human race. But, even were that true, we could not presume, reasoning from ascertained geological data, that the Natchez bone was anterior in date to the antique flint hatchets of St. Acheul.” \* \* \* \* \*  
“Should future researches, therefore, confirm the opinion that the Natchez man coexisted with the mastodon, it would not enhance the value of the geological evidence in favour of man’s antiquity, but merely render the delta of the Mississippi available as a chronometer, by which the lapse of post-pliocene time could be measured somewhat less vaguely than by any means of measuring which have as yet been discovered or rendered available in Europe.”

Seven chapters follow, in which the following subjects are treated—Antiquity of Man relatively to the Glacial Period, and to the existing flora and fauna; Chronological Relations of the Glacial Period, and the earliest signs of man’s appearance in Europe (two chapters); Extinct Glaciers of the Alps, and their chronological relation to the Human Period; Human Remains in the Loess, and their probable

\* “Geology and Paleontology in connection with the Human Origins.” *Types of Mankind*, page 344. 1854.

age; Post-glacial Dislocations and Foldings of Cretaceous and Drift Strata in the Island of Møen in Denmark; The Glacial Period in North America.

From these chapters we only make one extract; but we cannot help remarking that it was hardly necessary to have extended the subject of these chapters as the author has done. The following extract, we trust, is sound geology:—

“ I cannot doubt that these large erratics of Upsala were brought into their present position during the recent period, not only because of their moderate elevation above the sea level, in a country where the land is now rising every century, but because I observed signs of a great oscillation of level which had taken place at Södertelje, south of Stockholm, (about forty-five miles distant from Upsala), after the country had been inhabited by man. I described, in the *Philosophical Transactions* for 1835, the section there laid open in digging a level in 1819, which showed that a subsidence followed by a re-elevation of land each movement, amounting to more than sixty feet, had occurred since the time when a rude hut had been built on the ancient shore. The wooden frame of the hut, with a ring of hearthstones on the floor, and much charcoal were found, and over them marine strata, more than sixty feet thick, containing the dwarf variety of *Mytilus edulis*, and other brackish-water shells of the Bothnian Gulf. Some vessels put together with wooden pegs, of anterior date to the use of metals, were also embedded in parts of the same marine formation, which has since been raised, so that the upper beds are more than sixty feet above the sea-level, the hut being thus restored to about its original position relatively to the sea.”

Chapter the nineteenth is a recapitulation of “ the geological proofs of Man's Antiquity.”

“ The opinion entertained, generally, by classical writers of Greece and Rome, that man in the first stage of his existence was but just removed from the brutes, is faithfully expressed by Horace in his celebrated lines, which begin :

‘ *Quum prorepserunt primis animalia terris.*’—Sat. lib. i, 309.

The picture of transmutation given in these verses, however severe and contemptuous the strictures lavishly bestowed on it by Christian commentators, accord singularly with the train of thought which the modern doctrine of progressive development has encouraged. ‘ When animals,’ he says, ‘ first crept forth from the newly formed earth, a dumb and filthy herd, they fought for acorns and lurking places with their nails and fists, then with clubs, and at last with arms, which, taught by experience, they had forged. They then invented names for things, and words to express their thoughts, after which they began to desist from war, to fortify cities, and enact laws.’ They who in later times have embraced a similar theory, have been led to it by no deference to the opinions of their Pagan predecessors, but rather in spite of very strong prepossessions in favour of an opposite hypo-

thesis, namely, that of the superiority of their original progenitors, of whom they believe themselves to be the corrupt and degenerate descendants. So far as they are guided by paleontology, they arrive at this result by an independent course of reasoning; but they have been conducted partly to the same goal as the ancients, by ethnological considerations common to both, or by reflecting in what darkness the infancy of every nation is enveloped, and that true history and chronology are the creation, as it were, of yesterday."

Sir Charles Lyell must simply speak for himself when he talks of the "corrupt and degenerate descendants." The whole of this part of the extract is far from clear. This chapter ends with a reference to the late Sir G. C. Lewis's *Astronomy of the Ancient and Early Egyptian Dates*.

So far the work on the "Geological Evidence of the Antiquity of Man" is completed; the remainder of the book treats on theories of progression and development. That subject has nothing to do with the antiquity of man. It is true, however, that no theory of development can be true without an enormous antiquity; but any amount of antiquity for the appearance of man or his works does not give any support to the theory of progressive transmutation. In taking leave of this work we feel bound to confess that Sir Charles has done his best to write a work which should be for the advancement of truth and the benefit of science. The time, however, has not yet arrived when an exhaustive treatise, like Sir Charles Lyell's attempt, could be written. If Sir C. Lyell would compile a small work purely on the geological evidence of the antiquity of man, he would be really doing good service, as such a work is now much needed. The present work is indispensable to the geologist, but it is far too diffuse for the public generally. The book, as it stands, would be greatly improved if the archæological evidence were omitted, such as the ancient account of the lake habitations and mounds, and especially the chapters on the development theories. Sir Charles writes as though it were only within the last few years that we had any reason to believe in a great antiquity for man. Anthropologists, however, have long been convinced that the recent origin of man rested simply on negative evidence, and they always anticipated that time and researches would bring to light the remains of man with the extinct mammalia. All the conditions of man's existence were then in operation, and every branch of Anthropology indicated a very considerable antiquity for man's first appearance; and the following extract from Steffen's *Anthropologie*, published more than forty years ago, will show what was held by Anthropologists at that period, and we believe by nearly all the leading writers, not excepting Dr. Prichard, since that time.

“The question arises, has this vast catastrophe occurred before or after the creation of man? According to the opinion of our naturalists the inquiry is perfectly useless. They are all convinced that the revolution which destroyed the monstrous animals took place before man’s advent, and they support their opinions by the circumstance that no anthropoliths (petrifications of man), are to be found. Recent discoveries have raised great doubts on this subject. There is one circumstance which must not be overlooked. Animals are more fettered by certain conditions, especially limited as they are to certain kinds of food. A beast of prey, though driven by hunger, cannot live on plants, nor will an elephant consume animal food. The sudden change of external conditions rendered the extinction of these animals imperative. Not so with man. Just as at present, he can live in every climate, and feed on animals or plants, so could he then. He had also the power of saving himself from destruction by ascending the hills. We must, therefore, not wonder if human bones are very rare. I take it to be a fact that the human race existed before the great catastrophe which destroyed a gigantic vegetation and monstrous mammals.”

In conclusion, we have only again to express our high sense of the value of Sir Charles Lyell’s book, and our pleasure that it has already reached a second edition.

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#### WILSON’S PRE-HISTORIC MAN.\*

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Dr. WILSON is known by his *Pre-Historic Annals of Scotland*, published some years ago. He was a practised archæologist, familiar with the antiquities of Great Britain, before he accepted a professorship in University College, Toronto. A full acquaintance with a well-worked field in the Old World was, of course, a most useful introduction to the study of American Ethnology, and his previous experience gives him the power, often wanting among American antiquaries, of explaining and classing facts by reference to the archæology of other regions.

It is, however, most unfortunate that Dr. Wilson should have undertaken in his present work a task more fitted for the crowning labour of such a life as Humboldt’s, than for the occupation of the leisure hours of an antiquary, whose solid basis of knowledge consists only in a familiarity with the archæology of Great Britain, and of that

\* *Pre-Historic Man; Researches into the Origin of Civilization in the Old and the New World.* By Daniel Wilson, LL.D., Cambridge. London: Macmillan, 1862.

part of North America which lies above the tropics. As to Mexico, Central America, and South America, he mostly compiles from well-known authors, and though his observations are often highly amusing and instructive, they are not what so important a subject demands, the well-digested opinions of a student thoroughly acquainted with all that has been already done by workers in the same field.

The first volume contains (chapter viii) the best description we have met with of the ancient workings of the native copper veins of Lake Superior, drawn from personal investigation as well as books. Dr. Wilson demolishes the notion, so often entertained in America, that the old copper-workers had some other means of hardening tools of native copper than hammering them, and describes well the simple processes they must have employed by cracking the rock by fire, and getting the copper clear by beating with stone hammers. It is to be observed that he believes the greater copper-workings to have been done, not by the present race of Indians, but probably by the extinct race known as the Mound-Builders, who have left remains so remarkable for size, symmetry, and number, in the valleys of the Mississippi and its tributaries. These mound-builders Dr. Wilson discusses at length, drawing his information, of course, for the most part, from Squier and Davis, in vol. i of the *Smithsonian Contributions*, and attacking energetically the theory supported by some American antiquaries, as, for example, Schoolcraft, who thus sums up his opinion on this subject at the end of his great work: "The mound-builders were the ancestors of the existing Indian race. The theory of there having been prior races of superior civilization and arts, has no countenance from examinations made in his work" (Part 111, p. 393). Dr. Wilson's view is exactly contrary to this, and we think the best of the argument is on his side. He dwells upon the importance of their earthworks used for defence and worship, so different from their mean representatives among the modern Indians; the accuracy of their squares and circles in works many acres in area; the curious correspondence of their dimensions in different parts of the country, which makes it likely, though not certain, that they had a unit of measurement; their remarkable sacrificial system; the extraordinary excellence of their characteristic pipe sculpture, etc.

When Dr. Wilson quits the beaten track of Squier and Davis, and strikes into a new path of his own, he gets, in one instance at least, upon what seems to us very unsafe ground. Certain copper bracelets occur in a mound, which Squier and Davis describe (p. 204-5) as "of uniform size and weight," and which "weigh four ounces each,"

and Dr. Wilson says that they "when perfect weigh exactly four ounces each. This becomes a proof to his mind that the mound-builders knew the art of weighing, which even the Aztecs did not possess. At least in vol. ii, p. 453, he sets down, on the strength of this, "standard weights," as known to the inhabitants of North America. The assumption seems to us to rest on no sure foundation, at least so far as Dr. Wilson gives the data. The bracelets appear to have belonged to one person, so that there is nothing very surprising in their being pretty nearly alike; but Dr. Wilson does not give the weight in grains, and the even quantity, four ounces, shows how rough the observation is. He may have formed his opinion upon more accurate evidence than this, but, if so, this evidence should have been given.

We find Dr. Wilson repeating the usual statement in describing the evidences of commerce with distant parts found in the mound-builders' tumuli; "objects formed from the mica of the Alleghanies, and the native copper of Lake Superior, mingling with others made of the obsidian of Mexico, or modelled from tropical fauna of the southern continent" (vol. i, p. 223). The latter important point is treated at p. 476, etc., but we think does not rest on sufficient evidence; and the same objection holds as to the "obsidian of Mexico," which might be supposed to prove intercourse, direct or indirect, between the mound-builders and the Mexicans. But obsidian is not only found but used by the natives for weapons, etc., in other places on the Continent, and why may not this obsidian have come from Northern California or Oregon?

The chapters in this work headed "The American Cranial Type" and "Artificial Cranial Distortion" are verbose, superficial, and unsatisfactory. It is difficult to give any intelligible account of the wilderness of undigested facts which are comprised in the hundred and twenty-five weary pages on the subject. Suffice it to say, that we have carefully examined Dr. Wilson's compilation, and fail to perceive either a single new fact, or a single old one placed in an intelligible and instructive form. Moreover, it is but too evident that the author has not taken care to render himself familiar with the best authorities on the subject. He adopts the careless and inaccurate observations of Mr. J. H. Blake, and gives a figure of a skull (p. 242) which he terms a "well proportioned symmetrical skull, unaltered by any artificial appliances." This skull appears to us merely an example of Forville's *tête annulaire*, and undoubtedly due to circular-constriction behind the coronal suture. The manner in which the

logician's *suggestio falsi* is made use of by Dr. Wilson, to induce general readers to believe that the theory that the American aborigines are referable to two distinct cranial types—the brachy- and dolichocephalic—was arrived at by Mr. J. H. Blake as an original observation, we consider very much to be deplored. The theory was originated by Morton, but was left to be intelligibly propounded by Retzius. The whole subject of the distortion of Peruvian crania has been sufficiently ventilated of late years: and the supererogatory attention which Dr. Wilson has paid to the subject can, we think, only be attributable to an excess of leisure on his part, which is most unprofitably spent in the two chapters before us.

The chapters on the Mixture of Indian and White Blood are of great interest to the anthropologist. Dr. Wilson utterly repudiates the idea of the half-breeds being an example of the weakness and non-permanence of mixed races; and he gives an account of their physical and moral excellences, which the advocates of the opposite view of such races have to answer. It is true that these half-breeds are not likely to form a permanent race; but this arises, in Dr. Wilson's opinion, from no want of productiveness, but simply from their gradual absorption into the general population of the country. We do not go further into the discussion of Dr. Wilson's anthropological opinions, which we hope will be examined by special students.

We have complained of Dr. Wilson's discussing various important topics without a proper knowledge of existing materials. For instance, a dissertation on museums of Mexican antiquities (vol. ii, p. 94, etc.) contains no mention of the great Uhde collection, now at Berlin, the finest in the world except that of Mexico itself. A discussion of the mysterious question, "Who were the builders of the ruined cities of Central America?" ought to have contained at least some reference to the remarkable legends published by the Abbé Brasseur de Bourbourg; and it is of little use to argue at the present day about the origin and history of the Aztecs, without the aid of one of the very most important pieces of evidence we possess on this difficult subject, Professor Buschmann's researches on the traces of the Aztec language far up into the interior of North America.

We find with astonishment, a mention of "Letters" as known to the ancient inhabitants of Central America (vol. ii, p. 453). This must, we suppose, refer to the remarkable figures, often spoken of as "hieroglyphics", in the Central American sculptures. Any one who looks at the description of these sculptures in vol. ii, chap. xix, or studies the plates in Stephens for half an hour, may know as much as

Dr. Wilson or any one else knows about the matter, and will at least wonder at the power of imagination which has enabled him to lay it down that they are "hieroglyphic holophrasms" and "letters"!

Dr. Wilson is very unfortunate in his philology. He adopts the popular derivation of the name of the *manatí*, or cow-fish, from Spanish *mano*, a hand, as though meaning "the fish with hands", without stopping to inquire by what process of Spanish etymology *manatí* could be made from *mano*. The word is really a Carib one, and is given as *manattoüi* in Raymond Breton. He regards the word *kona*, which is said to mean "woman" in Greenlandish as well as in Old Norse, as "a clearly recognized trace" of the presence of the Norsemen in Greenland. Now, though Egede gives the word *kona* in his *Dictionary*, he marks it as not genuine Greenlandish; and, if it were genuine, it would not be safe to say, without further evidence, that it was anything more than an accidental coincidence.

"One swallow does not make a summer", is one of the fundamental principles of philology. Chapter iii of the first volume is on speech; and in it the author's exaggerated idea of the range of imitative words in language leads him into some very astonishing statements. If horses say *hlor*, and cows *ehé*, and serpents *hoff*, we can only say that the popular idea of their voices is grossly wrong. A glance at Pictet's *Origines Indo-Européennes* would dispel Dr. Wilson's delusive idea that the name of the beaver has anything to do with any imitation of its voice; and there are other things in the chapter as objectionable as these.

While acknowledging the value of Dr. Wilson's personal observations, and the number of useful details which he has collected and arranged, it is necessary to say that he is by no means a guide to be followed blindfold, and that only those students who have the opportunity of sifting the good from the bad are likely to receive much benefit from his present work.

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## ETHNOGRAPHIC DESCRIPTION OF THE PEOPLES OF RUSSIA.\*

By T. De PAULY.

Dedicated to the Emperor Alexander on the occasion of the Millenary Jubilee of  
the Russian Empire.

THIS is really a most magnificent work, and reflects the highest credit on Russian science and art, being illustrated by sixty-two coloured plates representing the types and costumes of all the peoples of the Russian Empire. M. Pauly, himself known as a patient and industrious investigator, has had the advantage of the assistance of Eckert, Ritter, Schott, Kœpper, Kounck, Brosset, etc. Ch. de Baer has furnished the introduction. The work is divided into five principal sections, namely, Indo-Europeans; Peoples of the Caucasus; Ouralo-Altaic Peoples; Peoples of Eastern Siberia; Peoples of Russian America. The sections are subdivided into chapters, each of which treats of a distinct nationality, with a description of its habits, history, organization, etc.

There is an appendix containing, (1) a plate representing the chief cranial types; (2) a statistical table founded on the last official documents; and (3) an ethnographic chromo-lithograph map.

The work has only one drawback, it is inaccessible from its price, which is not less than £35 sterling. Considering, however, that the designs have been furnished and executed by the most renowned artists, that the plates have been destroyed, and that only comparatively few copies have been printed; we do not think that the author will derive much advantage in a pecuniary point of view. It is rare, indeed, to see such a work attempted and successfully executed by the private resources of an individual.

We give an extract from Baer's introduction.

“Among the scientific works which distinguish the present epoch, none are more useful, and deserve to be received with more favour, than a new and complete description of the peoples of the Russian Empire. In our anthropological treatises we no longer restrict ourselves to carefully grouping the numerous varieties of man, but we attach the greatest importance to the diversity of the intellectual faculties of nations.

“A work which gives precise information on these interesting subjects, would both facilitate scientific research, and would be invaluable

\* *Description Ethnographique des Peuples de la Russie*, par T. de Pauly. 1862. St. Petersburgh.

to the government with regard to the administration of the respective countries."

The preceding remarks show that M. de Pauly has filled up a gap in the domain of science.

The area of the Russian Empire, in 1859, is estimated by Pauly at 400,000 geographical square miles, with a population of seventy-four millions. Of this number, fifty-five millions, that is more than three-fourths of the whole population, belong to the Slavonian race—the most numerous of the three principal European races, amounting to above 80,000,000 of souls. We find, thus, that of the various elements composing the population of the Russian Empire, the Slavonian greatly predominates, and *there only* maintains its sovereignty, not being, as elsewhere, subject to other nationalities. We shall, probably, have occasion to refer to this great work in a future number.

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## ON THE COMMIXTURE OF THE RACES OF MAN IN WESTERN AND CENTRAL ASIA.\*

By JOHN CRAWFURD, Esq., F.R.S.,

PRESIDENT OF THE ETHNOLOGICAL SOCIETY; HONORARY FELLOW OF THE  
ANTHROPOLOGICAL SOCIETY OF LONDON.

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AMONG the races that have played the most conspicuous part in history are the Jews, including under this name all the people of Palestine and Phœnicia. I imagine they are now everywhere more or less a mixed people. It is sufficient distinction for a small people, with a narrow territory, that they were the first to engage in foreign maritime commerce—that they founded Carthage, the rival of Rome; and that from among them sprang the two forms of religion which now prevail with half the inhabitants of the globe and all the more civilized.

The entire region occupied by the Hebrew race is not above a fourth part larger than the Principality of Wales. It is a country of mountains, rocks, deserts, but with some well-watered, and therefore fertile, plains and valleys. Near ten degrees beyond the tropic, Palestine in climate resembles the southern countries of Europe, and its natural products correspond, for it was a land of wheat and barley, of the vine and the olive. The race was, in energy and enterprise, far more European than Asiatic. Hemmed in by deserts and the

\* Extracted from a paper read before the Ethnological Society, March 17th, 1863.

Mediterranean, they seem to have made the most of their narrow bounds. Far beyond the reach of history, they had cultivated corn, had domesticated the most useful of the lower animals, were in possession of the useful and precious metals, and had invented phonetic writing, while their dull neighbours the Egyptians never went beyond clumsy symbols.

Had so energetic a race as the Jewish possessed an extensive territory, they would, no doubt, have become great and powerful conquerors. As it was, their obstinate valour did not hinder them from being subdued by every powerful people that attempted their conquest; so that for at least thirty ages they have been more or less intermixed with races both Asiatic and European.

At a very early age a colony of Jews settled in Egypt; and that they were not very grievously oppressed there, seems attested by the rapid increase which took place in their numbers. It was this colony which, escaping from bondage, returned to their parent country by the Arabian Desert, and subdued the cognate tribes that occupied it. We cannot suppose that in their long residence in Egypt, and during their tedious passage through the Desert, they did not commingle with Egyptians and Arabs, although usually solicitous to preserve the purity of their own blood. The man of genius who rescued them from Egyptian thralldom—led them through the Desert, and gave them laws and institutions, was himself married first to a Midianite—that is, it may be presumed, to an Arabian—and then to an Ethiopian—that is, to a Nubian—whose blackness was as unchangeable as “the spots of the leopard.” On coming into the promised land, it was, moreover, lawful for them, after destroying the males, to intermarry with the captive females without distinction of race.

In process of time the Assyrians conquered Palestine; in the first instance carrying off ten of the tribes into captivity, and then the remaining two. By this we are certainly not to understand that the Assyrians carried off the entire nation of the Jews. They would naturally carry off a selection only of ordinary prisoners, and all the leading men, to obviate revolt; for we cannot suppose even Oriental conquerors so insensate as to destroy the value of their conquest by reducing it to the condition of an unpeopled desert. The select few of two of the tribes were eventually permitted to return to their own country, but the banished of the ten tribes never had such permission, and being absorbed by the more numerous people among whom they were planted, they have, as an inevitable consequence, wholly disappeared as Jews, and hence the ten lost tribes will never be found.

Yet under the name of Samaritans, they were probably in race as much Jews as the people of Judea itself.

In due time Palestine was conquered by the Persians, and the Assyrians expelled. The Greeks conquered it from the Persians, the Romans from the Greeks, the Arabs from the Romans, and the Turks from the Arabs. We have here no fewer than six distinct races, or at all events nationalities, each of them for ages in possession of the parent country of the Hebrew race, embracing in all a period of five-and-twenty centuries, during which a commixture of their blood to more or less extent with that of the Jews was inevitable.

As to the Jews scattered over the wide world after the Roman conquest, it is clear that they are everywhere a mixed people, since everywhere they are found to partake more or less of the physical and even mental character of the races among which we find them. The Jews of England, Holland and Germany are often of fair complexion, with blue eyes and fair hair. The Jews of Poland and Russia have the Slavonian type; and those of Spain and Portugal, the Iberian. The Jews of Persia are very like Persians; while the Jews of India are black, and not distinguishable, bodily or intellectually, from ordinary Hindus. The Jews of China are as yellow as any Chinese, and instead of aquiline, have snub noses. The two last, indeed, are only Jews by religion, and hardly more so by race than the Buddhists of China and Japan are Hindus.

Wherever the Jews have intermixed with Asiatic races the result has been deterioration. Not so in Europe, for here they have neither undergone deterioration themselves, nor injured the race they have commingled with. Here we find them contending, on equal terms with the races among whom they are settled, in every pursuit open to their enterprise.

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### HAND-BOOK OF OVERLAND EXPEDITIONS.\*

THIS valuable little book has just been re-printed in this country, and its merits are so great that no traveller should be without it. Captain Burton has edited this edition, and much enhanced its value with some notes. The editor very modestly says:

“I have been induced to re-edit it, at the instance of my friend

\* *The Prairie Traveller*; a Hand-book for Overland Expeditions, with illustrations and itineraries of the principal routes between the Mississippi and the Pacific, and a map. By Randolph B. Marcy, Captain U. S. Army, (now General Marcy, Chief of Staff, army of the Potomac). Edited (with notes) by Richard F. Burton. Trübner & Co.

Mr. Trübner—not by the vain expectation of improving upon ‘a quarter of a century’s experience in (American) frontier life,’ and the work of an accomplished woodsman—but with the humble hope that a little collateral knowledge gathered in other lands, may add variety, and, perhaps, something of value to what is at present our best Hand-book of Western Field Sports. When that ‘late lamented institution,’ the once United States, shall have passed away, and when, after this detestable and fratricidal war—the most disgraceful to human nature that civilization ever witnessed,—the New World shall be restored to order and tranquillity, our shikaris will not forget, that a single fortnight of comfortable travel suffices to transport them from fallow-deer and pheasant-shooting to the haunts of the bison and the grizzly bear. There is little chance of these animals being ‘improved off’ the Prairies, or even of their becoming rare during the life-time of the present generation; those who love noble game may thus save themselves a journey to monotonous India, or to pestilential Africa.”

The editor also observes:

“Sad experience in the Crimea, proves that were the subject compulsorily rendered a part of military studies, it would contribute not a little to the efficiency of the service. Men would not then pine over ‘green coffee,’ with tons of bones lying around them waiting to become bonfires. They would not starve upon half-rations, nor reduce them to a quarter by injudicious management and an ignorance touching soup.”

This is a subject of deep importance, and one which we hope will be kept before the notice of the authorities of this country. We cordially agree with the editor when he says “I would rather examine officers in the art of travel than ‘put them through’ Roman history, or even Latin.”

This work is not only valuable to the prairie traveller, but it will be found to be equally serviceable to all who are embarking on solitary or company expeditions. It should be also studied by all officers in the army, and even Volunteer officers would do well to see what can be learnt from it.

The name of the editor has stamped this book as an authority on travelling generally. We only wish that Captain Burton had given us more of his vast experience. When the notes do occur they are always valuable. The editor very judiciously says, “Tobacco and green tea are the prairie traveller’s soothers and stimulants. Wine and spirits should be regarded as remedial agents.” The book itself is a complete epitome of what a traveller ought to know respecting stores, clothing, arms, and sanitary arrangements. For particulars we must refer the reader to the book itself. In speaking of the civilization of Indians, General Marcy observes:

“The Indians of the Plains, notwithstanding the encomiums that

have been heaped upon their brethren who formerly occupied the Eastern States for their gratitude, have not, so far as I have observed, the most distant conception of that sentiment. You may confer numberless benefits upon them for years, and the more that is done for them the more they will expect. They do not seem to comprehend the motive which dictates an act of benevolence or charity, and they invariably attribute it to fear or the expectation of reward. When they make a present, it is with a view of getting more than its equivalent in return."

On this statement the editor makes the following remark :

"Such is the morale of all savages. The battle of life, and the selection of species, compels every man to do unto his neighbour what he would *not* have his neighbour do unto him. The word 'gratitude' is not to be found in the dialects of the wild men. Even in Hindostan, it must be borrowed from Arabic or Persian. And when trying to obtain an African equivalent for 'honest,' the nearest approach to it is 'one who does not steal.'"

General Marcy also observes :

"I have never yet been able to discover that the Western wild tribes possessed any of those attributes which among civilized nations are regarded as virtues adorning the human character. They have yet to be taught the first rudiments of civilization, and they are at this time as far from any knowledge of Christianity, and as worthy subjects for missionary enterprise, as the most untutored natives of the South Sea Islands.

"The only way to made these merciless freebooters fear or respect the authority of our government is, when they misbehave, first of all to chastise them well by striking such a blow as will be felt for a long time, and thus show them that we are superior to them in war. They will then respect us much more than when their good-will is purchased with presents.

"The opinion of a friend of mine, who has passed the last twenty-five years of his life among the Indians of the Rocky Mountains, corroborates the opinions I have advanced upon this head ; and although I do not endorse all of his sentiments, yet many of them are deduced from long and matured experience and critical observation. He says :

"'They are the most onsartainest varmint in all creation, and I reckon tha'r not mor'n half human; for you never seed a human, arter you'd fed and treated him to the best fixins in your lodge, jist turn round and steal all your horses, or ary other thing he could lay his hands on. No, not adzactly. He would feel kinder grateful, and ask you to spread a blanket in his lodge ef you ever passed that a-way. But the Injun he don't care shucks for you, and is ready to do you a heap of mischief as soon as he quits your feed. No, Cap.,' he continued, 'it's not the right way to give um presents to buy peace; but ef I war governor of these yeer United States, I'll tell you what I'd do. I'd invite um all to a big feast, and make b'lieve I wanted to have a big talk ; and as soon as I got um all together, I'd pitch in and sculp about half of um, and then t'other half would be mighty

glad to make a peace that would stick. That's the way I'd make a treaty with the dog'ond, red-bellied varmints; and as sure as you're born, Cap., that's the only way.'

"I suggested to him the idea, that there would be a lack of good faith and honour in such a proceeding, and that it would be much more in accordance with my notions of fair dealing to meet them openly in the field, and there endeavour to punish them if they deserved it. To this he replied:—

"'Tain't no use to talk about honour with them, Cap.; they hain't got no such thing in um; and they won't show fair fight, any way you can fix it. Don't they kill and sculp a white man when-ar they get the better on him? The mean varmints, they'll never behave themselves until you give um a clean out and out licking. They can't onderstand white folk's ways, and they won't learn um; and ef you treat um decently, they think you are afeard. You may depend on't, Cap., the only way to treat Injuns is to thrash them well at first, then the balance will sorter take to you and behave themselves.'"

We must leave the discussion as to the truth of these assertions until a future occasion.

The following note is by the editor:

"Maugre some evidence to the contrary, I still believe that the North American Aborigine, like the Tasmanian and the Australian, is but a temporary denizen of the world who fails to succeed in the first struggle with nature. He is, like a wild animal, to be broken but not to be tamed; as the wolf can be taught to refrain from worrying, but cannot be made to act as a dog. In his wild state, the Indian falls before the white man. Settled and semi-civilized he dies of acute disease. He has virtually disappeared from the wide regions east of the Mississipi, and the same causes, still ceaselessly operating, point to his annihilation when the Prairie lands shall have become the grazing grounds of the Western World.

"It is a false sentimentalism that cannot look facts in the face; an unsound reverence that models Providence after its own fashion. The best and wisest book of this, or, perhaps, of any age—I allude to the *Origin of Species*,—which opens up the grandest views of life, is based upon a practical justification of the ways of eternal wisdom to man."

We can hardly fancy that the gallant captain's admiration of Mr. Darwin's book will be conceded by even all anthropologists. But it is not a little significant that the man who has travelled more largely than any one else living should come to the conclusion that Mr. Darwin's work is "the best and wisest of books in this, or, perhaps, of any age." We would only observe, in the words of a popular essayist, "there will be some who think his language too vehement for good taste. Others will think burning words needed by the disease of our time." Without, however, entirely sharing Captain Burton's admira-

tion of the *Origin of Species*, we still congratulate Mr. Darwin on having such an admirer. We also hope that such a man as Captain Burton will not be long allowed to remain buried at Fernando Po. He would be far more useful in England, assisting in training officers, travellers, and anthropologists, to be able to fulfil their respective duties as travellers and observers.

### OWEN ON THE LIMBS OF THE GORILLA.\*

THE first monograph of the present series of osteological comparisons of the bony framework of the anthropoid apes with that of man was published in 1835.\* Professor Huxley† terms it "a memoir which by the accuracy of its descriptions, the carefulness of its comparisons, and the excellence of its figures, made an epoch in the history of our knowledge of the bony framework, not only of the chimpanzee, but of all the anthropoid apes." Twenty-eight years afterwards, the series is complete, and the quarto volume of thirty-one pages and thirteen magnificent lithographic plates, which form the seventh and concluding part, is now before us. We shall extract a few of the more interesting passages, bearing upon the differences between the structure of man and the ape.

The proportions of the anterior extremity in the gorilla are here given in the greatest detail, and minute comparisons are given of the various separate bones. As regards the hinder extremity, Professor Owen says :

"The iliac portion of the os innominatum shows in the human species alone that degree of expansion and forward inflexion of its upper and anterior border occasioning the form that suggested the term *pelvis* or basin for the segment of the skeleton composed of the ossa innominata and sacrum. Every ape, until the gorilla became known to the anatomist, had presented an iliac bone, not only long and narrow, but flat or, if hollow, with the cavity directed backwards instead of forwards. Such is the strictly quadrumanous condition of the bone in the common chimpanzee (*Troglodytes niger*) as well as in the orang-utans and gibbons. In the gorilla the iliac bone, besides showing a greater relative breadth in proportion to its length than in the chimpanzee, has the upper and outer border a little bent forward,

\* "Osteological Contributions to the Natural History of the Anthropoid Apes." No. VII. Comparison of the Bones of the Limbs of the *Troglodytes Gorilla*, *Troglodytes niger*, and of different varieties of the Human Race; and on the general character of the skeleton of the Gorilla. By Professor Owen, F.R.S., F.Z.S., etc. — *Transactions of the Zoological Society*, 1862.

† *Man's Place in Nature*, p. 20.

giving a moderate concavity or pelvic character to that part of the skeleton; it is, however, much inferior in degree to the human pelvis. The difference of size between the *os innominatum* of the gorilla and that of man is enormous; this part of the great ape's frame would fit a human giant of ten feet in height. But besides size, there are well marked differences in form and proportion."

Like comparison is made of the femur.

"In man the tibia, after the femur, is the longest bone of the skeleton; but in the gorilla the tibia is the shortest of all the long bones of the limbs, being barely two-thirds the length of the humerus. It is nearly one-fifth shorter than the human tibia, but is of equal thickness in the shaft, and of greater thickness at the upper end."

The analysis of the differences in the feet is entered into in detail.

"The chief departure from the human type of foot . . . is the angle at which the innermost toe in the gorilla articulates with the tarsus; whereby it becomes an opposable thumb, as in other *Quadrumana*. In the orang-utan the foot is longer than the leg; in the gorilla it is nearly as long; in man it is shorter; thus the length of the tibia in a man being sixteen inches, that of the foot bones is ten inches; whilst in the gorilla, the length of the tibia being twelve inches and a half, that of the foot is twelve inches. The foot is so articulated with the leg in the gorilla that the sole is turned a little inward; the concavity of the sole lengthwise is greater than in man by reason of the permanent partial flexure of the toes, the disposition of the articular ligaments being such as to oppose some force to the attempt to press the toes into a straight line, such as they generally present in man. The transverse arch or concavity is less deep across the tarsometatarsal joints than in man. The tarsus is shorter in proportion to the foot, and is broader than in man. There is less inequality in respect of thickness between the hallux and the other digits, and greater inequality in respect of length than in man; above all, the innermost digit, by express modification of size and shape of the entocuneiform, is set at nearly a right angle to the other toes, converting the foot into a hand, and one gifted with a prodigious power of grasp."

Entering into detail, Professor Owen says of the entocuneiform:

"The entocuneiform of the gorilla differs chiefly in the form and shape of the surface for the metatarsal of the hallux; in man this surface is nearly flat, and forms or covers the forepart of the bone, presenting there a reniform figure; in the gorilla, the surface is convex transversely, curving from the fore to the inner side of the bone, and forming almost the anterior half of that side. The outer (fibular) third of the forepart of the entocuneiform is rough or nonarticular, and encroaches by a notch upon that border of the articular surface. The navicular surface is concave, and continuous with a narrow vertical tract for the entocuneiform. A second surface for the same bone is afforded by the posterior facet of an articular surface on the upper and outer part of the entocuneiform, the anterior facet of which articulates with the base of the second metatarsal."

As regards this latter, Professor Owen remarks :

“The metatarsal of the hallux in the gorilla shows a corresponding modification to that of the entocuneiform in regard to the shape and direction of its proximal articular surface, which is concave from side to side, and looks obliquely backward and a little outward, affording a favourable position and much freedom of motion of the innermost toe, as a flexible prehensile thumb of much power. The whole metatarsal is shorter and more slender than in man; the distal articular surface is more convex and bent down.”

Professor Owen sums up his retrospect of the pedal modifications of the gorilla as follows.

“In all the characters by which the bones of the foot depart in the gorilla from the human type, those of the chimpanzee recede in a greater degree, the foot being in that smaller ape better adapted for grasping and climbing, and less adapted for occasional upright posture and motion upon the lower limbs. The lever of the heel is relatively shorter and more slender, the hallux has still more slender proportions, and the whole foot is narrower in proportion to its length, more curved towards the planta, and more inverted, than in the chimpanzee.”

In the description of two beautifully lithographed plates from the photographs taken by Mr. Fenton from the specimens in the British Museum collection, Professor Owen enters in detail into the relative proportions of trunk and limbs in the gorilla. He says :

“The trunk of the gorilla, according to the human standard, would represent that of a giant of some eight feet in height, and the jaws and upper limbs have a proportional or corresponding magnitude; but the size of the constituent bones is such as to exhibit, in this part of the skeleton, much greater breadth, strength, and massiveness than is present in the Irish Giant of that height in the Museum of the Royal College of Surgeons. The upper extremities, though so long in respect of the whole body, bear to the trunk nearly the same proportions as in Man. Take away the lower limbs in both skeletons, and this similarity becomes more obvious. In both the lower ends of the antibrachial bones, as the arm hangs down, reach the same transverse line as the ischial tuberosities; and they ascend scarcely an inch below those parts in the chimpanzee. The embryonal proportions of the lower limbs bring down the stature of the gorilla below that of the average in the well-formed European. In a skeleton of such, measuring five feet nine inches from the vertex to the sole, the length of the trunk is two feet six inches; in the skeleton of a male gorilla, measuring five feet six inches, in an erect position as it can naturally be brought, the length of the trunk is three feet. From the vertex to the ischial tuberosities in the man measures three feet; in the gorilla it measures only three feet five inches, owing to the inferior height of the cranium, even with the parietal crest fully developed. The similarity of proportion of the upper limb to the trunk in length is

due mainly to the greater proportional length of the pelvis in the gorilla. The humerus in man extends as low as the interspace between the third and fourth lumbar vertebræ; in the gorilla it extends to that between the vertebræ answering to the fourth and fifth lumbar, but in man the humeral condyles hang nearly two inches above the iliac labrum, while in the gorilla they extend as far below that labrum. The tips of the fingers in man, when he stands erect, usually reach to the middle of the femora; in the gorilla they reach to about an inch from the lower end. The length of the bones of the upper limb in the human skeleton is two feet nine inches; in the gorilla it is three feet eight inches; in the Irish Giant it is three feet two inches and a half. The lower limbs, measured from the head of the femur to the under surface of the calcaneum, rather exceed in length those of the head and trunk together in man; in the gorilla they are nearly one foot shorter.

	Man..5 ft. 9 in.	Gorilla..5 ft. 6 in.
Length of head and trunk. ....	3 0	3 5
Length of lower limb.....	3 1	2 6

“The shorter lower limb of the gorilla is terminated by a longer foot than in man; the bony frame of that part measures twelve inches in length in the gorilla, and nine inches and a half in the human skeleton compared. The bony hand of the gorilla is ten inches in length; in the man it is seven inches and one-third.

“I would remark that whilst the bony frame of the gorilla shows the nearest approaches amongst apes to the truly human characteristics of the skeleton, it differs in a greater degree than does that of lower *Quadrumana* by its adaptive developments. These differences relate to the great bodily strength and power of bite of the gorilla, and do not approximate it to any lower form, assuredly not to the baboons with their short and narrow thorax, long and narrow pelvis, long loins, with anapophysially interlocked vertebræ, and short-spined neck-bones.”

As regards the skeletal variations in the different races of mankind, Professor Owen says—

“In these illustrations of the comparative osteology of the European and Australian, the physical superiority of the civilized man is exemplified. No known conditions of climate are more favourable to a perfect natural development of the ‘noble savage in his native wilds,’ free from all the restraints of so-called ‘artificial’ society, than that of Australia. The wild mammals of the woods and plains, and the teeming life of the sea, excite and reward the healthy exercise of the senses and muscular system of the aboriginal sportsman of that dry, sunny, and healthful land. Yet the advantage in regard to size and strength of body, especially as exemplified by the bony framework, is decidedly with the civilized European.”

## MAN AND BEAST.

TO THE EDITOR OF THE ANTHROPOLOGICAL REVIEW.

Sir,—The late work of Professor Huxley has attracted much attention amongst anthropologists; and as its learned author would say, it is the duty of the man of science “to reexamine the common stock in trade, so that he may make sure how far the store of bullion in the cellar, on the faith of whose existence so much paper has been circulating, is really the solid gold of truth.”

The vehement manner in which Professor Huxley has supported the theory of the derivation of Man from the inferior animals, has surprised many of those biologists who were aware of the equally vehement manner in which he had previously denied both progression and transmutation. There was a time, ten short years ago, when the same eloquence which is now employed in lowering “Man’s place in Nature,” uttered its vehement strains in the scientific theatre of Albemarle Street\* in disparagement of the transmutative doctrine. There was a time, when the alleged instances of transmutation afforded by the class of fishes were tested by the anatomical and embryological conclusions disclosed by Vogt. “Those theorists” who contended that there had been a progressive development of life since the globe first became habitable, commencing with the simplest forms of organization, and proceeding regularly upwards to the most complex, were severely criticized, and it was stated that such a view of creation was not compatible with the facts disclosed by geological researches. Professor Huxley at that time confidently assured his audience that a close examination dispelled the notion of progressive development, and proved that it had no solid foundation.

While recognizing to Professor Huxley, as to every other scientific man, a free and perfect right to change his opinions, we would have thought that some charitable feeling might have been due on his part to those zoologists who may be working out a theory of transmutation, and who may object to accept in its entirety the Darwinian system. Professor Huxley, however, tells us that this hypothesis of animal causation is the only one which has any scientific existence. We, on the other hand, prefer to suspend our judgment on the matter,

\* *Journal of the Royal Institution*, 1855.

regarding no transmutative theory as yet proven. That a future generation may witness the development of a more perfect theory than that of Mr. Darwin is extremely probable; and we think it most unfair that Mr. Huxley should put us in the alternative, "either Darwinian or nothing."\* The advocates of the Ptolemaic theory of the planetary motions, triumphantly unopposed, might have put the case "Ptolemy or nothing" prior to the age of Copernicus; and this use of the *argumentum ad ignorantiam* on their part would have inspired subsequent generations with a lower idea of their prescience than the old astronomers merit.

Professor Huxley states that—"The question of questions for mankind—the problem which underlies all others, and is more deeply interesting than any other—is the ascertainment of the place which man occupies in nature, and his relations to the universe of things."

Face to face with the present position of metaphysical thought in England, that anthropology which can find no higher employment for the human mind than the ascertainment of man's relations with the baboons will find no place at all. Even if the transmutation of species were demonstrated, and if the intervening links connecting the human species with the baboons were discovered, the psychical attributes which distinguish man from the inferior types baffle the analysis of the reasoner. Even on the assumption that the intellect of man is so directly coordinated with his material structure as to be dependent on the amount, complication, and quality of the brain, the vast cerebral gulf between man and the ape draws a wide line of demarcation between the psychical nature of the two forms. And when we glance at the vast and high frontal lobe of the human brain, the expanded median lobe, and the bulky and projecting occipital lobe, whose mass extends backwards far beyond the cerebellum, we see a substratum on which the psychical manifestations of man undergo their complicated changes and alternations. We cannot discover in the highest ape any such material organ.

With respect to these higher psychical manifestations which are not directly correlated with the nervous system, and the proof of whose existence does not rest upon the demonstration of *Man's Place in Nature*, we shall not allude to them here. Professor Huxley would not appreciate our argument, and we are content to say, *Dignius credere quam scire*.

To meet Professor Huxley on the more common ground of meta-

\* On our *Knowledge of the Causes of the Phenomena of Organic Nature*. 8vo. London, 1863, p. 150.

physical thought, we are surprised at the manner in which he disregards all the attributes of perceptive reason developed in man, and asserts that the highest knowledge is the knowledge of our relations to the outward world. A more subtle analysis of the hidden fountains of the human mind was revealed to us from the schools of Alexandria,\* and has been revived in the latter Germanic philosophy. A more noble occupation of the mind of the truly positive philosopher is that which, attempting to unravel the physiological and psychological significance of man himself, absolutely, as he stands, without reference to any other being, obeys implicitly the direction of Thales, *γνώθι σεαυτόν*. A more truthful task for the philosophic inquirer, would be like the fervent and nature-seeking philosopher of Berlin, who

“ Did cast into the depths of his own soul again  
The fearless glance, and there, with humble heart,  
Did prove the secret of all mythic thought,”

to discover those distinctions between the relations of brain and thought, on which alone a consistent science of psychology will be based.

It may appear strange that a writer who adopts the metaphors of the theological school of teleologists, should found the essential doctrines of his own philosophy on the teachings of the most advanced school of Materialists in Germany. When we glance over the pages of *Man's Place in Nature*, we are irresistibly led to the conviction that the voice is the voice of Büchner, though the words are those of Huxley. The learned author of *Kraft und Stoff* will, however, scarcely recognize his disciple in the tortuous involutions of metaphysical analysis through which he drags his weary auditor, with a view, firstly, to prove the analogy between the cerebral structure and a devised machine, and, secondly, to base our ideas of psychological variation on functional changes in the brain's structure.

Professor Huxley, in reply to the argument brought against him by the Rev. Mr. Molesworth and Mr. Luke Burke, who contended that “ the superior psychical manifestations of the human species must be associated with concurrent modifications of his bodily frame and organs,” says, “ The argument that because there is an immense difference between a Man's intelligence and an Ape's, therefore, there must be an equally immense difference between their brains, appears to me to be about as well based as the reasoning by which one should endeavour to prove that because there is a ‘ great gulf between a watch

\* Plotinus, *Enneades*, v, lib. 5.

that keeps accurate time, and another that will not go at all, there is, therefore, a great structural *hiatus* between the two watches. A hair in the balance-wheel, a little rust on a pinion, a bend in a tooth of the escapement, a something so slight that only the practised eye of the watchmaker can discover it, may be the source of all the difference.'"

The utter inapplicability of the comparison between a "moving thing that has life" and an engine-turned machine made by man, seems transparently obvious. Moreover, the watch simile is completely threadbare; it has been used *usque ad nauseam* by Nieuwentyt and Paley, and refuted by more accurate metaphysicians. Professor Huxley's expression, "all the difference," we do not consider to be justified by his argument. The "rust on the pinion" is, indeed, a structural *hiatus*, but we could conceive that the difference may arise from other causes. Expansion of the metal of the pendulum by heat would be a structural change that would also account for the stoppage, and we have no doubt that some analogous "difference in the combination of the primary molecular forces of living substance" might account for *some* of the variation between Man and the Apes, without confidently assigning to it the *vera causa* of the totality of differentiation.

Professor Huxley is forced (we presume by "atavism") to revert to the original definitions as propounded by Gratiolet; and the writer, who boasts of "having done his best to sweep away the vanity" of forming a classification based on physical characters, as understood by the old anatomists, and who alleges "that the attempt to draw a psychical distinction is equally futile," actually proposes the following tests of differentiation: "Let it be admitted, however, that the brain of man is absolutely distinguished from that of the highest known apes, 1st, by its large size, as compared with the cerebral nerves; 2nd, by the existence of the lobule of the marginal convolution; 3rd, by the absence of the external perpendicular fissure."

Certainly the above cannot be deemed "structural differences which shall be absolutely inappreciable to us with our present means of investigation," still less are they differences which we can deem to be modifiable under the operation of a law of natural selection. Of course, if we abrogate our position as students of truth, inductively ascertained, we can realise how long successive ages may have operated to influence the convolutions of the brain.

But the realization of such a chimerical dream belongs to that future period, which some hope is fast approaching, when the truths of science, which have been obtained through laborious efforts during

the past two hundred years, will be forgotten, and "natural selection," or some equally inconclusive figment of the imagination will be elevated as the dogma unto which all scientific men must yield belief.

The brightest periods of science and philosophy in past ages have often been succeeded by retrogressive epochs, similar in nature to the "new Saturnian age of lead," is now in the ascendant. To Germany and France, where the developmental sympathies of zoologists have not yet led them to propound a system so thoroughly at variance with ascertained truths as that of natural selection, we may look at some future time for the diffusion of a system demonstrating transmutation on grounds based on observed facts, and compatible with our present state of knowledge.

Professor Huxley's work is, however, styled *Evidence as to Man's Place in Nature*. The nature of this evidence it is the duty of the sincere anthropologist to sift, and we will endeavour fearlessly to perform this task as regards some of the facts which Professor Huxley brings forward.

Dissatisfied with the state of our knowledge respecting the measurement of the human skull, Professor Huxley proposes an entirely new system of classification. He says, "I have arrived at the conviction that no comparison of crania is worth very much that is not founded upon the establishment of a relatively fixed base line, to which the measurement in all cases must be referred. Nor do I think it is a very difficult matter to decide what that base line should be." He, therefore, selects a line as the normal base of the skull, or basicranial axis, which line passes through the centres of the bones termed basioccipital, basisphenoid, and presphenoid. He states that this basicranial axis is a relatively fixed line, or to which the arcs described by the various cranial axes form various planes, at angles all comparable with the given modulus afforded by the basicranial line. Professor Huxley has, therefore, completely pledged himself to the new system of craniometry proposed by him in his third essay "On the Fossil Remains of Man."

Six skulls are drawn on Professor Huxley's 79th page, respectively those of the Australian, squirrel monkey, gorilla, baboon, howler, and lemur. Glancing at these figures, the first impression which an inquirer, unacquainted with the anatomical details of the case, would be led unwarily to make, would be, that the figures were all drawn on one uniform plane, so as to show fairly the degree

of overlap of the cerebrum over the cerebellum in those apes in which an overlap is visible. Professor Huxley, however, does not adopt any such plan; the base line of each skull, parallel with the bottom of his page, is not the "basicranial" line suggested by him; it is not the "tentorial" line; it is not a line transverse to the axis of the occipital foramen; it is not transverse to the Abbé Frère's line from the *meatus* to the coronal suture; it is not the "glabella-occipital" line; nor is it the *longitudo racheos* of Von Baër. What then is it? It is a line drawn to give the cerebral cavity the same length in each figure respectively; a line which has the effect of placing the *mycetes* and *lemur* skulls at the foot of his plate at a distorted angle wholly at variance with that in which the other skulls are placed. The effect of this shifting process has been to double, at least, the postcerebellar overlap in the *chrysothrix*; to enlarge it from  $-0$  to  $+\frac{3}{10}$  to  $\frac{4}{10}$  inch in the gorilla and howler monkey, and almost to treble its dimensions in the baboon. We have rarely seen so peculiar an application of the pictorial *art de pose* in the production of figures intended for a general audience, and destined to illustrate nice points of scientific controversy. We are entirely at a loss to know what is the cause of this discrepancy. We catch, however, a glimmering light from the advertisement at the beginning. We are told that "the greater part of the substance of the following essay has already been published in the form of oral discourses, addressed to widely different audiences during the past three years." Peradventure one of the modes of cranial admeasurement which Mr. Huxley so seriously propounds belongs to the "pre-Darwinian" age of the controversy; peradventure it even dates its early embryonic existence to the period when Professor Huxley pleaded so strongly against the doctrines of transmutation. However this may be, and whatever change may have taken place in Professor Huxley's opinions, the system of measurement which he advocates in his second is wholly irreconcilable with that taken up in his third essay. His two propositions are mutually destructive. As he takes due care to impress on our minds that "it is the first duty of an hypothesis to be intelligible," this unaccountable laxity seems strangely out of place when applying an exact system of craniometry to the elucidation of "Man's Place in Nature."

Whatever criticisms we may pass upon the anatomical value of the facts put forward by Professor Huxley, we are free to admit that they are worthy far more serious consideration than those promulgated by

his followers. Sir Charles Lyell refers to alleged testimony\* on this point. We are in a position to estimate the scientific value of the generalization alluded to. It is sought—by the demonstration of the alleged fact that the verticality of the occiput in “Turanian” crania depends, not upon curtailment of cerebellum, but upon the curtailment of the posterior apical lobules of the cerebral hemispheres—to show that the great overlapping cerebral lobe is not a constant character in man. Rarely has an error so grave of fact, observation, and deduction been committed even by the most ill-informed phrenologists. It is true, that in many short-headed or brachycephalic skulls the cerebral lobes do not project far over, or may even, according to Retzius, fall short of the cerebellum. The demonstration of this fact rests on an examination of the bisected skull. The greatest authority on cerebral anatomy in Europe† has, however, warned us against too confident generalizations. He has pointed out that often a truncated occiput is correlated with an immense, a projecting occiput with an atrophied cerebral lobe. The allegation that we can predict by mere inspection of the outward aspect of the occiput of any skull the degree to which the cerebral lobes project over the cerebellum we regard as one which cannot be considered seriously on any scientific grounds whatever.

That which has tended very much to keep alive the controversy is, that some advocates of transmutation have shrunk from testing the truth of their theories before the world, and have neglected those public opportunities which have occasionally arisen for the elucidation of the question. The audience collected last year at the British Association (Section D) were told that they were “a somewhat promiscuous assemblage,” of “limited information,” and “scarcely competent to judge of matters of anatomical fact.” We have no sympathy for the deviser of this equivocal excuse for not telling a plain story, especially as we remember that some of England’s best zoologists and anatomists, the *élite* of British science, were present on the occasion. Messrs. Schröder van der Kolk and Vrolik say—“*Il paraît que l’année 1861 a été funeste en Angleterre aux Chimpanzés et aux Orangs.*” The year 1862 has been still more disastrous to the memory of the founder of systematic zoology. The remark has been made by a controversialist—“Why Linnæus named the *Cebus capu-*

\* “See also, on this subject, Professor Rolleston on the Slight degree of Backward Extension of the Cerebrum in some races of Men.—*Medical Times*, October, 1862, p. 419.” Sir Charles Lyell, *Antiquity of Man*; 8vo, London, 1863, p. 488.

† Gratiolet, *Bull. Soc. Anthropol.*, vol. ii, p. 257.

*cinus Cebus fatuellus* I know not." Zoologists of "limited information" certainly thought that Linnæus named it *Simia fatuellus*,\* and that the name *Cebus fatuellus* was given by Erxleben, in the year 1777, when the Swedish naturalist had long ceased to write, and only a year before his decease. It cannot be expected that even "a promiscuous audience" would be so credulous on a matter of elementary zoological fact as to believe that Linnæus gave generic value to the distinction between the Catarhine and Platyrrhine monkeys. We must not, however, expect too much from an author who, before the Royal Institution, spoke of the Vervet monkey as *Cercopithecus Lalandi*, ignoring altogether the labours of the deceased zoologist and true labourer, Isidore Geoffroy St. Hilaire † The illustrious Frenchman whose labours are thus slurred over has carefully pointed out the marks of distinction between the *Cercopithecus Lalandi*, Is. Geoff. (*C. pusillus*, Desmoulins), and the true Vervet, *Cercopithecus pygerythrus*, Desmarest; and when we see these two wholly distinct species confused together, we cannot but wonder in amazement what can possibly be the species of monkey to which such exceedingly vague reference is made.

The same writer, speaking of Schröder van der Kolk and Vrolik's *Note sur l'Encephale de l'orang*, confidently states, "so far as the ventricles go, (*sic in orig.*) the figures given in the current number of the *Natural History Review* might very easily be interchanged with that standing for human structures in the drawing of anatomists, who had never dreamt of contrasting these organs with those of the ape. And should any one retaining any lurking kindness for the posterior cornu, come thus warped, to decide which of the two figures was intended for the simious, and which for the human brain, infallibly his judgment would be wrong." We would ask any competent human anatomist to compare the anterior cornua of the orang and chimpanzee with those of man, and contrast the stunted, rounded, comparatively straight anterior horn of the ape's with its tapering, slender, divaricated homologue in man. No serious student, anxious only to arrive at a fair conclusion on the facts, and not by meretricious eloquence to enlist the sympathies of a "promiscuous audience," will venture to assert that they can "easily be interchanged." The criticism applied to Apollonides, "*Tu certe neque tu vides intelligis, neque tu audes memoria tenes*," is most applicable in the present case.

The mode in which the presence of a simial structure, admittedly

\* *Systema Naturæ*, ed. xii, vol. i, p. 43. *Systema Regni Animalis*, 8vo, p. 51.  
 † D'Orbigny, *Dict. Univ. d'Histoire Naturelle*.

homologous with the *hippocampus minor* in man is paraded, with a view to obscure our perception of its developmental inferiority, is a characteristic example of the reasoning of the new transmutative school. No zoologist, however, of any repute, has denied the existence of these rudimentary structures.

It would be utterly inconclusive, and at an absurd variance with logical necessity, to assert, because a first-rate man-of-war, carrying a hundred and twenty or a hundred and thirty guns, exhibited one of the highest forms of naval power, that consequently smaller craft must be entirely destitute of any armament whatever. The forced application of the dictum of the schools *de omni et nullo*, is wholly inapplicable to the spirit of zoological classification, which is founded rather on our ideas of subordination to known type than any class characters.

The skeleton of the orang would have afforded in the "*indice*" of the great toe, the same ground for impugning that zoological character of man which the brain of orang, in its "*indice du petit pied d'Hippocampe*" afforded in the denial of the "*hippocampus minor*" as a zoological character. A disingenuous advocate would have found the one just as serviceable for his purpose as the other. Viewed as discoveries, they are alike; but both closely resemble that of a certain nidamental structure, which gives, usually, but a short-lived pleasure to its finder.

In the above observations which it has been our duty to make on Professor Huxley's work, we have endeavoured while criticising his method of inquiry to recognize the fact that a derivative origin of the whole of the animate creation may be hereafter proved by accurate scientific induction. The day is long gone by when the probability of transmutation could be sneered down as the phantasm of a dreamer, or the product of the scepticism of an infidel. The possibility, nay, even the extreme likelihood of such a law being eventually established is now rapidly becoming a tolerated doctrine in the creed of deep thinking scientific men. Should such a theory be proved, it must be borne in mind that until it is so inductively demonstrated by observation, experiment, or well grounded inference, we are not entitled to assume its existence. If there is such a derivative law, and we have now the sanction of some of our highest zoologists to believe in its existence, when the time comes we shall not shrink from applying it to the discovery of the genesis of the human species. We have no real fear that the consequences which may result from the practical application of this law will be prejudicial to religion, morality, or society. It is the duty of scientific teachers to endeavour

to discover this law; it is the duty of those who are sincere votaries of the truths of science to accept the law when it shall have been inductively proved. But, until the day comes when such a law shall be fully, entirely, and satisfactorily established, we must strenuously protest against the diffusion, even amongst "the wider circle of the intelligent public," of essays, the object of which is to render "Man's place in Nature" closer to that of the brute creation. Professor Huxley's work is especially obnoxious to criticism, as it does not import a single new fact into the treasury of scientific knowledge; it contains no exalted views as regards man's true position, and the volume generally is destitute of that spirit which aims at the diffusion of accurate truths, ascertained by careful and patient investigation, and presented to the world in a temperate and ingenuous spirit.

We are now at the very threshold of the great controversy respecting man's true zoological position. To all those who may feel disposed to investigate the subject, and who may be inclined either to check free inquiry, or to rush hastily to a dogmatic conclusion, we would say, in the words of the philosopher of Königsberg, whose mental teachings have revolutionized the thoughts of mankind.

"Let each thinker pursue his own path; if he shews talent, if he gives evidence of profound thought, in one word, if he shows that he possesses the power of reasoning, reason is always the gainer. If you have recourse to other means, if you attempt to coerce reason, if you raise the cry of 'treason to humanity,' if you excite the feelings of the crowd, which can neither understand nor sympathize with such subtle speculations, you will only make yourselves ridiculous. For the question does not concern the advantage or disadvantage which we are expected to reap from such inquiries; the question is merely, how far reason can advance in the field of speculation apart from all kind of interest, and whether we may depend upon the exertions of speculative reason, or must renounce all reliance upon it. Instead of joining the combatants, it is your part to be a tranquil spectator of the struggle—a laborious struggle for the parties engaged, but attended in its progress, as well as in its result, with the most advantageous consequences for the interests of thought and knowledge."\*

Ἀνθρώπος.

\* *Kritik der Vernunft.*

## MEDICAL PSYCHOLOGY.\*

MR. DUNN is well known as one of our most industrious physiologists. A proof of this conclusion is to be found in the work before us, compiled during the frequent hasty leisures of an arduous professional life, and comprising some of the most florid expositions of the peculiar doctrines of the Idealist school of physiology. Mr. Dunn's generalizations to a great extent are connected with those of the phrenologist; we feel, however, that we should be doing him an injustice were we to classify them as phrenological. On the contrary, the influence of the school of Gratiolet is clearly manifest in some of Mr. Dunn's conclusions. The following is Mr. Dunn's classification of the various modes of nerve-action.

"Nervous actions are of a threefold character—physical, or *excito-motory*; sensory, or *sensori-motor*; and volitional, or *intelligent*. But it is only in the highest class—the vertebrata, and where there exists a cerebro-spinal system—that we recognize the existence and co-ordination of all these different kinds of nervous actions. In the very lowest animal organisms, the physical or excito-motory alone are present. These are essentially automatic, and occur without sensation; to them, in the invertebrate kingdom, and as typical of animal life, the sensory or sensori-motor are superadded; whilst it is solely in the vertebrate series that the intelligent and purely voluntary come into play. Throughout the whole of the vertebrate subkingdom, the type of the nervous system, including man himself, is the same. It admits of a threefold division, in accordance with its functional endowments and co-ordinations—into,

"1. The physical or excito-motory and reflex—the true spinal system of the late Dr. Marshall Hall.

"2. The nutritive and secretory, or ganglionic system, administering to the functions of animal life.

"The sentient, percipient, and intellectual, or the cerebro-spinal system."

As regards the brain, the conclusions of Leuret and Foville are thus adopted by Mr. Dunn.

"Throughout the whole of the vertebrate subkingdom, the type of the brain is the same; and, on a general survey of the series, it cannot escape observation that the longitudinal convolutions, from their

\* *Medical Psychology*; comprising a brief Exposition of the leading Phenomena of the Mental States, and of the Nervous Apparatus through which they are manifested, with a view to the better understanding and Elucidation of the Mental Phenomena on the Symptoms of Disease. By Robert Dunn, F.R.C.S., England. 12mo. London, 1863.

first workings out, increase in number, volume, extension backwards, and in complexity of structure, as the animal rises in the scale of intelligence, and as the range of its perceptive activities widens. To unravel all the complexities of the intimate structure of the cerebral hemispheres has hitherto baffled the most eminent anatomists, with all the appliances that science can furnish; but Foville and Leuret have clearly shown that these hemispheres are chiefly made up of three distinct series of convolutions—the *longitudinal*, the *commisural* or *anastomosing*, and the *transverse series*. The longitudinal series are the first to be developed; and, according to Foville, they arise from a common central nucleus, the *locus perforatus*, and are closely banded together. It is indisputable that the internal convolutions are the primitive basement convolutions of the hemispheres, forming the broad lines of demarcation between the sensory and perceptive ganglia, between the sensational and perceptive apparatus; they are the central organs of the perceptive consciousness, and therefore the common portals to intellectual action and volitional power. Now, since these basement convolutions are the first developed, and as the whole series of longitudinal convolutions arising from the same central part are most intimately connected and associated with each other, and are commissurally banded together, my own mind rests in the conviction that *an unifying bond of action pervades them*, and that the entire series of longitudinal convolutions, as an aggregate or whole, constitutes the nervous apparatus of the perceptive consciousness—in other words, the instruments of all our immediate or intuitive cognitions; not only the seat of the perceptive faculties, through the instrumentality of which, by the inlets of the special senses, we acquire a knowledge of external existences, their sensible qualities and physical attributes—of the differences and relations of things, their order or arrangement and numbers, and the phenomena of their action or events; but also of those purely ideational activities which form constituent elements in the composite nature of the personal or individual and social affections, and of the emotional, moral, and religious feelings of man.”

We would remark on this passage, that we presume the longitudinal convolutions are developed in the Australian races and the Andaman Islanders; and we can only express our silent wonder how their “individual or social affections,” and “emotional, moral, and religious feelings,” are correlated with their brain development.

Mr. Dunn suggests what we believe to be a novel interpretation of the transverse convolutions of the brain.

“After further observation and reflection, I have been led to another generalization, for the establishment or refutation of which I would appeal to the observations of the naturalist, as well as to the anatomical researches of the comparative anatomist. My own mind, at present, rests on the conviction that the vesicular matter of the transverse convolutions on the surface of the hemispheres furnishes the material conditions, the substratum, for the manifestation of the

highest psychical activities : in other words, that the transverse series, as an aggregate or whole, is the nervous apparatus of the intellectual consciousness.

" It cannot be denied that the transverse are anatomically a distinct series of convolutions. They do not spring from the same central part as the longitudinal ; they have not a common origin, nor any direct connexion with the *locus perforatus*, though the two series are most intimately connected and closely associated by a third, the commissural or anastomosing, through the instrumentality of which a co-ordinating and unifying action is maintained throughout the whole of the hemispherical ganglia. They are almost exclusively human, but not altogether and entirely so ; still, wherever they do exist, as they manifestly do in the horse and the elephant, there we have unmistakable evidence of the manifestation of *reasoning processes* being at times carried on. Now, as the longitudinal convolutions of the hemispheres increase in number, volume, and complexity of structure, in the same ratio as the perceptive activities of the animal increase in number, and as the range of their action is widened, so do I hold and believe that, on an appeal to nature, it will be found that the transverse convolutions, from their first appearance on the surface of the hemispheres, become more distinct and numerous as the animal rises in the scale of intellectual being, and as phenomena of the intellectual consciousness become more unequivocally manifested by it."

The differences between man and the inferior animals are thus defined by Mr. Dunn. Admitting that the sensory-apparatus of man are inferior in degree to those of the animals, Mr. Dunn alleges :

" But the difference between him and them rests specifically and fundamentally in the *greater number* and *higher order* of his psychical activities—in his intellectual, moral, and religious endowments, his reasoning and reflective powers ; for the lower animals are alike destitute of the highest plane of perceptive development—of the frontal, towering, and backwardly extending convolutions—the seat of the moral and religious intuitions—the *sole prerogatives of man* ; and, through the whole series, with some rare exceptions among the highest mammalia, of those characteristically large and deep, but unsymmetrical transverse convolutions on the surface of the hemispheres, 'adorning the human brow as with a diadem,' and which, as I believe, are the seat of the faculties of the intellectual consciousness—of imitation, imagination, ratiocination, and reflection—in fine, of the faculties of calculation, of order or arrangement, of comparison and causality, of ideality and wonder."

He further goes on to cite the parrot and the mocking-bird, the horse and the elephant, as examples of brains possessing "transverse convolutions on the *surface* of the hemispheres," and (if we understand him correctly) correlates this cerebral complication with the higher degree of mental energy manifested by these animals.

Into the purely pathological portions of this interesting little work

we shall not enter; we have no doubt that the medical profession, for which they are especially intended, will peruse them with the deepest interest. Mr. Dunn's previously published papers on "The Unity of the Human Race," conceived frequently in a spirit which transgresses the bounds of proved inductive science, illustrate a phase of anthropological thought which we believe is rapidly passing away. We, however, commend the present little work to the attention of our readers as one which places the theories of the physiological school, in which Mr. Dunn is a teacher, in a pleasant and palatable form before the public.

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### ON THE DISCOVERY OF SUPPOSED HUMAN REMAINS IN THE TOOL-BEARING DRIFT OF MOULIN-QUIGNON.

By ALFRED TYLOR, Esq., F.G.S., F.L.S.

A NOTICE of the discovery of human remains in the celebrated gravel-pit of Moulin-Quignon, near Abbeville, appears in *F. Abbevillois* of April 9th, 1863. The important details are as follows. At the end of last March a quarryman named Halatre, who was working in this quarry, brought M. Boucher de Perthes a shaped flint with a fragment of bone, both stated to have been found there. On clearing away the sand in which this fragment was imbedded, M. Boucher de Perthes found it to be a human molar much damaged. He immediately followed Halatre to Moulin-Quignon, verified the spot from which the hatchet and tooth had been taken, ascertained that the place was free from any infiltration or intrusion, and had the search continued, but for that day without success. Feeling sure that some other remains of the body to which this molar had belonged ought to be found there, M. Boucher de Perthes charged the workmen not to disturb anything they might come upon during his absence, but to let him know if anything came to light, and on the 28th of March a quarryman named Vasseur came to tell him that something resembling a bone was to be seen in the bed of gravel. M. Boucher de Perthes went to the place, found the extremity of the bone enveloped in its matrix, visible to the extent of nearly an inch: the bone was carefully extracted whole by working round it with a pickaxe, and proved to be a human jaw, very much discoloured, but not injured by rolling. The jaw, on a cursory inspection, showed no marked deviation from the ordinary type, was light, and not converted into phosphate of lime. A few inches off was a flint hatchet, also imbedded in the gravel, whence M. Oswald Dimpré removed it, but not without having to use a pickaxe in this case also. All the spectators were struck with the perfect identity of the patina or coloured crust which covered not only the jaw and the flint axes, but also the rolled pebbles of the bed, and the colour of which, a brown approaching to





M<sup>RS</sup> MACKIE, LITH.

PORTION OF FOSSIL JAW.

FOUND AT MOULIN GUIGNON, 28<sup>TH</sup> MARCH, 1856.

black, contrasted remarkably with the yellow tint of the gravel beds above and the grey of the underlying chalk. The jaw and the hatchets were about five yards below the surface, and close to the chalk.

A few days later, however (on the 13th of April), Mr. Prestwich, Mr. Evans, and myself, visited M. Boucher de Perthes, and observed circumstances which led us to fear that a deception had been practised by the quarrymen. It appeared to Mr. Evans, on inspection, that the axes had been artificially stained with the iron deposit of the gravel. The external surface of the flints bore evidently the marks of recent fractures, and were distinguishable also by their shape from the well known shapes of Amiens and Abbeville. On being put into water for a time the flint axes looked so much changed that it seemed likely that a good brushing would have brought the whole of the colour away, an opinion confirmed afterwards by experiment. Moreover, the presence of certain flints lying on a heap in the quarry, which flints had evidently been practised upon, did not escape the experienced eye of Mr. Evans. Mr. Prestwich's examination of the bone and teeth led him to suspend any opinion of the genuineness of the relics until he had made further investigations.

M. Boucher de Perthes, however, took a different view of the matter. He said that he had extracted the jaw bone from the substance of the bed itself, and that M. Dimpré had taken out the axe in the same way, in the presence of a number of spectators, and that they felt sure that the gravel had not been in any way disturbed. He had a high opinion of the two men, whom he considered to be persons of irreproachable character.

In the *Abbevillois Journal*, for April 18th, there is a further account of M. Buteux and Mr. Brady, who have also found implements in the same bed. While residents, like M. Boucher de Perthes, have rarely found any object of interest, it seems strange that these gentlemen should have been so fortunate.

On the other side of the question it is to be remarked that M. Boucher de Perthes has for many years offered large rewards for the discovery of fossil remains in the quaternary deposits, and that quarrymen have repeatedly brought him bones which they represented to have been found in undisturbed drift, but which he found to be not genuine. There are, however, bone-bearing gravels not far from Abbeville.

That the quarrymen of Abbeville and Amiens began to make sham drift implements, as soon as it paid them to do so, is well known, and the number of such imitations, which have been sold to unwary tourists, amount to thousands. The skill which these men have attained to in imitating the real drift implements is so great, that only the most experienced observers can be sure of their judgment, and, even then, have often to rely more upon the patina and the discoloration of the surface of the flints than upon the shaping. At one locality the quarrymen offered Mr. Henry Christy, one of the best judges of stone implements in England, a basketful of flint axes, etc. He selected the few genuine ones, and gave a proper price for them, and offered a penny or twopence apiece for the counter-

feits. The men protested and pledged their honour, quite as earnestly as M. Boucher de Perthes' townsmen could have done, that the implements were all genuine, till Mr. Christy quietly suggested that the long winter evenings were just coming on, so that they would have plenty of time to make a fresh batch for the spring tourists. This was too much for them, and they let him take the false implements away at his own price.

Further investigations may possibly prove either that the bone is genuine, or not. At present the discovery cannot be accepted as proved, as there are such strong grounds for suspecting that years of practice in fabricating sham antiquities, with the additional stimulant of the reward offered by M. Boucher de Perthes, have at length enabled the-quarrymen to put bones and implements into the gravel so skilfully as to deceive even the Patriarch of Primeval Archæology himself.

What we want to know is if the colour on the human jaw is merely a tint, or if it permeates the internal structure, and we may hope that this point may be soon settled. It would be well to ascertain the specific gravity of the jaw. It is possible that the human remains may have been obtained from the Roman cemetery at Amiens, or the Merovingian burying ground near Montreuil, from which numerous remains are on sale at Abbeville. The ramus of the Abbeville jaw is more oblique than ordinary, and is incurved, but such forms are not uncommon in Europe, although they may be characteristic of some Australian races.

We should not expect the gravel of Abbeville to be favourable for the preservation of human remains that may have been imbedded in it. It contains no fine sands charged with mollusca in which delicate bones might be preserved.

We saw the fragment of human jaw in the collection of the Marquis de Vitré; but in this case also there is a difficulty, as the marquis had left the cave a few minutes previously to the discovery of the specimen.

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## NOTICE OF A CASE OF MICRO-CEPHALY.

By R. T. GORE, Esq., F.A.S.L., ETC.

I HAVE much satisfaction in offering to the Anthropological Society a contribution towards the important objects for which it is instituted, and which presents some special points of interest on a subject comparatively new in its scientific relations. Many of the members of the society are, I am aware, well acquainted with the valuable essay of Wagner on the subject (*Vorstudien*, Th. 2), of micro-cephaly; and, therefore, in describing the physical and mental conditions of the

case I now submit, I shall mainly limit myself to description and history, guided by a constant reference to that eminent man's production.

The individual in question, now some years dead, was for a long time (several years), under my own observation. She was a female, the offspring of healthy parents, and without any known instance of idiocy or defective intellect in the family. She lived to her forty-second year, and died of phthisis. Her height was about five feet, her figure slight and rather well proportioned. She menstruated with regularity for some years after puberty, but had ceased to do so for some years before death. As far as I am aware no sexual propensities ever showed themselves.

As regards intellect, the best expression that can be used is to say, that it was infantine; *i.e.* corresponding to that of a child three to four years of age, beginning to talk. She could say a few words, such as, "good," "child," "mama," "morning," with tolerable distinctness; but without connection or clear meaning, and was quite incapable of anything like conversation. Her habits were decent and cleanly; but she could not feed herself, at least with any degree of method or precision. She was fond of carrying and nursing a doll. In walking, her gait was unsteady and tottering, the heels not bearing with any firmness on the ground.

As regards the skull, the photographs will give a better idea of the exterior than any description, though they, perhaps, fail to show the perfection of all the sutures, and the absence of anything like consolidation (*Synostosis*)—a point that negatives the notion that premature consolidation of the bony case has any effective part in bringing about the arrest of development characterizing such cases. The large orbits, with the comparatively narrow inter-orbital space, give some approximation to an ape-like character to the facial region; but, on the other hand, the transverse diameter of the face is proportionally rather large.

The best idea of the interior of the skull will be afforded by the plaster cast exhibited, which is at least fairly correct. The sphenoidal alæ (anterior), are sharply and well defined, as are also the margins of the sella turcica. The petrosal ridge is a good deal elevated, and well marked, with a very deep depression at its mesial and anterior extremity for the lodgment of the Gasserian ganglion. All foramina for nerves, etc. are proportionally large and well marked. The occipital foramen is situated far back, *i.e.*, at a point corresponding to one-fifth of the antero-posterior diameter of the basis cranii, which measures 4·25 inches (say 106 millimetres). The greatest transverse

diameter is 3.25 inches (say 84 millimetres). The occipital foramen is 1.25 inch long (31 millimetres), and 1.125 inch wide (28 millimetres). The crista galli is well marked and projects fairly within the cranium, leaving a rather deep but narrow fossa on each side. The greatest depth of the cranium corresponds to the region of the vertex, and may be taken as 2.625 inches (68 millimetres).

The relations of the brain and cerebellum to each other are shewn by the photographs, due allowance being made for flattening unavoidably consequent on even careful suspension in spirit; though to obviate this, much care was originally taken by well supporting and maintaining a due position on and in a thick bed of horse-hair. The cast of the interior of the skull, though less sharp than could be wished, may also be relied on for the same purpose. Leaving a due estimate of the character and meaning of the cerebral convolutions as well shown in the photographs, I content myself with noting the narrowing of the anterior lobes towards the apex, the comparative breadth of the hemispheres, the well-marked separation of the posterior lobes, and their extreme shortness, whether considered absolutely, or with reference to the portion of cerebellum left uncovered. The length of the *cerebrum* is now, after long maceration in alcohol, 3.1 inches (77 mill.). The extreme breadth of each hemisphere is 2 inches (50 mill.). The length of the posterior lobe from the apex to a well-marked fissure at its inner margin is 1.1 inch (27 mill.). The portion of cerebellum left uncovered is 0.8 inch (20 mill.). The parts of the base of the brain will be seen in the photograph to be well marked and developed in due proportion to the superior parts. The cerebellum is proportionally large, and all its parts well developed, as are, also, the component parts of the medulla oblongata.

The weight of this brain is remarkably small. Carefully weighed when recent, after the membranes and vessels had been removed, it weighed 10 ounces 5 grains (avoirdupois)=4380 grains=283.75 grammes. I see no reason to doubt the correctness of the memorandum made at the time (now some years since), as I find, on again weighing it, after having been long immersed in alcohol frequently changed, that the present weight is  $7\frac{1}{2}$  ounces (avoirdupois)=3281.75 grains=212.75 grammes, or less by, say, *circa* one-fourth: a fair correspondence.

I abstain from any attempt to enter upon any estimate of the special development of individual convolutions, or groups of convolutions, as designated by Gratiolet and Wagner, knowing that this

matter will be subject to the observation and judgement of those who are more competent than I can pretend to be, even had I sufficient leisure to enter fully into the needful study of them. For the purpose of such judgement I trust that the photographs will be found available and adequate.

I venture on some remarks that suggest themselves on other points:—

1st. The subject of this case was a female, which appears to be rather exceptional.

2nd. There is a total absence of evidence of disease having been concerned in the production of the micro-cephaly; the bones, sutures, cerebral texture and membranes being perfectly normal.

3rd. The mental condition well corresponds with the idea of arrest of development of the brain at some comparatively early period, probably during intra-uterine existence. As already stated, the mental phenomena were very similar to those of early infancy; contrasting in all respects very strongly to those which we usually associate with the conception of idiocy, in the common acceptation of that word.

4th. The weight of the brain, etc. is unusually small, being 283·75 grammes, as against 300 grammes in Theile's case (Wagner, *Vorstudien* 2, s. 19).

Independent of the cases of micro-cephaly enumerated by Wagner, there are some others that appear to have escaped his notice. One by Spurzheim (*Anatomy of the Brain*, London, 1826), figured as the brain of an idiot girl, at Cork. Of this brain I have a cast, which originally belonged to Spurzheim, and presents the closest resemblance to his figures. This cast is now in the care of Mr. Flower, Conservator of the Museum of the Royal College of Surgeons.

In the appendix to his *Anatomy*, (London, 1830), are figures of another brain of the same character, shewn to him by the late Mr. Stanley. This, no doubt, is one of two brains, with the corresponding skulls, now in the museum at St. Bartholomew's Hospital, and carefully described in the catalogue thereof. The brain of the second (a, 123) is of a male, and stated to weigh 13 ounces, 2 drams (avoirdupois)=332 grammes. It has also been described by Professor Owen, "On the Osteology of the Chimpanzee, etc., etc." *Trans. of Zoolog. Society*, vol. i, p. 343.

I conclude by asking the indulgence of the members of the Anthropological Society for these hastily compiled notes on a subject that I am aware is well calculated to interest them.

## NOTES ON SIR CHARLES LYELL'S ANTIQUITY OF MAN.\*

By JOHN CRAWFURD, Esq., F.R.S.,

PRESIDENT OF THE ETHNOLOGICAL SOCIETY. HONORARY FELLOW OF THE ANTHROPOLOGICAL SOCIETY OF LONDON.

IN his introductory remarks Mr. Crawford stated that in his observations on Sir Charles Lyell's book he should strictly confine himself to those branches of the subject on which he had bestowed special attention. He stated his conviction that the evidence which of late years had been adduced, giving to the presence of man on the earth an antiquity far beyond the usual estimate of it, is satisfactorily established, and that there can now be no question that man was a contemporary of animals, such as lions, hyænas, elephants, and rhinoceroses, extinct far beyond the reach of human record. Among the evidences brought forward to prove the antiquity of man, the paucity of relics of his own person, compared with the abundance of those the unquestionable work of his hands, has attracted special notice. That scarcity of human remains, compared with those of the lower animals, might, he thought, be to some extent accounted for. In the savage state man is ever few in number compared with the wild animals; and when he first appeared on earth—when naked, unarmed, without language, and even before he had acquired the art of kindling a fire, the disparity must have been still greater. In that condition he would have to contend for life and food with ferocious beasts of prey, with nothing to depend upon but a superior brain. In such circumstances the wonder is, not that he should be few in number, but that he should have been able to maintain existence at all. Sir Charles Lyell adopted the theory of the unity of the human race, which no doubt best accords with the hypothesis of the transmutation of species; but neither he nor any one else has ventured to point out the primordial stock from which the many varieties which exist proceeded. We see races of men so diverse, physically and mentally, as Europeans, negroes of Africa, negroes of New Guinea and of the Andaman Islands, Arabs, Hindus, Chinese, Malays, Red Americans, Esquimaux, Hotentots, Australians, and Polynesians. So far as our experience carries us, these races continue unchanged as long as there is no intermixture. The Ethiopian represented on Egyptian paintings four thousand years old is exactly the Ethiopian of the present day. The skeleton of an Egyptian mummy of the same date does not differ from that of a modern Copt. A Persian colony settled in Western India a thousand years ago, and rigorously refraining from intermixture with the black inhabitants, is not now to be distinguished from the descendants of their common progenitors in the parent country. Recent discoveries enable us to give additional evidence of the most instructive kind. Sir Charles Lyell himself stated, "The human skeletons

\* Extracted from a paper read before the Ethnological Society, April 14th, 1863.

of the Belgian caverns, of times coeval with the mammoth and other extinct mammalia, do not betray any signs of a marked departure in their structure, whether of skull or limb, from the modern standard of certain living races of the human family." In the same manner the human skeletons found in the pile buildings of the Swiss lakes, and computed by some to be twelve thousand years old, differ in no respect from those of the present inhabitants of Switzerland. If the existing races of man proceeded from a single stock, either the great changes which have taken place must have been effected in the locality of each race, or occurred after migration. Now, distant migration was impossible in the earliest period of man's existence. With the exception of a few inconsiderable islands, every region has, within the historical period, been found peopled, and usually with a race peculiar to itself. To people these countries by migration must have taken place in very rude times, and in such times nothing short of a great miracle could have brought it about. He concluded, then, that there is no shadow of evidence for the unity of the human race, and none for its having undergone any appreciable change of form. If one thousand years, or four thousand or ten thousand years, or a hundred thousand, supposing this last to be the age of the skeletons of the Belgian race contemporary with the mammoth, it is reasonable to believe that multiplying any of these sums by a million of years would yield nothing but the same cipher. Sir Charles Lyell, Mr. Crawford observed, has adopted what has been called the Aryan theory of language, and fancies that he finds in it an illustration of the hypothesis of the transmutation of species by natural selection. The Aryan or Indo-European theory, which had its origin and its chief supporters in Germany, is briefly as follows. In the most elevated table-land of Central Asia there existed, in times far beyond the reach of history or tradition, a country, to which, on very slender grounds, the name of Aryana has been given, the people and their language taking their name from the country. The nation, a nomadic one, for some unknown cause betook itself to distant migrations, one section of it proceeding in a south-eastern direction across the snows and glaciers of the Himalayas, to people Hindûstan, and another in a north-westerly direction, to people Western Asia and Europe, as far as Spain and Britain. The entire theory is founded on the detection of a small number of words, in a mutilated form, common to most, but not to all, the languages of Western Asia and Europe—a discovery, no doubt, sufficiently remarkable, but clearly pointing only to an antiquity in the history of man far beyond the reach of history or tradition. On the faith of these few words, and as if language were always a sure test of race, people bodily and intellectually the most incompatible—the black, and the tawny, and the fair; the ever strong and enterprising, the ever weak and unenterprising—are jumbled into one undistinguishable mass, and, with extraordinary confidence, pronounced to be of one and the same blood. A language which the theorists have been pleased to call the Aryan is the presumed source of the many languages referred to. But the Aryan is but a language of the imagination, of the existence of which no proof ever has been or can ever

be adduced. The Aryan theory proceeds on the principle that all languages are to be traced to a certain residuum called "roots." Some languages either are so, or are made to be so by grammarians. The copious Sanskrit is said to be traceable to some one thousand nine hundred roots, all monosyllables. The languages to which he had given special attention are certainly not traceable to any monosyllabic roots. In their simplest forms, a few of the words of these languages are monosyllables, but the great majority are bisyllabic or trisyllabic, without any recondite sense whatever. But were the Aryan or Indo-European hypothesis as true as he believed it to be baseless, he could not see how it illustrates, or can have any possible bearing at all on the theory of the transmutation of species by natural selection, the progress of which is so slow—if, indeed, there be any progress at all—that no satisfactory evidence of it has yet been produced. The changes in language, on the contrary, are owing to forces in unceasing and active operation, and the evidences are patent and abundant. They consist of social progress, and of the intermixture of languages through conquest, commercial intercourse, and religious conversions. Sir C. Lyell gives it as his opinion that no language lasts, as a living tongue, above one thousand years. As the authentic history of man is not above three times that length, and as, in some quarters of the world, the vicissitudes of language have been unquestionably great, it would no doubt be difficult to produce examples of a much longer duration. The Arabic, however, may be cited as a language which has had a somewhat longer duration, for the Koran is good Arabic at the present day, after the lapse of twelve hundred and forty years; and when the stationary state of society which belongs to East, and the peculiar physical geography of the native country of the Arabs are considered, Mr. Crawford said he saw no reason why it may not have been of twice the duration assigned to language by Sir Charles Lyell. He was told by competent judges that, saving the loss of its dual number and middle voice, modern Greek does not materially differ from ancient; and if such be the case, the Greek language—dating only from the time of Homer (and even then it was a copious tongue)—has lasted some two thousand six hundred years. All the languages of the world have been reckoned by some at four thousand, and by other at six thousand, but it is certain the real number is unknown. As a general rule, languages are numerous in proportion as men are barbarous. As we advance in society they become fewer. This last is the result of the amalgamation of several tongues, and the disappearance of others. There are more languages in Africa and in America than in Continental Asia; and probably as many in Australia, with its handful of Aborigines, as in Europe. In Mexico, the most civilized part of America, and where as far as regards that continent, they are consequently the fewest, there are still twenty native languages. Java, with twelve millions of inhabitants, has but two languages; while in rude and barbarous Borneo, with probably not a tithe of its population, fifty have been counted. He quoted these examples to show that the origin and history of language are a very different thing from what certain learned philologists have imagined

it. The only other portion of the work of Sir Charles Lyell on which he ventured to offer an opinion is that in which he compares man with the apes, placing them anatomically and physiologically in the same category. To begin with the brain. Even if there were no material structural difference between the brain of man and that of the most man-like ape, what would be the practical value of the resemblance, when the working of the two brains is of a nature so utterly different? The brains of the dog and elephant bear no resemblance to the brain of man or ape, or even to those of each other; yet the dog and elephant are equal, if not indeed superior, in sagacity to the most man-like ape. The brain of the wolf is anatomically the same with that of the dog, but what a vast difference in the working of the two brains! The wolf is an hereditarily untameable, rapacious glutton; the dog has been the friend, companion, and protector of man from the earliest period of history. The common hog is an animal of great intelligence, and wants only a pair of hands like the ape's to enable him to make an equal if not a superior display of it to that of the most anthropoid monkey. The sheep and goat have brains not distinguishable; yet the goat is a very clever animal, and the sheep a very stupid one. Is it not, Mr. Crawfurd asked, from all this an unavoidable conclusion, that between the brain of man and that of the lower animals, and between the brains of the lower animals among themselves, there exist subtle differences which the most skilful anatomy has not detected, and most probably never will detect? In the dentition of man and the ape there is certainly a singular accord. In the old-world apes, the number, form, and arrangement of the teeth are the same; the American monkeys, however, have four additional teeth, or thirty-six instead of thirty-two. The digestive organs also agree. Yet with this similarity man is omnivorous, and the monkey a frugivorous animal, seemingly resorting to worms and insects only from necessity. The teeth of the monkeys are more powerful, proportionably, than those of man, to enable them to crush the hard-rinded fruits by which they mainly subsist, as well as to serve as weapons of defence, for they have no other. Notwithstanding his seemingly dexterous hands, the monkey can neither fashion nor use an implement or weapon. It is his brain, anatomically so like that of man, but psychologically so unlike, that hinders him from performing this seemingly simple achievement. While the similitudes of the monkeys to man are stated, it might be well to state also the dissimilitudes. In the relation of the sexes the monkeys are sheer brute beasts. All the different races of man intermix to the production of fertile offspring. No intercourse at all takes place between the different species of monkeys. Man, of one variety or another, exists and multiplies in every climate; for there is hardly a country capable of affording him the means of subsistence in which he is not found. The monkeys are chiefly found within the tropics, and seldom above a few degrees beyond them. In adaptation to the vicissitudes of climate, the monkey is not only below man, but below the dog, the hog, the ox, and the horse, for all those thrive from the equator up to the sixtieth degree of latitude. The natural abode of man is the level earth—that of the

monkeys the forest. If there were no forests there would be no monkeys; their whole frame is calculated for this mode of life. Man came into the world naked and houseless, and had to provide himself with clothing and dwelling by the exercise of superior brain and hands. The monkeys are furnished by nature with a clothing like the rest of the lower animals, and their dwellings are not superior to those of the wild boar, nor for a moment comparable to those of the beaver. All the races of man, however low their condition, have been immemorially in a state of domestication; but the monkeys of every species are as incapable of domestication as the wolf, the polar bear, or the tiger. Man has the faculty of storing knowledge for his own use and that of all future generations; in this respect every generation of monkeys resembles that which has preceded it, and so, most probably has it been from the first creation of the family. The special prerogative of man is language; and no race of man, however meanly endowed, has ever been found that had not the capacity of framing one. In this matter the monkey is hardly on a level with the parrot or the magpie. It is not true that the anthropoid apes come nearest to man in intelligence. They ought to do so, if they be the nearest to man in the progress of transmutation by natural selection. Professor Huxley has fully and faithfully described four of these anthropoids; and it appears that, among them, those which anatomically approach the nearest to man are the stupidest. If, adopting the theory of the transmutation of species by natural selection, and we believe the gorilla to be the next step to man in the progress of change, it must be taken for granted that the transmutation must have proceeded from the lower to the higher monkeys. Exclusive of the lemurs, there are some two hundred distinct species. Which species is at the bottom of the long scale implied by this number? and has any naturalist ever ventured to describe the long gradation from it till we reach the gorilla? How are the tailed and the tailless monkeys to be classed, and how are we to place the monkeys of the new world, with their four supernumerary teeth? As to the wide unbridged gulf which divides man from the gorilla, no one has more fully admitted it, and so eloquently described it, as Professor Huxley, himself an advocate of the Darwinian theory. The monkeys, then, have an outward and even a structural resemblance to man beyond all other animals, and that is all; but why nature has bestowed upon them this similarity is a mystery beyond our understanding.

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## FALCONER ON THE REPUTED FOSSIL MAN OF ABBEVILLE.

SIR,—The asserted discovery of a fossil human jaw at Abbeville has already been noticed in *The Times*; it has been the subject of a communication to the Royal Society, and at the present moment it is exciting the most lively interest in the scientific circles of both England and France. Having passed a couple of days at Abbeville with M. Boucher de Perthes closely examining all the circumstances of the case, and having been entrusted by him with some of the specimens, which I have now by me here, I am in a position to throw some light on the subject. The case, as a whole, presents one of the most subtle instances of perplexed evidence on a point of science that has come under my experience, and is well worthy of a hearing from the lesson of caution which it inculcates.

Fashioned flint weapons, unquestionably of very remote antiquity, and as certain proofs of human agency as the watch in the illustration of Paley, have turned up in surprising abundance in the old gravel beds of Amiens and Abbeville, but hitherto not a vestige of the bones of the men who shaped them into form. Why it should be so has remained a mystery; for human bones are as enduring as those of deer, horse, sheep, or oxen, and fossil bones of extinct animals are not unfrequent in the Somme Valley deposits. At last it was thought that the objects so long sought for in vain had been discovered. To pass over minor incidents, on the 28th of March, M. de Perthes was summoned to the gravel-pit of Moulin-Quignon (described by Mr. Prestwich in his memoir in the *Philosophical Transactions*) to examine, *in situ*, what appeared to be a portion of bone projecting from the cliff of the section, close to its base—(*L'Abbevillois*, Avril 9). The specimen was carefully detached with his own hands by M. de Perthes, and proved to be the entire half of an adult human lower jaw, quite perfect, and containing one back tooth—namely, penultimate, or last but one. The sockets of the other teeth were all present, and filled with matrix, with the exception of the antepenultimate, the socket of which was effaced, the tooth having been lost during life. The solitary molar present was hollow from caries, and crammed with matrix.

The deposit from which the jaw was extracted is the "black seam flinty gravel," so called from its intensely dark (blueish-black) colour, arising from oxides of iron and manganese. It rests immediately upon the chalk, and belongs to what Prestwich calls the "high level" series, being the oldest of the Somme Valley beds. A thin cake of black mangano-ferruginous clayey matter is interposed between the chalk and the gravel. If the jaw proved to be authentic, and came out of the alleged position, it indicated man, by an actual bone, at a period of extremely remote antiquity. The appearance of the jaw was entirely in keeping with the matrix—*i. e.*, dark coloured and fairly covered with a layer of it. A single detached human molar was found at the same time, corresponding exactly in appearance and matrix; and, to complete the case, a flint hatchet, covered with black matrix, was extracted from the same spot by M. Oswald Dimpre, who ac-

accompanied M. de Perthes. These details are all given in the *Abbeville* of the 9th inst.

Two practised experts, Mr. John Evans and Mr. Prestwich, preceded me on the 11th inst. to Abbeville, and their suspicions were instantly aroused. They pronounced the flint hatchets to be modern fabrications. I followed on the 14th, and got three of them out of the "black seam gravel," covered with matrix, and having every external appearance of reliability; but, on severely testing them on my return to London, they all proved to be spurious. M. Quatrefages, member of the Institute, and the eminent professor of Anthropology in the Jardin des Plantes, got two of them in my presence from the same spot on the 15th inst. What they have proved to be I know not as yet, but I anticipate the same results. The number which turned out was marvellous, but the *terrassiers* were handsomely paid for their findings, and the crop of flint-hatchets became in like degree luxuriant.

Now for the jaw itself. What complexion of intrinsic evidence did it yield? The craniological materials available at Abbeville for comparison were, of course, very limited; but the specimen presented a series of peculiarities which are rarely seen *in conjunction* in the jaws of European races, ancient or recent. Here I must be a little technical. 1. The posterior margin of the ascending ramus was extremely reclinate, so as to form a very obtuse angle with the ascending ramus. 2. The ascending ramus was unusually low and broad. 3. The sigmoid notch, instead of yielding an outline somewhat like a semicircle, was broad, shallow, and crescentiform. 4. The condyle was unusually globular; and, 5, what was most remarkable of all, the posterior angle presented what I may venture to call a *marsupial* amount of inversion. The first three characters suggested to M. Quatrefages—if I may venture to cite him for a preliminary impression and not a judgment—the recollection of something corresponding in the jaws of Esquimaux, while the fifth character suggested to me the recollection of what I had seen in the jaw of an Australian savage. Neither of us had at hand the materials requisite for a satisfactory comparison, but the combination of characters above alluded to struck us both as sufficiently remarkable to demand serious examination. M. Quatrefages departed for Paris, taking the jaw with him, while I returned to London, bringing drawings and a careful description with measurements of the principal specimen, and M. de Perthes confided to me the detached molar. I may add that the jaw specimen, although professing to have been yielded from below a heavy load of coarse flints, presented no appearance of having been crushed or rolled; and that, making allowance for the crust of matrix enveloping it, the bone was light, and not infiltrated with metallic matter. The condyle washed yielded a dirty white colour.

As to the result, I have as yet no authentic information of the final conclusions which have been arrived at in Paris. My friends, Mr. Busk, F.R.S., and Mr. Tomes, F.R.S., both practised anthropologists, gave me their assistance in my part of the inquiry. The former, like M. Quatrefages and myself, was struck with the odd conjunction of unusual characters presented by the jaw, and speedily produced a lower jaw of the Australian type, brought by Professor Huxley

from Darnley Island, which yielded the same kind of *marsupial* inversion, so to speak, with a nearly corresponding form in the reclinate posterior margin, ascending ramus, and sigmoid notch. But Mr. Tomes's abundant collection brought the matter speedily to a point. From the pick of a sackful of human lower jaws, yielded by an old London churchyard, he produced a certain number which severally furnished all the peculiarities of the Abbeville specimen, *marsupial* inversion inclusive, although not one of them showed them all in conjunction. We then proceeded to saw up the detached molar found at Moulin-Quignon. It proved to be *quite* recent; the section was white, glistening, full of gelatine, and fresh looking. There was an end to the case. First, the flint hatchets were pronounced by highly competent experts (Evans and Prestwich) to be spurious; secondly, the reputed fossil molar was proved to be recent; thirdly, the reputed fossil jaw showed no character different from those that may be met with in the contents of a London churchyard. The inference which I draw from these facts is that a very clever imposition has been practised by the *terrassiers* of the Abbeville gravel pits—so cunningly clever that it could not have been surpassed by a committee of anthropologists enacting a practical joke. The selection of the specimen was probably accidental; but it is not a little singular that a jaw combining so many peculiarities should have been hit upon by uninstructed workmen.

The break down in this spurious case in no wise affects the value of the real evidence, now well established, but it inculcates a grave lesson of caution.

H. FALCONER, M.D., F.R.S.

(From *The Times* of the 25th April.)

### Miscellanea Anthropologica.

*Blätter für Gerichtliche Anthropologie*, vol. vi, 1856 (Journal of Forensic Anthropology), vol. vi, 1856. On Subjective Light, in relation to Forensic Anthropology.

SEILER (*Nenke's Zeitschrift*, 1839) relates the case of a clergyman who was attacked by two robbers in a pitch-dark night. A severe blow on the right eye caused such an evolution of subjective light, that he was able to recognize one of his assailants.

The question is of some importance in medical jurisprudence, namely, whether the sparks or rays of light, the usual results of pressure on the optic nerve, may, in some particular cases, enable a person clearly to perceive external objects in complete darkness, a question on which physiologists are by no means agreed.

Krügelstein (*Nenke, Zeits.*, 1845) cites a case in which a witness said, "I saw sparks fly from his eye" (the assaulted); here it was an objective light, as a third person saw the evolution of light.

It is related of Tiberius and Cardanus that they could read in the dark immediately on awakening. (Suetonius, *Vit. Tib.*, cap. 68; Plinius, *Hist. Nat.*, lib. xi, cap. 37; Cardanus, *De Subtilitate*, lib. xii.)

Lanzius knew a young man who could see and read in the greatest darkness.

Cumenius (*Miscell. et Ephem. Nat. Cur.*, dec. 1, a. 8, obs. 38) quotes the following case. A young man, a musician, received a blow on the right eye from the breaking of a string, which caused him much pain. In the following night, when he woke, his room was brilliantly lighted up, so that he could perceive the minutest designs on the papered walls. But when he closed the right eye he was in complete darkness. On again opening the right eye, all was light.

Feuerbach tells the same thing of Casper Nause.

Dr. Michaelis, of Leipzig (*Schlichtegroll, Nekrolog der Deutschen*), iii b., p. 337), could, during the last few years of his life, at intervals read in the dark. Kastner (in his *Archiv für die Gesamt. Natur.*, bd. i, p. 68) says that he could spontaneously produce in himself such an electric light, and that on one occasion, after a botanical excursion, he read before his pupils, in perfect darkness, several passages from Hoffmann's *Florer*. Siebentaar (*Handb. de Ger. Med.*, ii, 531) says that he succeeded, by friction and pressure, to produce sufficient light to see for moments the banisters of his stairs in the darkness. From these and similar cases it follows: 1. The human eye possesses the power of evolving sufficient light to enable a person to perceive objects in darkness; 2. That, in medical jurisprudence, the assertion of an individual (such as that of the clergyman) to have seen the assailant is not to be rejected.

*Superfætation.* *Southern Medical and Surgical Journal*, 1854, reported by Attaway.

On the 16th of June, 1854, a white woman was delivered of two children. The first was of dark complexion, and presented all the characters of African origin. Not being suspicious of the mother, I was at first inclined to look upon it as an abnormal pigment, or as a case of cyanosis. An hour after a second child was born, with a white complexion, blue eyes, and smooth hair. The contrast was striking. On looking close at the first child I found that the African type was perfect, and so was the Caucasian type of the second child. Subsequently the woman confessed as follows. Five days before her last menstruation she had intercourse with a white man, who was the father of the white child. Three days after (eight days after) she yielded to a negro, who was the father of the second child. She assured me that this was the only coition which had taken between her and the negro. A mare, having been first covered by an ass, and a fortnight after by a stallion, produced in due time a horse filly, and ten minutes after a mule. (*Constatt Jahresbericht*, 1859, from a report by Chabaud in *Repert. de Toulouse*.)

*On the Influence of the Climate of North America on the Physical and Psychical Constitution.* By E. DESOR. (*Centralblatt für Naturgeschichte und Anthropologie*, 1853.)

WHEN a German or Swiss emigrant arrives in New York, the climate appears to him much the same as that of his native country. But if he takes up his residence in that county, he soon finds it necessary to change his mode of life and habits.

It is about two hundred and thirty years since the first colonists arrived in New England. They were all true Englishmen, endowed with all the characters of the Anglo-Saxon race.

Another chief characteristic of the American is the length of the neck; not that it is absolutely longer than amongst us, but appears longer on account of leanness. The Americans again soon recognize the European by the opposite characters. "He is a stranger, look at his neck, an American has no such neck."

The physical difference between the American and European is not only manifest in the muscular system, but also in the glandular system, which especially deserves the attention of the physiologist, as it concerns the future of the American race.

The most intelligent Americans clearly perceive that the increasing delicacy of form (specially in the women) ought, if possible, to be arrested. Despite of their instinctive aversion against the Irish (forming the largest contingent of immigrants), they are aware that the development of the glandular system of that race is well calculated to neutralize the influences of the climate for a considerable time. It has been observed that the finest women are descended from European parents.

The influence of the climate is not merely shown in the descendants, but in the parents. There are few Europeans who get fat in the United States; the Americans, on the contrary, who reside for a considerable time in Europe, become more healthy and portly. This occurs also to the European who, after a lengthened stay in America, returns to Europe. The author (Desor) quotes himself an example of the kind. What still more characterizes the North American is his stiff lank hair. There is a striking contrast in this respect between the Englishman and the American. We look in vain among American children, despite of all the care taken by their mothers, for curly-headed children, so frequently seen in England.

This influence on the hair is probably owing to the dryness of the climate. Hair, as is well known, curls when moist; we are, therefore, not surprised that in England the hair is inclined to curl, whilst it remains lank in America. The hair of the European becomes in America drier, and requires pomatum, etc., to keep it glossy and soft. Hence also there is a very large number of hairdressers in America. (M. Ausland, 1853.) Mention is also made of the want of metal in the voice of Americans, which is also ascribed to the influence of climate.

Every European who arrives at New York, Boston, or Baltimore, will also be struck with that feverish activity the American displays. Everyone is in a hurry; the people don't walk, they run. Something like it is, no doubt, seen in the large commercial towns of England; but the activity of the Englishmen seems more under the control of reason; that of the Yankee is instinctive, at any rate the result of habit, or of an innate restlessness. They even exhibit this accelerated activity during their meals, which, even if they have nothing important to do, are despatched in less than no time.

The author is also of opinion that the use of spirituous liquors is more destructive in the American than in our climate. Europeans who, like the English, are accustomed to strong drinks in their own country, must either renounce the use or limit the quantity of these liquors in America, or they will suffer from them. Hence the large number of temperance societies in America.

At this time the pure English breed is no longer seen among the inhabitants of the United States. A Yankee type has been developed. This type is not the product of intermixture, since it is seen in the most marked form in the Eastern States, where the race is least mixed. External influences must therefore have produced the type. One of the first physiological characters of this American type is an absence of corpulence. On travelling the streets of New York, Boston, Philadelphia, etc., you will, among one hundred persons, scarcely see a portly one, who, moreover, will frequently be found to be a foreigner.

*Abolition of Slavery.*—The following remarks are forwarded to us by a correspondent, who states that it is a *verbatim* report of a speech delivered at a meeting of a young men's debating society in October last, to advocate the abolition of slavery. We rely fully on the veracity of our correspondent, and give insertion to such a curious *morceau*, which, we fear, but too truthfully exhibits the ignorance which exists in this country respecting negro slavery.

"Mr. Chairman, the proof which I wish to prove this evening is, that it will be for the universal good that the Southern or Free States should conquer the Northern or Slaveholding States; for slavery, to all honest hearts and Christian men, must be an abomination; but above all other Slaveholding States, the Northern States of America have been held up to the execration of the world for their abominable conduct towards, and their atrocities committed on, the wretched Hindoos whom they have so villanously enslaved. But we hope now that retribution is at hand, and the brave Southern general M'Clellan, who is now at the doors of New York clamouring for admittance, and his coadjutor, President Jefferson Davis, will soon burst the bonds that have so long ground down the unfortunate Brahmins, and bound them in chains and fetters in New York dark dungeons and in the "dismal swamps" of Toronto, and restore these unfortunate members of society to that pre-eminence in the social scale of humanity that they have so long been deserving of. Their social life, and the high cultivation that those highly gifted members of the human race have attained to, is too well known to need any further argument upon it. Then, when at length New York and Montreal have yielded to M'Clellan, the commerce of the New World will again be open to the Old, then Europe once more will be able to export cotton to America, and America in turn will be able to export to Europe, wine, frankincense, and myrrh!"

At a recent sitting of the Académie des Sciences, a communication was received from M. de Vibraye on flint implements. He stated that the country round Amiens and Abbeville is not the only part of France where flint hatchets are found; that he had for the last five years been exploring various parts along the banks of the Loire, and had found upwards of a thousand specimens pertaining to the stone period, in about a dozen localities, and that during the last year the department of Loire et Cher had begun to be explored with similar results.

**REPORTS OF THE  
MEETINGS OF THE ANTHROPOLOGICAL SOCIETY.**

**ORDINARY MEETING, FEBRUARY 24TH, 1863.**

**THE PRESIDENT** read the inaugural address on the Study of Anthropology (see p. 1).

A vote of thanks to the President for his address was proposed by **Mr. BURKE**, seconded by **Mr. BLACKSTONE**, and carried unanimously.

**THE PRESIDENT**, having intimated that he should be happy to hear any remarks any gentleman might have to offer on the topics touched on in the address,

**Mr. C. H. CHAMBERS** inquired whether the Society had opened any relations with similar societies on the continent.

**THE PRESIDENT** replied that the subject was under the consideration of the Council, and that a correspondence was at present being carried on with the Anthropological Society of Paris with a view to a mutual exchange of publications.

**Mr. C. C. BLAKE**, Honorary Secretary, drew attention to a most important duty which the Society will be called upon to perform, namely, the appointment of various committees to investigate and report upon special subjects. The principal topics which will be brought before the committees will be the following.

The geographical distribution of man, and the geographical relation of races one to another. The question of acclimatization, which though ably treated of in the President's paper read before the British Association in 1861, still requires much further investigation. The vertical distribution of man, and the influence of great altitudes on certain organs, the respiratory organs, for example. Geological distribution and the nature of the evidences of the antiquity of man, subjects of extraordinary interest, and to the investigation of which a peculiar responsibility is attached. The assistance of the geologist and palæontologist will be required to tell us the number of species of animals found in connection with human remains, and it will be the duty of the Society to prepare a series of tables illustrating this subject. The archaeological aspect of man as far as regards the works of art of past ages, as well as of existing nations. Early traditions. As an illustration of the light which zoology may throw on the study of mythi, the suggestion was thrown out that the reason why the inhabitants of Borneo think that man was made from the dust, and the Thibetans that he is descended from the monkeys, is that the Borneans are familiar with large anthropoid apes, and are by no means desirous of claiming descent from such ill-looking creatures, whereas in Thibet monkeys are rare and confined to the smaller species, so that the people have no aversion to thinking themselves allied to them. The migrations of man, chiefly as illustrated by philology. The resem-

blances alleged by Max Müller and others to exist between the languages of widely separated races will be specially taken into consideration. The geographical distribution of disease, and the causes of their appearance and disappearance, branches of anthropology in which the co-operation of the medical members of the Society will be required. The abnormalities of the skeleton, with special reference to the question whether they are more usual in certain races. The subject of the dental varieties of man will early be brought to the notice of the Society. The cerebral organization of man and its relation to inferior types, a subject which it is hoped will be studied with the earnestness and honesty of purpose which it demands, and not with the levity which has lately characterized discussions on it. The structures which man shares in common with other animals; without any reference to the hypothesis of transmutation. Hybridity between so-called races of mankind, and the question whether hybrid races die out, or are physically inferior to others surrounding them. The distribution of human parasites, a subject which seems to throw light on many problems of anthropology, and from the study of which very interesting results may be expected. The historical evidence of the extinction of races. Differences of colour, on which every ethnologist has written, but respecting which our knowledge still rests on very uncertain information. The stature of man. In a recent paper contributed to the Anthropological Society of Paris, it is stated that dwarfs are unknown among negroes. The relative degree of the complexity of the organs of sense; whether, for example, the North American Indians are really endowed with any special sense of smell, or the Negroes with a higher standard of eyesight than ourselves. Mr. BLAKE concluded by remarking on the immense field for research afforded by the science of anthropology, and how little the wide scope of that science and its subordination to the great science of biology have hitherto been appreciated.

Mr. L. BURKE took exception to the stress laid by the President on the collecting of facts, and maintained that a large mass of facts had already been ascertained, from which it would be the duty of the Society to deduce general laws. He also expressed his dissent from the views of the President respecting the untrustworthiness of books of travel.

Mr. S. J. MACKIE, F.G.S., referred to the relations between geology and anthropology, and urged the necessity of carefully tracing the records of man's existence through successive geologic ages.

Mr. J. G. AVERY commended the fairness and moderation of those parts of the President's address touching on matters connected with theology, and expressed his satisfaction at knowing that the objects of the Society were in no way antagonistic to revelation.

Dr. G. D. GIBB, F.G.S., as a medical man, promised his aid in the investigation of the subject of the distribution of disease.

Mr. J. F. COLLINGWOOD, F.G.S., proposed that the President's address be reprinted separately and circulated.

Mr. T. S. PRIDEAUX seconded the proposal, which was carried unanimously.

The **PRESIDENT** thanked the meeting, briefly replied to Mr. Burke and to a question asked by Mr. Bouverie Pusey; and, in conclusion, referred to what had fallen from Mr. Avery, and stated that the Society was not antagonistic to anything at all, but had purely for its object the investigation of truth.

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MEETING OF THE 24TH MARCH, 1863.

**SIR CHARLES NICHOLSON, BART., VICE-PRESIDENT, IN THE CHAIR.**

**THE HON. SECRETARY, Mr. C. C. BLAKE**, read a paper by Captain **R. F. BURTON, Vice-President of the Society**, on "A Day among the Fans." (See p. 43).

**Sir CHARLES NICHOLSON** proposed a vote of thanks to Captain Burton.

**Dr. HUNT** drew attention to the reliability of Captain Burton's observations, and to the importance in matters of science of having observers free from preconceived notions. Although the dying out of solitary races is an undoubted fact, we know that races hardly ever die out in their own country; but, when removed from their native place, they degenerate and become extinct, and that independently of drinking and the various other injurious consequences of intercourse with civilized man. A short period of time may make a marked difference with regard to cannibalism among such a people as the Fans; and one man may observe the habit, while another, coming twelve months afterwards, may find no trace of it. **Dr. Knox** and others have denied the existence of cannibalism; but, independently of the fact that **Capt. Burton** states that he has seen all but the act of eating, we have credible records of the practice from the sixth century to our own times.

**Mr. C. C. BLAKE** remarked that **Capt. Burton's** paper was one of considerable interest to the zoologist, and chiefly because it disproved the alleged correspondence between the distribution of the lowest races of mankind, and that of the anthropomorphous apes. The Fans, inhabiting the same district as the gorilla, are found to possess a self-acquired civilization far superior to that of the southern and coast tribes, who have been long in contact with the white man. It is commonly stated that no men are cannibals unless animal food is extremely scarce; but the Fans are, we are told, amply provided with several descriptions of animal food, and are yet decided man-eaters.

**Mr. A. A. FRASER** narrated an instance of cannibalism which came under his own observation in the Fiji Islands. Going up the Rewa river in 1853, he saw the body of a man who had been killed, surrounded by a great number of natives: and, when he returned, he saw the people scraping the dark skin off the dismembered limbs of the corpse with shells. The smell of roasting human flesh was so repulsive as to make many of **Mr. Fraser's** boat's crew sick.

**Mr. BURKE** thought that the conflicting opinions on extinction of races might easily be reconciled. There is no doubt that solitary

tribes die out, and also races in a certain sense; but the homes or centres of formation of races are, Mr. Burke asserts, maintained.

Mr. E. B. TYLOR said that there is often great difficulty in finding out whether people are cannibals. On the Brass river, within reach of British guns, Mr. Hutchinson and some friends were witnesses of the devouring of a criminal by the friends of the man whom he had aggrieved, although the practice was not previously known to exist in the district. Mr. Tylor also noticed the resemblance between the musical instruments of the Fans and those of the Aztecs and South Americans, and thought that the marimba was imported by the negro into America.

Professor TAGORE stated that the aborigines of India were cannibals, and that the eating of human flesh was a religious ceremony among the present Hindus. The eating of horse flesh as an ordinary article of food was in early ages common in India, but was afterwards elevated into a religious ceremony.

Sir CHARLES NICHOLSON thought it marvellous how people can doubt the existence of cannibalism. He had conversed with many persons who had seen it, and might himself have seen it if he had wished. It appeared generally to be a quasi-religious ceremony. With regard to the extinction of races, Sir Charles Nicholson remarked that the New Zealanders are evidently dying out. War alone was not sufficient to account for the extinction of races; the causes are rather physiological. Among races that are disappearing the men are commonly more numerous than the women, of course causing prostitution and its consequent infertility. Sir Charles thought there was good evidence of the general diffusion in early times, throughout the whole of the southern hemisphere at least, of an ancient negroid race; and that if we ever find a fossil man, he will probably be of that type.

Mr. BOLLAERT mentioned a case of a number of negroes being kidnapped and carried to Easter Island, where they rapidly died out of dysentery and measles.

Mr. BOLLAERT read a paper by Professor RAIMONDI on "The Indian Tribes of Loreto, Northern Peru." (See p. 33).

A vote of thanks was proposed by the Chairman.

Mr. C. C. BLAKE did not understand how a board with a hole in it, fastened into the forehead of an infant in the manner described by Professor Raimondi, could cause a circular elevation of the frontal bone.

Mr. BOLLAERT suggested that the soft parts might protrude.

Dr. DRACHAICHIS was of opinion that the board would be quite capable of producing the effects ascribed to it.

Dr. HUNT regretted the vagueness of Professor Raimondi's statistics, more especially as we have no other information about these tribes of Loreto. He thought the principle of creating necessities one of great importance in dealing with primitive races, and well worthy of the support of the Society.

Sir CHARLES NICHOLSON. It is to be regretted that we have no information on the subject of the language of these people, the rela-

tions of languages being of the highest importance in determining the relations of tribes.

The meeting was then adjourned.

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MEETING OF THE 7TH OF APRIL, 1863.

DR. HUNT, PRESIDENT, IN THE CHAIR.

The Honorary Secretary having announced the presents to the Society,

Professor OWEN made some remarks on some human bones discovered under six feet of brick earth at Chatham, and which have been presented to the Society by the Rev. H. F. Rivers. Professor Owen remarked that the bones contain much gelatine, and are therefore probably not contemporaneous with the brick earth in which they are found. The teeth are of the ordinary European type, and so much worn as to be probably characteristic of coarse food. The forehead is low, but whether very unusually low it would be impossible to say until the fragments of the cranium are put together. From the size and strength of development of the ridges for the attachment of muscles the bones appear to be those of a male.

Mr. MACKIE asked whether there was any trace of disturbance of the brick-earth in which the bones were found, and whether any marsh shells were discovered in the brick-earth. The frontal bone appeared to be like that of the Heathery Burn Cave skull.

The PRESIDENT. Further information as to the finding of the bones will be laid before the Society at some future time; but I may state that a stone implement, weighing about fourteen pounds, was found with the remains.

The HONORARY SECRETARY read a paper by Mr. R. T. GORE on "The Microcephalic Brain of a Female Idiot." (See p. 168).

A vote of thanks having been passed, Professor OWEN said:—

The normal organization of the human species is liable, and perhaps more so than that of lower species, to malformation as a consequence of arrest of development; and this is especially the case with the organ the great relative size and complexity of which form the chief characteristic of the human organization, viz., the brain. Instances of this arrest of development are known in different varieties of the human kind, *e. g.*, in the Negro one, as exemplified by the female called by her showman the "Hottentot Venus"; and by the hybrid Spanish and Indian children from San Salvador, called by their showman "Aztecs". But the best recorded cases of such cerebral arrests are those of Europeans, as exemplified by the idiot whose brain is preserved in St. Bartholomew's Hospital; by that whose brain, weighing 1 lb. 4½ oz., is described by Dr. Todd (*Cycl. of Anat.*, vol. iii, art. "Nervous Centres"); and by the still smaller and more remarkable instance of the idiot with the brain weighing only 10 oz. 5 grains, avoid., described this evening by Mr. Gore. No physiological phenomena are of greater interest and importance than those

which tend to directly elucidate the relations of the cerebral organ to the mental phenomena in mankind. Such elucidation is given by these cases of variety, in which the brain and cranium fail to be developed to their normal proportional size: and the one which Mr. Gore has communicated to us is, so far as my research has extended, the smallest instance of a brain, otherwise of sound structure, with which the individual has lived in health beyond maturity to middle age. I would first remark that the brain so arrested in development does not offer a close resemblance to, or correspondence with, that of the chimpanzee, orang, or lower forms. It is, at best, only a general resemblance; such, *e. g.*, as may be due to the arrest of the backward growth of the cerebral hemispheres, falling short of, or not extending beyond, the cerebellum, with the concomitant low development of the included structures, indicated in Dr. Todd's description, in which he remarks, "there could scarcely be said to be any trace of the hippocampus minor." (*Cycl. of Anat.*, vol. iii, p. 719.) The late Dr. Todd has recorded the chief characters of an adult idiot's brain, which he examined in 1844, and which he regarded "as an example of the class of changes which take place in the brains of most idiots." (Art. "Nervous System," *Abnormal Anatomy, Cyclopaedia of Anatomy and Physiology* vol. iii, p. 719.) The weight of the brain was 1 lb. 4½ oz., avoirdupois, "after having lain in spirits for some days. The upper surface of both hemispheres 'was perfectly smooth'; the convolutions were not (there) developed. The Sylvian fissure was well marked": at its posterior extremity there was a slight puckering, indicating a feeble development of the "insula of Reil." A few fissures and imperfectly developed convolutions were found upon the inferior surface of the middle lobe, and upon the lateral and inferior surfaces of the anterior lobe. The corpora mammillaria appeared to be fused together. "The corpus striatum was exceedingly small."—"The hippocampus major was very small;" and there could scarcely be said to be any trace of the hippocampus minor. "The lateral ventricles were large and rather dilated. The fornix was well developed, as was also the corpus callosum."—"The cerebellum was well developed." The pineal gland was large. Sometimes, as in this case, the fetal condition of non-convolution of the surface of the hemispheres persists; more commonly there are convulsions corresponding in size and depth with the normal human ones, but fewer in number, as in the 'St. Bartholomew's brain,' and in that described by Mr. Gore. But all these cases exemplify the principle that the specific character marks the embryo as essentially as the adult, that the embryo does not pass through lower forms of animals. Just as the toes, as soon as they appear in the human embryo characterize the foot, whilst they bud forth, in the ape, in the direction to form the lower hand. We know that the individual idiots supplying the examples described by Dr. Todd, Mr. Gore and myself (in the St. Bartholomew's case) were the abnormal offspring of parents with the proper human brain, of the average weight. Had any of these perished in a cavern at times when idiots were less cared for than at present, the skull, falling into the hands of the Trans-

mutationist, might have been described, and exhibited at the Royal Institution, as that of the 'missing link;' the idiot 'Aztec' children were two of a family of six, with normal brains, and the parents exhibited no departure from the ordinary size of cranium and capacity of mind. In the absence of special information, and the presence of skulls of Bosjesmen, Hottentots and Negros, corroborating Tiedemann's and Peacock's evidence of the normal size and weight of the brain in those families of the human race, it is to be inferred, or held to be more probable, that the Hottentot Venus was a case of 'arrest of development,' rather than as manifesting the normal character of a lower race linking on the Ape to Man. It is instructive to notice the close analogy of the psychical phenomena in these cases of arrest of development. The 'Aztecs' showed lively but abrupt movements, without obvious aim; the features showed movements devoid of intelligible expression, but with the general actions indicative of internal pleasure or gaiety. When I visited the children in their beds early in the morning, a week after my first inspection of them, they recognized me; I had examined their teeth in the first instance, and the boy pulled down his lip to show them to me, on the second visit. I do not feel justified, however, from this evidence of their recalling an individual to mind, in ascribing to them a good memory. They were fond of beating a little drum and jingling a tambourine. They spoke a few words of English and more of Spanish, but seemed incapable of framing a definite proposition; they were pleased with, and attracted by, any bright object or toy. They had no sense or instinct of shame. The size of the cranium in the female indicated a brain arrested at the stage of that of the Hottentot Venus, figured by M. Gratiolet. The Aztecs were stupidly docile; doing what they were bidden, but not in an intelligent way. Mr. Gore states, in reference to the woman with the still smaller brain, 'Her manners were exactly those of a very young child. She could say a few words, and was obedient and affectionate to those about her.' If one were to affirm of such a condition of mind that 'it was not idiotcy, not even imbecility,' such a statement would not justify the selection of any of those arrests of cerebral development as the figure by which the true relations of the highest form of brute brain and the lowest normal form of human brain would be illustrated: because, such statement does not truly illustrate the functional powers of the brain stopped short in its development; it merely enables the reader to form a fair judgment of the mental constitution of the propounder and adopter of such statement.

Mr. C. C. BLAKE. The case before us is the most striking case of microcephaly on record. The following are the general conclusions arrived at by Dr. Peacock from his investigations on the weight of the brain. "1. The weight of the brain in the adult male averages about forty-nine ounces avoirdupois, and ranges from about forty-two to nearly sixty ounces. In the adult female the weight of the brain averages about forty-three ounces and a half, and ranges from thirty-nine to nearly forty-seven ounces. The mean difference is therefore about five ounces and a quarter. In the previous series of observations, which greatly exceeded in number that now published, the male enceph-

phalon had an average of about fifty ounces; the female of nearly forty-five ounces, or a difference of nearly five ounces and a quarter; and the range was in both sexes more extensive. The average weight of the encephalon in these calculations corresponds, therefore, sufficiently with the previous results, as well as with those obtained by Dr. Reid, and does not differ greatly from the conclusions of Sir W. Hamilton, Dr. Sims, and Dr. Clendinning. The average weight of the brain, as deduced by these observers, ranges from forty-five ounces and three-quarters to fifty ounces and a quarter in males; and from forty-one ounces and a quarter to forty-five ounces in females. The observations of Portal, Tiedemann, M. Leliet, and M. Parchappe, are also similar." The largest brain described by Wagner in his *Vorstudien*, is that of a female, and weighed 1872 grammes; Cuvier's brain weighed 1861 grammes; Byron's, it is said, 1807 grammes, but probably more. The next in size is that of an insane male individual, and weighed 1783 grammes. The smallest healthy male brain on record weighed 1020, and the smallest healthy female 907 grammes. Thus we have both the greatest and smallest amount of brain in the female. Of idiots' brains, in Theile's case it was as low as 300 grammes, and in that preserved in St. Bartholomew's Hospital 322 grammes; but the brain described by Mr. Gore weighed only 283 grammes. Especially remarkable, in this last-mentioned brain, is the very small extent of cerebellum covered by the cerebrum. The cerebellum itself is also very small, and to this was probably due the tottering gait of the woman. Mr. Gore very properly declines to express any opinion on the correlation of the cerebral convolutions; a subject which, except by Gratiolet and Daresté, has hardly been treated so as to conduce to the progress to which we hope we are all tending. But this much is certain, that the external perpendicular fissure, so constant in the quadrumana, is not found in even the earliest-arrested idiot's brain with which we are acquainted.

Mr. ROBERT DUNN, F.R.C.S., said he had when a boy seen the Hottentot Venus, and certainly was not given to understand that her head was unusually small, or that she was deficient in intelligence.

Mr. C. C. BLAKE considered there was most powerful evidence of the idiocy of the Hottentot Venus. Her brain, after it had been some time preserved in spirits, was described by Gratiolet. A zoologist has lately argued, from the readiness with which the woman stripped herself, that she was sane; but surely no one else would consider this as an evidence of sanity.

Professor OWEN said he had seen the skeleton of this woman in the Paris Museum, and, having compared it with those of other Hottentots, was convinced of this being a case of arrested development.

Dr. DRACHAICHIS questioned whether a very small brain necessarily indicated insanity, as one of the largest brains on record was that of an insane person. He contended that want of use was the cause of arrest of development.

Professor OWEN had not before considered it necessary to draw the distinction between idiocy and insanity. Idiocy is the want of ability to originate or conceive of general propositions; but in insanity

general propositions are most readily produced, but are wrongly combined. Want of use is most certainly not the cause of arrest of brain-development. Brothers are the best instructors; and the Aztec children had such older than themselves and sane.

Mr. BURKE thought that the negro blood in the Aztec children might easily have been known by the curly hair; the type of features was somewhat Jewish. The liveliness of the children, inherited from their Indian forefathers, illustrated the rule that idiots manifest the characteristics of the race to which they belong.

Mr. BOLLAERT thought it very unlikely that there was any Jewish blood in these Aztecs; if they had come from New Granada, it might have been less improbable.

Dr. HUNT remarked on our ignorance of the causes and limits of reversion to an ancestral type psychologically, if not anatomically; and insisted on the great importance, in such cases as Mr. Gore's, of getting full information as to the parents and other relatives of idiots.

Mr. BURKE said we can limit the reversion to type, and that no one ever heard of any one case of reversion out of a race.

The DUKE OF ROUSSILLON mentioned a case of type of features being preserved for ten centuries in his own family; and also of certain towns in Italy where the inhabitants are decidedly of the Saxon type.

Mr. PRIDEAUX said, with regard to the Neanderthal cranium, a cast of which was exhibited, that he saw no evidence of idiocy in the shape of the skull, the capacity being apparently very considerable.

Mr. C. C. BLAKE considered the Neanderthal cranium too fragmentary to allow of any safe estimate of its capacity being given. There appeared to be a considerable resemblance between the occiput of that skull and that of the skull of the idiot whose brain Mr. Gore had described. The large size of the orbits of the latter skull is also remarkable.

The PRESIDENT adjourned the meeting.

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APRIL 21ST, 1863.

(The reports of this meeting will be inserted in the second number of the *Anthropological Review*.)

The HONORARY SECRETARY read the following extracts from a letter from M. Paul Broca, Secrétaire-général to the *Société d'Anthropologie de Paris*, addressed to Dr. James Hunt, President of the Anthropological Society of London.

"DEAR SIR,—A long time ago, I received the letter in which you announced to me the foundation of the Anthropological Society of London, to which I certainly should have replied at once, to express to you all the interest which I take in your work. . . . Such was, my dear colleague, the cause of the delay of my reply. But your letter, which I received this morning, has caused my regret that I did not

write to you sooner. Have the kindness to accept my apologies. You cannot doubt the satisfaction with which the Paris Society has learnt that you are about to found in London a society established on the same bases as our own, and which we shall consider as our sister-society. The Paris Society does not feel any doubt respecting the success of an undertaking directed by a man like yourself. At London, as at Paris, experience has demonstrated the insufficiency of the Ethnological societies. Ethnology is merely one of the branches of Anthropology. To give to the study of man all its development, to create a veritable science, it is necessary to regard it under every point of view, and bring to bear at the same time the resources of anatomy, physiology, hygiene, ethnology, philology, history, archæology, and palæontology. Since we founded at Paris a Society of Anthropology, we believe that we have been justified by experience, and that the necessity of comprehending all these studies under one head, to make them lead towards one object, will not long remain unrecognized. Already MM. Wagner and von Baer have organized in Germany *Anthropological Congresses* which will become periodical. The Anthropological Society of London will fulfil the same task; and we have the firmest hopes that, after the conclusion of the American crisis, the *savants* of the United States will in their turn experience the desire to organize a society of anthropology. . . . I am highly flattered that you should have considered that the translation of my *Mémoire sur l'Hybridité* may prove of service. In this respect, I give you the fullest powers. If you think it right that some passages should be abridged or suppressed, you can do so at your pleasure, and I shall remain at your service to correct the proofs. Thursday next, the committee propose to establish with your society a regular exchange of publications, and to give to this measure a retroactive application since the establishment of our society. With fresh expressions of my excuses, Agrééz, mon cher collègue, &c.

“ *Le Secrétaire-général, BROCA.* ”

“ To Dr. James Hunt, F.S.A.,  
President of the Anthropological Society of London.”

THE  
ANTHROPOLOGICAL REVIEW.

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AUGUST, 1863.

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ON THE SCIENCE OF LANGUAGE.\*

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IN the year 1861, Professor Max Müller, at the request of the Royal Institution of Great Britain, delivered a series of lectures on the Science of Language.† These lectures have since been brought out in a separate volume, with many learned notes and additions; which, in 1862, had reached a third edition. The work embraces nearly everything that could be treated of on the science of language; as the growth in contradistinction to the history of language; the empirical, theoretical, and classificatory stages; the genealogical and morphological classification of languages; comparative grammar; the constituent elements of language; and the origin of languages. These heads include phonetic decay, dialectic regeneration, a discourse on modern languages and dialects, demonstrative roots, the terminational stage, and the natural selection of roots. Although I feel quite unable to criticize, in the way that it deserves, any work from the pen of so distinguished a linguist as Professor Müller, I will nevertheless take the liberty of making a few remarks upon his arduous undertaking. Professor Müller says: "I had lived long enough in England to know that the peculiar difficulties arising from an imperfect knowledge of the language would be more than balanced by the forbearance of an English audience; and I had such perfect faith in my subject, that I thought it might be trusted even in the hands of a less skilful expositor." Any one who has carefully read through the work will doubtless be of opinion that Professor Müller had no need of any forbearance whatever;

\* The present article is based upon a paper read before the Anthropological Society of London, June 9th, 1863.

† Lectures on the Science of Language, delivered at the Royal Institution of Great Britain in April, May, and June, 1861, by Max Müller, M.A. London: 8vo, 3rd ed. Longman: 1862.

and that it would be quite as well if authors of the present age would take example from his simple and unaffected style.

Philologists have for a long time bewildered themselves and the rest of the world in their search after a primitive language; and the number of theories thereon, and on the origin and affinities of some of the principal languages, is somewhat amusing. Dr. Murray derives language from nine principal roots, viz., *ag, bag, cwag, dwag, mag, nag, rag, swag, tag*,\* a theory which I shall take the liberty of christening from the doctor's own roots, the *tag-rag* or *c(w)ag-mag* theory. Dr. Schmidt, in a homœopathical manner, derives all Greek words from the root *e*, and all Latin words from the arch-radical *hi*,† in which he and I do not agree.

Most Eastern writers give the preference in point of antiquity to the Syriac: Camden and many learned writers ascribe priority to the Chaldee. Dr. Webster says, "the descendants of Noah journeyed from the East, and settled in the plain of Shinar, or in Chaldea; that the language used at that time by the inhabitants of that plain must then have been the oldest or the primitive language of man; and this must have been the original Chaldee." The Jews contend that the Hebrew language was the most ancient; and with them many Christian writers agree, as Chrysostom, Augustin, Origen, Jerome, among the ancients; Bochart, Heidigger, Buxtorf, Selden, and Dr. Sharpe, among the moderns. Guichard‡ maintained that as Hebrew was written from right to left, and Greek from left to right, Greek words might be traced back to Hebrew by being simply read from right to left. Lord Monboddo says, "I have supposed that language could not be invented without supernatural assistance; and, accordingly, I have maintained that it was the invention of the dæmon kings of Egypt, who, being more than men, first taught themselves to articulate, and then taught others. But, even among them, I am persuaded there was a progress in the art, and that such a language as the Shanskrit was not at once invented."

The Arabs very reasonably dispute the priority of antiquity with the Hebrews; whilst the Armenians consider their language the most ancient, because the ark first rested in Armenia. Again, some authors maintain that the language spoken by Adam is lost, and that the Hebrew, Chaldee, and Arabic are only dialects of the original lan-

\* Cf. Max Müller, p. 343.

† Ibid., cf. Curtius, *Griechische Etymologie*.

‡ *L'Harmonie Etymologique des Langues Hébraïque, Chaldaïque, Syriaque, Grecque, Latin, Française, Italienne, Espagnole, Allemande, Flamende, Anglaise*, etc., par Estienne Guichard. Paris: 1806.

guage; and that Abraham spoke Chaldee before he passed the Euphrates, and that he first acquired a knowledge of Hebrew in the land of Canaan. According to Reading, the Abyssinian was the primitive language; Stiernhielm and Rudbeckius contend for Swedish; Verstegan, Junius, and Ray for Saxon; Skinner for Belgic and Teutonic; Lye for Icelandic; Salmasius, Boxhorn and Aurelius for Scythian; Hugo for Latin; Erixi for Greek: whilst others, with more love for their country than for truth, have traced Greek and Latin to German and Celtic. Indeed some have gone so far as to assert that Hebrew and its sister dialect, the Phœnician, are based upon Celtic. Court de Gébélin, in a work in nine quarto volumes,\* endeavours to derive Latin and French from a pretended primitive tongue. He considers speech as an instinct, and every language as a dialect of what he calls "primitive, inspired by God Himself, natural, necessary, universal, and imperishable." He treats Persian, Armenian, Malay, and Coptic as dialects of Hebrew; derives Latin from Celtic; and discovers Hebrew, Greek, English, and French words in the idioms of America. Herodotus† tells us, that in consequence of a dispute between the Egyptians and Phrygians concerning the antiquity of their respective languages, Psammetichus, king of Egypt, ordered two children to be brought up with a prohibition that no word should be pronounced in their presence, but that nature should be left to speak for herself; and that the first word they uttered was *βεκκον*, which in Phrygian signified "bread"; and that the Egyptians, convinced by this experiment, admitted that the Phrygians were more ancient than themselves. Again, a preference in point of antiquity has also been given to the Chinese. It has been urged that the Chinese are the posterity of Noah, and that Fohi, the first king of China, was Noah himself. Mr. Webb, an ingenious writer in the reign of Charles II, strenuously maintains that the Chinese is the only original language, and that it was spoken in Paradise. Its antiquity is said to be strengthened by its singularity, consisting, as it does, of few words, all monosyllables, and from its simplicity of construction, having no variety of declensions, conjugations, or grammatical rules.

Celtic scholars assert their language to be the most ancient.‡

\* *Le Monde primitif analysé et comparé avec le monde moderne.* Paris: 1773; containing etymological vocabularies of the Latin and French languages.

† "*Ευρεσις*."

‡ Cleland has a partiality for the Celtic. Cf. Fauchet, *Antiquités Gauloises*; Bacon, *Recherches sur les origines Celtiques*; Le Brigant, *Éléments de la langue des Celtes*; Frippault, *Celt-bellenisme*.

Pezron\* and Bullet† have discovered in the Bas Breton the root of all languages. Dr. Armstrong has gone so far as to show Celtic words in the names of places in the New World; leaving us to infer thereby that the Celts had discovered America before the time of Columbus. According to Goropius,‡ the Low Dutch was the language of Paradise. Chardin tells us the Persians believe three languages to have been spoken in Paradise; Arabic by the serpent, Persian by Adam, and Turkish by Gabriel. André Kempe says God spoke to Adam in Swedish, Adam answered in Danish, and the serpent spoke to Eve in French.§ Erro|| claims Basque as the language spoken by Adam. If we are to believe some writers, the Iberians were the fathers of the human race; and the Basque was not only the original language of Spain, but the primæval language, and that from it all languages have been derived. Their grammarians tell us that it existed before the Tower of Babel, and was brought into Spain by Tubal himself. Perhaps of all writers upon this subject, Larramendi has furnished us with the largest amount of trash. This truth-hating scholiast, in the preface to his *Diccionario Trilingue del Castellano, Bascuence y Latin*,¶ asserts that of all languages the Basque is the most perfect, the most harmonious, the most copious and rich, the most eloquent, the most easy, and the most pleasing in the variety of its dialects; that it cannot be traced to any Oriental language; and that it is not only a primitive language, but *the* primitive language. He states that 1,951 Basque words are found in the Spanish, and that the Greek, Latin, Italian, and French, have derived many words from it. According to D'Abbadie,\*\* “La langue euskarienne date des premiers siècles de notre temps historique; elle naquit durant le premier âge, dans le midi; sa vocalization vierge est divine, sa nomenclature est originale et sans mélange; l'architecture merveilleusement régulière et simple de son système grammatical achève d'en faire le dialecte le plus philosophique, le plus complet du verbe humain. Conservée jusqu'au milieu de l'âge ancien, par les Apothomites, les Anherrites, les Churites, les Muthugores et autres-peuplades de la

\* Pezron, *Antiquité de la langue Celtique*.

† Bullet, *Mémoire sur la langue Celtique*.

‡ Hermathena Joannis Goropii Becani, *Antwerpia*, 1580. *Origines, Antwerpiana*, 1589.

§ On the Language of Paradise. Cf. Max Müller, p. 131.

|| *El Mundo primitivo filosofico de la Antiquedad y Cultura de la Nacion Bascongada*, by J. B. Erro. Madrid: 1815.

¶ San Sebastian, 1745.

\*\* *Etudes grammaticales sur la langue Euskarienne*, par A. Th. d'Abbadie et J. Augustin Chabo. Paris: 1836. *Première partie*, p. 3.

Mauritanie primitive, cette langue fleurit en Espagne pendant trois milles ans, avec les Ibères-Euskariens,\* jusqu'à l'invasion des Celtes ou Tartares, dont les dialectes grossiers et ténébreux enfantèrent dans nos contrées méridionales la confusion de *Babel*. Il est donc vrai de dire, en allégorie, que la langue *Eskuera*, bien antérieure à l'établissement des barbares dans le midi, tire son origine d'*Adam*; puisque ce mythe génésique représente l'humanité des premiers âges." Again, another writer† contends that as the uncultivated populations of the two Americas could not have sprung from the ground like mushrooms, they must have emigrated from Asia, and the period of their emigration was unknown until recently. He recommends to notice a book written by Ethan Smith, a pastor in Poultney in the United States, entitled *View of the Hebrews*, etc., and comprehending accounts of various English, French, Spanish, and Portuguese tourists, who had made diligent inquiries relative to the aborigines. He says they agree in their accounts as to the primitive settlers of America, that they were all of one stock, viz., of the *ten tribes of Israel*, "who were carried away by the Assyrian kings to Halah and Habor, the river Gozen (or Ganges), and the cities of Media"; who in a short time, making their way towards the east of Asia, crossed the ice of Behring's Straits, and in time multiplied and extended themselves all over America from north to south. That although the primitive discoverers of America declared the natives to be savages, because they did not possess letters, and were treated as such by the European savages who conquered them, yet modern tourists find them (by the traditions preserved among the natives) to possess religious principles, sentiments, customs and manners, far surpassing our opinions regarding them; all which afford testimony to their having been once of the patriarchal seed of Israel. Quoting from the same work, he says, "they all inform us, agreeably to their traditions, that their primitive parent had twelve sons, of whose descendants they are a portion; that their forefathers, having transgressed against God, were made captives, and carried off far from their own country; that 2,500 years ago their ancestors left the country of their captivity, proceeded towards the east, crossed a river of hardened water, and settled themselves in America. Regarding their religion, they acknowledge a supreme power; they have priests, and some sort of sacrifices; they believe in a future state, and in rewards and punishments; and it is asserted

\* Voyage en Navarre pendant l'insurrection des Basques, 1830-1835.

† See Theological and Critical Treatise on the Primogeniture of the Holy Language, by Solomon Bennett. London: 1835. Note, p. 6.

that they use in their prayers many sacred terms with very little deviation in dialect from the original Hebrew; as *Yohswah*, '*Ale* and *Aleim*'; *Yah*, *Halleluwah*; in their political language, *shemin*, 'heaven'; *Shilu*, 'Shiloh'; *abba*, 'father'; *ish* or *ishte*, 'a man'; *ishto*, 'a woman'; *Awah*, 'Eve'; *liani*, 'a wife or concubine'; *nichiri*, 'nostrils'; *kora*, 'cold'; *Canaai*, 'Canaan'; *Ararat*, 'high mountain', etc."

Professor Müller devotes considerable space to the discovery of Sanskrit, its development in Europe, its philology, and its affinity with Greek and Latin. It is a singular circumstance that this, the most perfect of all known languages, should have been scarcely known to us before the close of the last century. It was about this epoch that it received a powerful impulse, principally from the necessities of our own government in India. The way was first opened in India by Anquetil Duperron, who was soon followed by Sir Wm. Jones, Colebrooke, Wilkins, Prinsep, and Wilson, author of the celebrated Sanskrit dictionary. In England, the study of this language is chiefly indebted to Haughton; in France,\* to Chézy and Eugène Burnouf. In Germany it of course obtained a most cordial reception, its study being principally made known by A. W. von Schlegel, G. von Humboldt, Bopp, Rosen, and Lassen. Von Schlegel and Lassen subsequently founded a Sanskrit school, having for its object not only a well grounded and complete knowledge of the language, but also of the literature and antiquities of India;† and at the present day there are few continental universities where there is not a professor of Sanskrit. It was, indeed, the introduction of Sanskrit to the learned of Europe that gave rise to "Comparative Philology". For this new science we are chiefly indebted to the labours of Bopp, Pott, Grimm, Schlegel, Pictet, Eichhoff, and Vans Kennedy, whose able work on the affinities of languages contains a comparative table of upwards of nine hundred words in Sanskrit, English, Anglo-Saxon, German, Latin, Greek, and Persian. I am, however, disposed to think that many of the words given by these writers as derivatives of Sanskrit are very doubtful; and I could name many that have been omitted.

Considering the interest that the subject has of late awakened, it may not be here thought out of the way to adduce some of the statistics that I have been able to gather on the Sanskrit element to be found in the Old World languages. Upwards of 900 Sanskrit roots have been discovered in the Greek, Latin, Persian, and Gotho-Teu-

\* Where it was chiefly introduced through Hamilton in 1804.

† Cf. P. Cye.; *Encyc. des Gens du Monde*.

tonic languages. Of these, 263 are found in Persian; 43 in German and not in English, 132 in English and not in German, whilst 119 are common to both English and German. There are 208 in Greek and not in Latin, 188 in Latin and not in Greek, and 131 are common to both Latin and Greek; whilst 31 words are common to all these languages. There are, of course, many Sanskrit roots in the Celtic and Slavonic languages; but the number has not, as far as I am aware, been ascertained. Indeed the Sanskrit roots in some Slavonic dialects probably exceed those in any European language. The Gypsy language, which is of Hindústání origin, possesses a large number of Sanskrit roots;\* and the attempt to show a connexion between the Gypsy and Slavonic languages proves rather that analogous words have been derived from a common root—the Sanskrit. In the Siamese, or language of Thai, the Peguan, the Avanesse, the Malayálam, Telugu, Karnáta, and Tamil, are found many Sanskrit words. The Malay has 516; the Javanese still more; the Zend has 53, the Cingalese, which is spoken in a great part of Ceylon, has many from the same source. Indeed, not only are most of the proper names in this island mentioned by Ptolemy, but most of the river names found on modern maps may be traced to the Sanskrit. On the other hand, what are termed the Semitic languages, as the Hebrew, Arabic, Syriac, Ethiopic, and Amharic; the Bugis, or language of the Celebes,† the Turkish, the Egyptian dialects, and the Chinese, contain very few words of Sanskrit origin; and the Armenian has probably none which have not crept in through the Greek; and, notwithstanding all that has been advanced to the contrary, I am disposed to think that the Basque does not contain any Sanskrit words which have not been derived through the Greek or Latin. And now with respect to the two hundred and fifty-one Sanskrit roots which have found their way, directly or indirectly, through Greek, Latin, Anglo-Saxon, etc., into the English language. Some of these Sanskrit words are represented by only one English word; whilst others may be discovered in composition of from two words to four thousand words; and if a proper calculation were made, I am disposed to think that these two hundred and fifty-one Sanskrit roots would be found to form part of thirty thousand English words.‡

\* Cf. *Histoire des Bohémiens*, par H. M. G. Grellmann, 8vo, Paris, 1810; also Adelung's *Mithridates* (Vater), Berlin, 1817, iv, 82-86, which contains a comparative vocabulary of a great many Slavonic and Gypsy words.

† The Bugis has many words from Malay, Tagalish, and Javanese.

‡ As a sample of the fecundity of one Sanskrit word, Professor Müller gives the root *pa's* (with the *s* found in *spa'sa*, a spy), from which he derives, indirectly, the following:—aspect, auspicious, circumspect, conspicuous, expect, inspect, inspection, prospect, prospective, respective, respectable, respite, special,

Indeed to such an extent is the English language impregnated with Sanskrit and Hebrew, that we can scarcely utter a sentence which does contain one or more words derived from one or both of those languages. Professor Müller makes the Celtic a branch of what he designates the Aryan family. He says, "Celtic words may be found in German, Slavonic, and even in Latin, but only as foreign terms, and their amount is much smaller than is commonly supposed. A far larger number of Latin and German words have since found their way into the modern Celtic dialects, and these have frequently been mistaken by Celtic enthusiasts for original words, from which German and Latin might, in their turn, be derived." In these remarks I entirely coincide. It has indeed often occurred to my mind that the attempt of Celtic scholars to trace, by implication, the Latin, Greek, and other languages to the Celtic, is puerile in the extreme. After a comparison of the Celtic dialects with the Greek, Latin, and derivative languages, the Gotho-Teutonic languages, and the Sanskrit, my own impression is that one-half of the words now found in Gaelic, Erse, Manx, Welsh, Cornish and Bas Breton owe their origin to the modern European languages, and that two-thirds of the remaining moiety may be traced to Greek and Latin. With regard to the Celtic element in English, urged with so much assurance, by some writers, I do not believe that in the whole body of the language there will be found thirty Celtic words; which is above the number that exists in Latin and Greek. On Ethnology, Professor Müller says, "The science of language and the science of ethnology have both suffered most seriously from being mixed up together. The classification of races and languages should be quite independent of each other. Races may change their languages, and history supplies us with several instances where one race adopted the language of another. Different languages therefore may be spoken by one race, or the same language may be spoken by different races; so that any attempt at squaring the classification of races and tongues must necessarily fail." This is quite true. Instance the French, a nation chiefly of Celtic origin, whose native tongue has been replaced by the Latin; for what is the French language of the present day but one in which sixteen out of every twenty words have been corrupted from Latin? Again, in Cornwall, the ancient language, a sister dialect of the Welsh, has

specialty, species, specific, specimen, specious, spectacles, spectator, spectrum, speculate, speculative, spices, spicy, spite, spiteful, spy, suspect, suspicious; and I may add, among others, despection, despicable, despise, diarespect, episcopal, inauspicious, retrospect, retrospective, and spectre.

been long since superseded by the English ; whilst in the Highlands of Scotland, where are to be found some of the purest remains of the Celtic, the English language bids fair to become the national one. The fate of language, when spoken by those subjected to foreigners of another tongue, will be seen by the following extract from Niebuhr, "Many people living under the dominion of the Arabians and Turks have lost the use of their mother tongue. The Greeks and Armenians settled in Egypt and Syria, speak Arabic ; and the services of their public worship are performed in two languages at once. In Natolia these nations speak their own languages in several different dialects. The Turkish officers sometimes extend their despotism to the language of their subjects. A Pacha of Kaysar, who could not endure to hear the Greek language spoken, forbade the Greeks in his pachalic, under pain of death, to use any language but the Turkish. Since that prohibition was issued, the Christians of Kaysar and Angora have continued to speak the Turkish, and at present do not well understand their original language." That some remains of another language may, however, survive the general wreck in different places, will be seen by the following passage from the same author. "In Syria and Palestine, indeed, no language is to be heard but the Arabic ; and yet the Syriac is not absolutely a dead language, but is still spoken in several villages in the pachalic of Damascus. In many places, in the neighbourhood of Merdin and Mosul, the Christians still speak in the Chaldean language ; and the inhabitants of the villages, who do not frequent towns, never hear any other than their mother tongue. The Christians born in the cities of Merdin and Mosul, although they speak Arabic, write in the Chaldean characters, just as the Maronites write their Arabic in Syriac letters, and the Greeks write their Turkish in Greek letters." \*

A few words on the use of the terms Semitic, Japhetic, and Caucasian, still used by some authors. The descendants of Shem and Ham, the youngest sons of Noah, are said to have peopled all the great plain situated north and west of the Persian Gulf, between that Gulf and the Indian Ocean on the east, and the Arabian Gulf and the Mediterranean on the west, with the northern coast of Africa ; comprehending Assyria, Chaldea, Syria, Palestine, Arabia, Egypt, and Lybia, and the principal languages and dialects used by these descendants, known to us under the name of Chaldee or Aramean, Syriac, Hebrew, old Phœnician, Arabic, Ethiopic, Samaritan, and Coptic

\* See Niebuhr, vol. ii, p. 259, etc. ; also Calmet, *Dict. Bib.*, by Taylor. London : 1832.

have been accordingly styled Semitic or Shemitic. The descendants of Japhet, the eldest son of Noah, are said to have peopled Asia Minor, the northern parts of Asia, about the Euxine and Caspian, and all Europe; hence the term Japhetic has been applied to the languages spoken by these peoples, in contradistinction to Shemitic. The term Japhetic will, therefore, include not only the Celtic, German, and the Greek, Latin, and derivative languages, but likewise all Asiatic languages not comprised under the term Shemitic. We next come to the term Caucasian. The name Caucasus is applied to a chain of mountains in Asia, extending from the borders of the Euxine to the shores of the Caspian, through a space of about 400 miles, and forming an almost impassable barrier between Russia, Persia, and Turkey. Blumenbach\* makes the tribes inhabiting this tract of country the basis of one of the five primary classes into which he divides the whole human race; and the term Caucasian has been also applied (in lieu of Japhetic) to the languages spoken by all races of Caucasian origin. The term Caucasian has been, to some extent, replaced by Indo-Germanic and Indo-European. Max Müller substitutes for the last two names, the technical term Aryan. Speaking of the sixteen countries mentioned in the *Zend-avesta*, he says, "The first of these countries is called *Airyanem Vaejô*, 'the Aryan seed,' and its position must have been as far east as the western slopes of the Belurtag and Mustag, near the sources of the Oxus and Yaxartes. From this country, which is called their seed, the Aryans advanced towards the south and west, and in the *Zend-avesta* the whole extent of country occupied by the Aryans is likewise called Airyâ. A line drawn from India along the Paropamisus and Caucasus Indicus in the east, following in the north the direction between the Oxus and Yaxartes, then remaining along the Caspian Sea, so as to include Hyrcania and Râgha, then turning south-east on the borders of Nisaea, Aria (i.e. Haria), and the countries washed by the Etymandrus and Arachotus, would indicate the general horizon of the Zoroastrian world. Greek geographers use the name of Ariana in a wider sense even than the *Zend-avesta*. All the country between the Indian Ocean in the south, and the Indus in the east, the Hindoo Kush and Paropamisus in the north, the Caspian gates, Karamania, and the mouth of the Persian gulf in the west, is included by Strabo (xv, 2.) under the name of Ariana; and Bactria is thus called by him 'the ornament of the whole of Ariana.'" I am inclined to think that the term Aryan will not be accepted as satisfactory, the area above given being peopled by nations

\* De Generis Humani Varietate Nativâ Dissertatio.

whose languages can hardly be classed in the same family. I think it will be admitted that although Bengálí, Uriya, Maráthí, Hindi, Guzaráthí and Persian may be classed under the Aryan group; on the other hand, Karnáta, Telugu, Tamil, and Malayálam should be placed under what Professor Müller designates the Turanian family. The chapter on the Turanian family, and especially on the Turkish branch, will deserve a careful study. Max Müller derives the word Turanian from Tura (implying the swiftness of the horseman), the original name of the Turanians. He applies the term to the nomadic races of Asia, as opposed to the agricultural or Aryan races, and likewise to all languages spoken in Asia and Europe not included under the Aryan and Semitic families, except the Chinese and its cognate languages and dialects, as, for instance, the Japanese and Anamitic. The characteristic feature of the Turanian family is what has been termed agglutination or gluing together. "This means not only that, in their grammar, pronouns are *glued* to the verbs in order to form the conjugation, or prepositions to substantives in order to form declension. That would not be a distinguishing characteristic of the Turanian or Nomad languages; for in Hebrew as well as in Sanskrit, conjugation and declension were originally formed on the same principle. What distinguishes the Turanian languages is that in them the conjugation and declension can still be taken to pieces; and although the terminations have by no means always retained their significative power as independent words, they are felt as modificatory syllables and as distinct from the roots to which they are appended. In the Aryan languages the modifications of words, comprised under declension and conjugation, were likewise originally expressed by agglutination; but the component parts began soon to coalesce, so as to form one integral word, liable in its turn to phonetic corruption to such an extent that it became impossible after a time to decide which was the root, and which the modificatory element. The difference between an Aryan and a Turanian language is somewhat the same as between good and bad mosaic. The Aryan words seem made of one piece; the Turanian words clearly show the sutures and fissures where the small stones are cemented together." As an instance of this agglutination, Professor Müller takes the Turkish verb *sevmek*, "to love," in its present tense, the root of which is *sev*, the termination *mek* or *mak* being merely used to form infinitives. "The root *sev*, to love, in the most general sense of the word, or love as a root, but expressing only the general idea of loving in the abstract, but which root can never be touched. Whatever syllables may be added for the modification of its

meaning, it must never be changed or broken, assimilated, or modified, as in the English I fall, I *fell*, I take, I *took*, I think, I *thought*, and similar forms. In Turkish, one participle is formed by adding *er* : thus *sever* will mean lov-er or lov-ing. We now get *sever* as forming the first two syllables of the verb in all its inflections in the present." The Turkish pronouns are *ben*, I; *sen*, thou; *öl* or *o*, he; *biz*, we; *siz*, you; *ânlar*, they. The present of the indicative is: *sev-er-im*, I love; *sever-er-sen*, thou lovest; *sev-er*, he loves; *sev-er-iz*, we love; *sev-er-siz*, you love; *sev-er-ler*, they love. From this it will be seen that in the second person singular and plural the pronoun is preserved intact; in the first person singular it takes the form of *im*; in the third person it is dropped altogether; in the first person plural *biz* becomes *iz*, whilst in the third person plural, *ânlar* is corrupted down to *ler*;\* but that notwithstanding this the root *sev* is always preserved. It may be here observed that agglutinative languages are not peculiar to Asia, nor to written languages. The Hottentot family of languages, and some of the American Indian languages, are exceedingly rich in words formed by agglutination. Professor Müller has little faith in the onomatopoeic and interjectional theories (which he respectively designates the *Bow-wow theory*, and the *Pook-pook theory*), the former of which was at first defended by Herder † and the latter by Condillac and others. He says, "Though there are names in every language formed by imitation of sound, yet these constitute a very small proportion of our dictionary. They are playthings, not the tools of language, and any attempt to reduce the most common and necessary words to imitative sounds ends in complete failure." . . . . "We cannot deny the possibility that a language might be formed on the principle of imitation: all we say is, that as yet no language has been discovered that was so formed. An Englishman in China, seeing a dish placed before him about which he felt suspicious, and wishing to know whether it was a duck, said, with an interrogative accent, "Quack, quack?" He received the clear and straightforward answer "Bow-wow!" This no doubt was as good as the most eloquent conversation on the same subject between an Englishman and a French waiter; but I doubt whether it deserves the name of language. We do not speak of a *bow-wow*, but of a dog. We speak of a cow, not of a *mow*; of a lamb, not of a *baa*. It is the same in more

\* The defective verb *im*, I am, comes even nearer to the termination of the present of the indicative. It runs thus, *im*, *im*, or *in*, I am; *sen*, thou art; *dur*, he is; *iz* or *iz*, we are; *siz* or *siñiz*, you are; *durler*, *lerdur*, or *ânlardur*, they are.

† Cf. Steinthal's *Der Ursprung der Sprache*, Berlin, 1858.

ancient languages, such as Greek, Latin, and Sanskrit. If this principle of onomatopoeia is applicable anywhere, it would be in the formation of the names of animals; yet we listen in vain for any similarity between goose and cackling, duck and quacking, sparrow and chirping, hog and grunting, cat and mewing, between dog and barking, yelping, snarling, or growling. There are of course some names, such as *cuckoo*,\* which are clearly formed by an imitation of sound. But words of this kind are, like artificial flowers, without a root. They are sterile, and are unfit to express any thing beyond the one object which they imitate. If you remember the variety of derivatives that could be formed from the root *spac*, to see, you will at once perceive the difference between the fabrication of such a word as *cuckoo*, and the true natural growth of words." . . . . . "Most of these onomatopoeias vanish as soon as we trace our own names back to Anglo-Saxon and Gothic, or compare them with their cognates in Greek, Latin, or Sanskrit. The number of names which are really formed by an imitation of sound dwindle down to a very small quatum if cross-examined by the comparative philologist; and we are left in the end with the conviction that though a language might have been made of the roaring, fizzing, hissing, twittering, crackling, banging, stammering, and rattling sounds of nature, the tongues with which we are acquainted point to a different origin. I am inclined to think Professor Müller has greatly underrated the onomatopoeic theory, and that all languages have derived a great many words in this way. If the English language be taken as a sample, the words derived (directly or indirectly) by imitation of sound will be found to form a large proportion of the words from which the whole language has been built up. I give the following list, which might be added to very considerably. Thus, bang, bark, baste, batter (to), bawl, bay, beat, beef, † blare, blast, blaze, bleat, blow, boil, bomb, bovine, bray, broil, brush, bubble, bucolic, bump, burn, burst, buss, buzz, cackle, cat (to), caw, chatter, chew, chirp, chough, clip, cluck, coo, cook, cough, crack, crake, ‡ crash and crush, creak, croak, crow, cuckoo, cut, daddy, dash, din, dip, drain, dribble, drill, drink, § drub, drum, echo, father, || fire (to), fizz and fizzle, flap, flash, flicker, flitter, flutter, fly, gabber, gargle, gash, giggle, gnash, gnaw, gobble, grill, grind, groan, growl, grunt, gulp, gurgle, gush, hammer, hiccup,

\* Cf. crake, crow, rail.

+ Evidently from *Boos*, *Bous*, from the sound made by the animal. *Boos*, *bov*, *bovis*, *bœuf*, beef. Cf. bovine, bucolic.

† The bird so named.

‡ From the trinking of the glasses whilst toasting each other.

|| Indirectly.

hiss, hist, hoop or whoop, howl, hush, jerk, jump, knock, laughter, lick, low (to), lump, mamma, mash, mew, mewl and miaul, moan, mother,\* mumble, murmur, mutter, neigh, palpitate, pant, papa, pat, paternal,\* patter, peal (to), piddle, pewit, pour, puff, pump, push, quack, quash or squash, rail,† rain, rap, rend, ring, rinse, ripple, roar, roll (to), rub, ruffle, rumble, rush, saw, scrape, scream, seethe, shears, shoot, shout, shuffle, shut, sick, sigh, simmer, sing, skim, slam, slap, slash, slide, slip, slit, smack, smash, snarl, sneeze, snivel, snore, snort, sob, sound, spatter, spew, spill, spit, splash, split, sputter, squall, squeak, squeeze, squirt, stammer, stamp, strike, stutter, stun, surge, tear (to), thrash, throb, thump, tick and ticket, titter, tone, tramp, trickle, tug, tuck, tush, twaddle, twitter, whack, whap or whop, whine, whip, whirl, world, whisper, whiz, yelp.‡

I agree in the main with Professor Müller's etymologies; but must take the liberty of excepting to some of them, as of the words *Erin*, *Welsh*, *feeble*, *friend*, *soul*, *sea*. I shall, however, for want of space, be compelled, for the present, to postpone what I have to say upon this subject. Professor Müller is of opinion that grammar is the criterion of language. He says, "Hervas was told by missionaries that in the middle of the eighteenth century the Araucans used hardly a word which was not Spanish, though they preserved both the grammar and the syntax of their own native speech. This is the reason why grammar is made the criterion of the relationship and the base of the classification in almost all languages; and it follows, therefore, as a matter of course, that in the classification and in the science of language, it is impossible to admit the existence of a mixed idiom." . . . "It is as impossible to derive Latin from Greek, or Greek from Sanskrit, as it is to treat French as a modification of Provençal. The same auxiliary verb can be made to furnish sufficient proof that Latin never could have passed through the Greek, or what used to be called the Pelasgic stage; but that both are independent modifications of the same original language." Again, "the only remark which the comparative philologist has to make is, that the idea of making Greek the parent of Latin is more preposterous than deriving English from German; the fact being that there are many forms in Latin more primitive than their corresponding forms in Greek." No doubt, if grammar is to be considered as the only criterion of language, that the Latin could hardly have been derived from the Greek; at the same time, if both these languages are compared with the Sanskrit—and for this purpose we need

\* Indirectly.

† The bird so named.

‡ See also *Dictionnaire raisonné des onomatopées*, par Ch. Nodier, 2nd ed. 1828.

only compare the present tense of the verb "to be", the crude form of which is *as* or *es*, with the Greek, Latin, old Slavonic, and Gothic—there can be little doubt that the grammar of each has been derived from the Sanskrit. There are, doubtless, some forms in Latin more primitive than their corresponding forms in Greek, and others which come nearer to the Sanskrit than do the Greek; nevertheless, it cannot be denied that the Latin is indebted to the Greek for very many words. We must not be guided by a cursory glance at our Latin dictionaries, containing at least 40,000 words, in order to arrive at a proper conclusion with regard to the number of words which the Latin has borrowed from the Greek. If these are carefully examined, it will be evident that the Latin language has been built up from a very few words indeed. Mr. Hall\* reduced it to 1,321 root words; but even many of these will be found to be compounds, and may probably be brought down to 900 or 1000; and I do not hesitate to assert, notwithstanding all that has been stated by some able philologists to the contrary, that more than one-half of these have been derived from the Greek.†

One of the most interesting chapters of the work is that on the origin of grammatical forms. It has hitherto seemed to most minds that any attempt to discover the origin of the different inflections would prove hopeless. To be sure, Bellot and others have endeavoured to account for some terminations, but with little success. Professor Müller has led the way to the discovery of this very curious riddle in the science of language. For instance, he considers the termination *bo* in *amabo* is the old auxiliary *bhú*, to become (a word, by the by, from Sanscrit, *bhu*, to be), and that *ow* as the termination of the Greek future, is the old auxiliary, *as*, to be (the final letter being, of course, the only etymological part of the word). Again, he shows clearly that the final letter in the preterite *loved* is the auxiliary verb *to do*, and that *I loved* is the same as *I love did*, or *I did love*. This he proves by a comparison with the Gothic and Anglo-Saxon. Thus the preterite singular of the Gothic *nasjan*, to flourish, which is *nas-i-da*, *nas-i-dés*, *nas-i-da*, becomes, in Anglo-Saxon *ner-ē-de*, *ner-ē-dest*, *ner-ē-de*. The auxiliary verb *to do*, in Anglo-Saxon, is in the singular *dide*, *didest*, *dide*. If, says he, we had only the Anglo-Saxon

\* Principal Roots of the Latin Language. London: 1825.

Root substantives	-	-	-	-	657
" adjectives	-	-	-	-	252
" verbs	-	-	-	-	412

1321

† In order not to exceed the required limits, the vocabulary of these words has been reluctantly omitted. It shall, however, be given in some future paper.

preterite *nerēde*, and the Anglo-Saxon *dide*, the identity of the *de* in *nerēde* with *dide* would not be very apparent. In the Gothic singular *nasida*, *nasidés*, *nasida* stand for *nasideda*, *nasidedés*, *nasideda*. The same contraction has taken place in Anglo-Saxon, not only in the singular, but in the plural; yet such is the similarity between Gothic and Anglo-Saxon, that we cannot doubt that their preterites have been formed on the same last; and if there is any truth in inductive reasoning, there must have been an original Anglo-Saxon preterite *ner-ē-dide*, *ner-ē-didest*, *ner-ē-dide*; and as *ner-ē-dide* dwindled down to *nerēde*, so *nerēde* would, in modern English, become *nered*, and therefore the *d* of the preterite I *loved* was originally the auxiliary verb to *do*. Further, "it might be asked, however, very properly, how *did* itself, or the Anglo-Saxon *dide*, was formed, and how it received the meaning of a preterite? In *dide* the final *de* is not termination, but it is the root, and the first syllable *di* is a reduplication of the root; the fact being that all preterites of old, or, as they are called, strong verbs, were formed, as in Greek and Sanskrit, by means of reduplication; reduplication being one of the principal means by which roots were invested with a verbal character. The root *do*, in Anglo-Saxon, is the same as the root *θη* in *τιθημι*, and the Sanskrit *dhd* in *dadhāmi*. Anglo-Saxon *dide* would, therefore, correspond to Sanskrit *dahhau*, I placed." Further, he shows that the Romance future was formed on a totally different principle to the Latin future in *bo*, the former being originally a compound of the auxiliary verb to *have*, with an infinitive; and that in French I *have to say* (*je-dir-ai*), easily took the meaning, I *shall say*. Again, Professor Müller proves that the final syllable *bam* in *catabam* (whence *ba* in Spanish *cantaba*, and *va* in Italian *cantava*), was originally an independent auxiliary verb, the same which exists in Sanskrit *bhavāmi*, and in Anglo-Saxon *beom*, I am. He also accounts for adjectival forms; but the subject, although exceedingly interesting, is not within our present limits.

In the chapter on "Dialectic Regeneration" Professor Müller says, "Dialects have always been the feeders rather than the channels of a literary language; anyhow, they are parallel streams which existed long before one of them was raised to that temporary eminence which is the result of literary cultivation. . . . Before there is a national language, there have always been hundreds of dialects in districts, towns, villages, clans, and families.\* That a language may

\* Those who assert that languages were originally formed from dialects, go far to disprove the common origin of languages.

be made up of many others we need only name the English, which although principally based upon Latin and Saxon, is a *mélange* of upwards of fifty languages. That a dialect, and even a branch of a dialect, may itself become a language, is proved by the different dialects of the Greek, as the Eolic, Doric, Attic, and Ionic, which in later times were justly entitled to the appellation of languages. Again, the Polish and Russian, which, although at first merely dialects of the Slavonic, are now entitled to rank as languages. On the other hand, it would be absurd to say that the most ancient languages had their origin in dialects. It is quite the reverse. What is the meaning of the word dialect? A dialect is "the branch of a parent language, with such alterations as time, accident, and local alterations have occasioned." Dialect is indeed to the principal language what variety is to species. Grimm\* says "Dialects develop themselves progressively, and the more we look backward in the history of language the smaller is their number, the less definite are their features. All multiplicity arises gradually from an original unity." On the other hand, Max Müller tells us that the progress of civilization and centralization tends to reduce the number of dialects, and to soften their features. This is strengthened by some facts which Professor Müller himself gives incidentally. He says, "We are told by Pliny that in Colchis there were more than three hundred tribes speaking different dialects; and that the Romans, in order to carry on any intercourse with the natives, had to employ one hundred and thirty interpreters. This is probably an exaggeration, but we have no reason to doubt the statement of Strabo, who speaks of seventy tribes living together in that country which, even now, is called 'the mountain of languages.'" Whatever may have been the tendency in the early ages of the world, there can be no doubt that in modern times dialects have not increased in number, but rather the reverse. The greater the intercommunication between the peoples of the earth the fewer will be the number of dialects. Dialects of neighbouring peoples will coalesce, whilst dialects in general will give place to the more polished language.†

Professor Müller gives some account of the principal European languages, but says nothing in relation to the Basque; and perhaps I

\* *Geschichte der Deutschen Sprache*, s. 833; Max Müller, p. 51.

† There never has existed a country so vast, and a population so large as that of the United States, with so little variety of dialect, which is owing to the quick and constant communication between the different parts of the country, and the roving spirit of the people, the great mass of whom, besides, derive their descent from the same stock.—*Encyc. Amer.* (Lieber); Phil., 1830, in voc. "Dialect."

have scarcely room here to enter much on the subject. In addition to what I have already said, I will simply remark, first, that the Basque cannot be classed among the Celtic languages, and that it contains very few Celtic roots; secondly, that if compared with the Finnish, Lapponic, Hungarian, and Georgian languages, it will be found to belong to the Tatar family; thirdly, that it has no words direct from the Sanskrit; and that any Sanskrit roots that it possesses have crept in through the Greek, Latin, or derivative languages; fourthly, that it has one affinity with the Scandinavian languages, in the postponement of the definite article; and fifthly and lastly, that, if compared with the Greek and Latin, it will be found to have borrowed a very large number of words from those languages.\*

And now with regard to the common origin of languages. Grotius is of opinion that though the primitive language of mankind nowhere exists in its original form, that nevertheless traces of it may be found in all the languages now spoken; a bold assertion for any one to make; for what linguist ever did or ever could compare all the languages of the globe, so as to have the means of ascertaining whether they contain traces of a primitive idiom. Professor Müller argues only for the *possibility*, not for the *probability*, of a common origin. He says nothing necessitates the admission of different independent beginnings for the *material* and *formal* elements of the Turanian, Semitic, and Aryan branches of speech; and that it is possible even now to point out radicals which, under various changes and disguises, have been current in these three branches ever since their first separation. In reference to this, I would ask when the separation (if any) took place, and what evidence we possess on the subject? It would seem that the mention of the word "separation" in this place is assuming the whole question. I would ask, moreover, what are the radicals in the three branches of language which have been current since such separation: and is it not more than probable that they are accidental? Professor Müller admits that it is impossible to derive the Aryan system of grammar from the Semitic, or *vice versa*; yet he perfectly understands how, either through individual influences, or by the wear and tear of speech in its own continuous working, the different systems of Asia and Europe

\* Azais derives the Basque from the Hebrew, through the Carthaginian, Phœnician, and Syriac! Dr. Webster says the Basque or Cantabrian in Spain, the Gaelic in the north of Scotland, and the Hiberno-Celtic, or native language of Ireland, are the purest remains of the ancient Celtic! This only shows that Dr. Webster cannot have looked into the Basque. If he had done so, it may be doubted whether he would have been able to discover twelve Celtic words.

may have been produced. I cannot see it myself. The differences between these three branches, and between them and other languages, have continued so long that we can hardly suppose them to have had a common origin. Let us take, for example, two of the most ancient languages, the Chinese and the Sanskrit. These two languages, or as the latter is not now spoken, the languages derived therefrom, have been proved to have existed at least 4000 years; the one monosyllabic and atactic, the other polysyllabic and syntactic.\* It does not appear that during this period they have at all approached nearer to each other, and, in their general structure and character they remain the same; and if such be the case, are we to assume that prior to the time to which we are enabled to trace them, language could have undergone so many changes in its organic structure as to have produced the different systems of Asia and Europe. But if we are to take the vulgar theory of the age of the world—say 6000 years—to be the correct one, the thing is still more improbable; for if there has been no material change in these two languages during the last 4000 years, on what ground are we to presume that some violent change should have taken place within the previous 2000 years. The same remarks might be made on other languages, as the Hebrew and kindred languages; the Basque, the Greek, and the Slavonic languages. The Tatar conquest made no alteration in the structure of the Chinese idiom; nor has the Basque lost its grammatical forms, notwithstanding that the people of this part of Spain have been for ages surrounded by nations speaking languages whose idioms are entirely opposite.†

Max Müller makes no mention of the African and American languages, or the Polynesian and Australian dialects, which, we shall hereafter see, amount in number to nearly all the languages of the globe put together. All these languages and dialects are more or less ancient, and some of them may be traced, it is said, as far back

\* It is a remarkable fact that in Japan two languages exist at the same time; the one monosyllabic and atactic, like the Chinese; the other polysyllabic, with numerous inflexions and grammatical forms. The former is called the *Koye*; the latter the *Yomi*. Both are in use at the same time, and occasionally intermix with each other, still preserving their general character and peculiar structure. See *Elémens de la Grammaire Japonaise*, par le P. Rodriguez, traduits du Portugais, par M. C. Landusse, Paris, 1825; and *Encyc. Amer.* (Lieber); *Phil.*, 1832, in voc. "Philology".

† Cf. Partington, *Brit. Cyc.* Between the Chinese and the Cherokee it would be difficult to find the least etymological affinity; and if the distance of places is assigned as the cause, we will instance the Bengali, a language spoken in a country not far from China, and which differs from the Chinese full as much as Mohawk from Potawatomee; *ib.*

as the Chinese and Sanskrit; and yet their organic differences have remained the same for ages. We find in them idioms of different structure, having characters of their own, of which it would be in vain to seek for traces in a primitive tongue.\* Independently, however, of grammar, a comparison of words should be made. That the European and Asiatic languages have many words in common there can be no doubt. On the other hand, some of the most ordinary words are totally dissimilar in very many languages; and I am disposed to think, that taking into account phonetic decay, wear and tear of words, and other causes, there remains scarcely any possibility of their having had a common origin. I will merely give a few of such words, reserving for a future paper to extend the list. The word *gold*, which in the Gotho-Teutonic languages is found written *gull*, *guld*, and *goud*, and in the Tatar *goltz*, can have no etymological connection with Latin *aurum* (whence Spanish and Italian *oro*, French *or*, Gaelic *dir*); nor with Polish *zloto*, Greek *χρυσος*, Sanskrit *kāṇḍkā*, Arabic *zahab*, Persian *zur* and *tílá*, Hindústání and Bengali *soná*, Turkish *altún*, Malay *amas* or *mas*, Quichua *cúri*, Bugis *ulawöng*, Egyptian *vouß*, Anamitic *vàng*, Chinese *kin*, Malagasy *volamena*. Compare English *moon*, Latin *luna*, Greek *σεληνη*, Persian *parú*, Turkish *ái*, Sanskrit *chandra*; English *water* (Greek *υδωρ*), Latin *aqua*, Malagasy *mandena*, Birmese *re*, Mandchu *mouke*, Bugis *uwae* (Oceanic *vai*), Tonquinese *nou-di*, Chinese *shühy*; English *sea*, Arabic *bahr*, Turkish *dengiz*, Sandwichian *kai*; English *house*, Greek *οικος*, Mandchu *po*, Arabic *baít* (Hebrew *beth*), Marquisian *hae*, *fae*, Chinese *üh*, *fang üh*, *kea*, *chou kea*, Turkish *av*, Bugis *bolah*, Hindústání *ghar*; English *mountain* (Latin *mons*), German *berg*, Greek *οπος*, Turkish *tágh*, Pushto *ghar*, Quichua *urcu*; English *bread*, Latin *panis*, Finnish *leipä*, Malay *róti* Chinese *méen tow*, *méen paou*, Javanese *redjekkí*, Japanese *moci*, Armenian *zhats*, Georgian *puri*, Coptic *oik*, Ethiopic *sifai*, Chilian *cobque*, Mexican *remiou*.

I will conclude with a few remarks upon the statistics of language. Francesco Lopez, a native of South America, who had extensive knowledge of both continents, thought it no rash statement to make, that the idioms, *notabilmente diversi*, of both Americas amounted to at least 1,500 † The Abbé Rozo says that the inhabitants of the two Americas spoke not less than 2,000 languages. Father Kircher informs us that American missionaries make the South American languages amount to 500; while the Abbé Clavigero had cognizance

\* Partington, Cyc.

† See Hervas, Cat. Ling., p. 11.

of 35 idioms spoken in Mexico. The *Imperial Dictionary*,\* compiled at the instance of the Empress Catherine, which was published in the year 1787, contains a list of 285 words, translated into 51 European, and 149 Asiatic languages. A second edition of this work, in which the words are arranged alphabetically, appeared in 1790-91, in 4 vols., edited by Jankiewitsch de Miriemo. This edition contains, according to some, 279 languages; 171 for Asia, 55 for Europe, 30 for Africa, and 23 for America.† The authors of the *Mithridates* increased the number of known languages and dialects to 2,000; which Friedrich Adelung‡ augmented to 3,066, geographically distributed as follows:—

Asiatic	-	-	-	987
European	-	-	-	587
African	-	-	-	276
American	-	-	-	1,214

3,064§

The numbers of those who speak the different languages made use of in America are thus distributed. English, 11,647,000; Spanish, 10,174,000; Portuguese, 3,740,000; Indian, 7,593,000; French, 1,242,000; Dutch, Danish, Swedish, and Russian, 216,000.||

With respect to the number of words contained in some of the principal languages, in the following, I can only give the approximate number. The Arabic contains about 150,000; the Hindústání, 18,000; the Sanskrit, 27,000; the Malay, 13,000;¶ the Puk'hto or Pus'hto, 22,000; \*\* the Egyptian, 4,000; the Armenian, 30,000; the Turkish, 50,000; the Mandchu, 16,000; the Latin,

\* *Glossarium Comparativum Linguarum totius Orbis*. Petersb., 1787.

† According to Pott (*Ungleichheit*, p. 230), it contains 277 languages; 185 for Asia, 22 for Europe, 28 for Africa, 15 for America. This would make 280. Max Müller. [It would rather add up 250. R. S. C.]

‡ *Übersicht aller bekannten Sprachen und ihrer Dialekte*, von Friedrich Adelung, 8vo, pp. xiv 186. St. Petersburg, 1820.

§ About twenty of the Italian dialects have been reduced to writing, and made known to the press. The dialects of France are almost as numerous as her provinces. Languedoc alone has seven or eight distinct dialects.—Champollion-Figeac reckons the most distinguishable dialects of France at fourteen. The number of modern Greek dialects is carried by some as high as seventy. (Cf. Marsh, p. 678; Sir John Stoddart's *Glossology*, s. 31, and p. 29 and 33.) The principal British dialects are those of Norfolk and Suffolk, Kent, Durham, Gloucestershire, Essex, Yorkshire, Worcestershire, Herefordshire, Dorset, Sussex, Devonshire, Warwickshire, Cornwall, Derbyshire, Westmoreland, Cumberland, Sheffield, Shropshire, Lancashire, Somersetshire, Cheshire, Northumberland, Craven, and the Scottish dialect.

|| *Encyc. Amer.* (Lieber); *Phil.*, 1829.

¶ Marsden's *Dictionary* gives about 6,000; Crawford's about 13,000; which includes many proper names.

\*\* Larramendi, in his day, gave the number at 13,305 only.

40,000; the mediæval Latin, 100,000; the Greek, 89,000; the Spanish, 25,000; the Italian, 50,000; the French, 42,000; the Gaelic, 23,000; the Irish, 50,000; the Welsh, 40,000; the Russian, 40,000; the Polish, 24,000; the Anglo-Saxon, 25,000. Flügel, in 1843, estimated the number of German words in his own dictionary at 94,464, of which 65,085 were simple, 29,379 compound. Thommerel gave the number of words in the English dictionaries of Robertson and Webster as 43,566, 29,853 of which he derives from Classical, 13,230 from Teutonic (Anglo-Saxon), and the rest from miscellaneous sources. Todd's edition of Johnson, however, is said to contain 58,000 words, and the later editions of Webster, which contain the particles of the present and perfect, have reached 70,000;\* but, if every word were included, the number would probably now exceed 80,000. The Hebrew words in the Old Testament amount to 5,643. The Hindi has exactly 6,000 words;† the languages of the Marquesas and the Sandwich Islands, 6,123; the Provençal, 107,201. The cuneiform inscriptions of Persia contain no more than 379 words, of which 131 are proper names. The vocabulary of the ancient sages of Egypt, as far as it is known to us from the hieroglyphic inscriptions (as given by Bunsen), amounts to about 658 words. The number of hieroglyphic groups in Sharpe's *Egyptian Hieroglyphics* (1861), amounted to 2,030. There are about 450 radicals or sounds in the Chinese language, which by various accents and intonations are raised to 1,263.‡ Mr. Crawford§ says an examination of 4,074 radical words of the dictionary shows that the Malay language is composed of the following lingual elements:—Native Malay words, 2,003; common to the Malay and Javanese, 1,040; Sanskrit, 199; Telinga, 23; Arabic, 160; Persian, 30; Portuguese, 19. He says, further, an examination of the Malay, including its foreign elements, shows that, out of 1,000 words, 285 are common to it and the Javanese; and a similar

\* Cf. Marsh's *Lectures*, p. 182; and Max Müller, p. 271.

† Cf. Dr. Hunter's *Hindustani Dictionary*.

‡ The exact number of words contained in the Imperial Dictionary of Khang-hi amounts to 42,718. About one-fourth part has become obsolete, and one-half of the rest may be considered of rare occurrence, thus leaving only about 15,000 words in actual use. The number of the classical characters is 42,718, but many of them are no longer in use in the modern language. (Stanislas Julien.) Cf. Müller.

§ *Grammar and Dictionary of the Malay Language*, by John Crawford, F.R.S. 8vo, London, 1852. At vol. i, p. 73, speaking of the whole body of the language, he says it contains 516 words from the Sanskrit; 750 from the Arabic; 95 from the Persian; 40 from Tälugu or Telinga; and 37 from Portuguese. He says, further, that the earliest example of Malay is the Vocabulary of Pigafetta, in 1521, which contains 344 words only, 270 of which can be readily ascertained to be the same language as that spoken at the present day.

one of the Javanese, that 240 out of 1,000 are common to it and the Malay; and that of the Malay 715 parts, and of the Javanese 760, appear to be native.

Professor Müller tells us that Sanskrit grammarians have reduced the whole growth of their language to 1,706 roots;\* but he is of opinion that the primitive sounds expressive of different meanings requisite for the etymological analysis of the whole Sanskrit dictionary would not amount to one-third of that number, and he doubts whether they may not be reduced even to 500 words; that Renan† has reduced the Hebrew to about the same number; and that Benloew‡ estimates the necessary radicals of Gothic at 600, and of modern German at 250. The Latin primitives contained in the Index Etymologicus of Gesner's *Thesaurus*, amount to 2,400;§ but, as I have before said, they may be reduced to some 900 or 1,000 words. The Greek primitives given by MM. Port Royal amount to 2,200, but might, perhaps, be reduced to about 1,200.

The following tabular form gives the proportions of vowels and consonants in some of the principal languages.¶

	Cons.	Vowels.	
Sandwich Islands	- 1	1·8	
Greek { Ionic dial.	- 1	1·333	
{ Attic dial.	- 1	1·006	
Portuguese	- 1·02	1	
Common Arabic	- 1·08	1*	
Italian	- 1·1	1	
Seneca Indians	- 1·18	1	
Chahta Indians	- 1·2	1	
Sanskrit	- 1·2	1*	}
Latin	- 1·2	1	
Hebrew	- 1·2	1*	}
Spanish	- 1·24	1	
Persian	- 1·33	1*	}
Malay	- 1·33	1	
French, phonic prop.	- 1·34	1	orthographic 1·27 : 1
Dutch	- 1·5	1	
English, phonic prop.	- 1·51	1	orthographic 1·52 : 1
Swedish	- 1·64	1	
German, phonic prop.	- 1·7	1	orthographic 1·64 : 1

\* Benfey, *Grammatik*, § 147. + *Histoire des Langues sémitiques*, p. 138.

† P. 22. § See Vans Kennedy. || *Ibid.*

¶ See *Encyc. Amer.* (Lieber), *Phil.*; 1830, in voc. "Consonants". Those marked with \* are counted phonically.

## THE INFLUENCE OF RACE ON ART.\*

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THE relationship of race to art is part of a larger subject, the connection of organization with mental manifestations, a great problem, involving in its profounder bearings some of the most important questions which can be submitted to our investigation. As a sphere of almost untried inquiry it opens up to us vast realms of possibility, in which the discoveries of exact science have yet to supersede the vague and unsatisfactory hypothesis of ill-informed speculation. In truth it is a province of vast extent, and with manifold subdivisions. Descending on one side to the minute specialties of individual development, as expounded by the phrenologists, it ascends on the other to the effect of racial type on national character. Nor does it stop here. For if organization be a reliable index of mental power, then are we enabled, through its aid, to pass beyond the limits of our own especial form of being, and, guided by their structure, proceed to admeasure the qualities and capabilities of the various genera, orders, and classes which compose the manifold gradations of the animal kingdom. Indeed till this has been accomplished comparative anatomy will be imperfect, and lack its crowning glory, as a revealer of beauty and harmony—not only in the organic, but also in the mental sphere as correlated to it. Without, however, at present entering into this department of the subject, which would indeed ultimately lead us up into the metaphysical region of abstract thought, where mind and matter, God and nature, constitute the subject of debate, we shall not perhaps be thought to unduly transcend the appropriate limits of this journal by a few remarks on racial type and mental power.

The venerable controversy respecting the effects of nature and education seems to be of almost world-old antiquity, and men, according to their several proclivities, have arranged themselves on the one side or the other, and probably on each have carried their respective views to excess. The savans, perhaps, exaggerating the importance of natural endowment, have somewhat undervalued the influence of

\* *History of Modern Architecture; with an Appendix on Ethnology from an Architectural Point of View.* By James Fergusson. London: John Murray, 1862. 12mo, pp. 538.

circumstances, while the scholars altogether overestimating the force of circumstances have practically ignored the existence of inherent powers and disqualifications. And thus it has come to pass that history is what we find it, for the bookmen have hitherto possessed the monopoly of its composition, and have accordingly converted it into a chronicle of events, whereto the actors are regarded as quite subordinate accessories. Many signs, however, indicate that the days of this pleasant pedantry are ended, and that the time has come for looking the facts of race fairly in the face. Indeed the very revolutions and wars with which we are cotemporary, bring the question of hereditary type and character so forcibly into view, that not only are able editors becoming smartly ethnological in their leaders, but venerable statesmen and astute diplomatists are beginning to admit that the decisions of cabinets are not the sole influences which modify the destiny of nations. And, accordingly, in addition to their own sage opinion as to the fitness of things from the court standpoint, are prepared to regard racial tendency as one of the active and influential forces in the political scheme. Nor can this idea fail to grow, for it is supported by the whole past and the entire present of our race. Whether we regard the grander divisions or the minor varieties of man, it is found that type has combined with circumstances to modify civilization, and give it a character not simply geographical, but also racial. Thus no one at all acquainted with history and antiquities would expect the devout Semites to exhibit characteristics identical with those of the intellectual Aryans; nor will any one familiar with the latter attempt to confound them with their religious converts, the Tamul peoples of the south. It is the same in Europe, where the ancient classic type stands broadly distinguished from Sclavon or Teuton, as both of these, in an almost equal degree, are separated from the Celt. Nor are these distinctions perceived only by professed Ethnologists; they are equally seen and acted on by practical men, by the merchant in his adventures, the sailor in his voyages, and the soldier in his wars; and are indeed as well known to the simplest private as to his superior officers. Nay, it is practical men, not theorizing anthropologists, who are prone to carry out these distinctions into the rather stern and tyrannical result of caste, as we see wherever the negro and Caucasian, under whatever nominal relationship, actually meet face to face on the great highways of life. Nor can this be otherwise; for as diversity of race is a fact in nature, it will force an acknowledgment of its existence, whether from the most careless or most prejudiced,

provided they are only placed in circumstances where it is impossible to ignore the evidence of its presence. Neither were these ethnic differences first discovered in modern times; they were almost as familiar to the ancients, in so far as their knowledge extended, as to ourselves, and are at the present moment quite as much insisted on by barbarous tribes as by civilized nations.

It is not indeed the discovery, but the ignoring, of ethnic diversities which may be regarded as a modern invention. Antiquity never thought of confounding the races of men, and heathendom has never attempted it. They had no motive, their scheme of mythology did not require, and their social arrangements did not demand it. They did not believe, as a matter of faith, that all mankind were of one race; nor did they profess to enforce by law or sanction by custom a nominal equality, based on a real diversity. We in these latter times have been the victims of theory, in both respects; for we have fancied ourselves theologically bound by our creed to the profession of a racial unity, and by our social customs to the maintenance of an equality. It being apparently forgotten by all parties, theologians and socialists alike, that nature's scheme of being is not a democracy but a hierarchy, whose various grades are all distinctly marked and duly subordinated. An arrangement, commencing with suns and their systems, and descending to the minutest genera of organic existence, and which might, therefore, be legitimately expected in that grandest of nature's organic spheres, the races of man.

Perhaps another reason for the popular confusion of ideas on the subject of race now prevalent, is the fact that merely literary men seem to think themselves quite competent, if not to write works expressly on the subject, at least to review them, and pronounce flippant criticisms *ex cathedra* on topics of which they are about as well informed as of the effects of tangential and radial force, or any other of the more recondite departments of astronomy, which they would very properly leave to the professors of that especial province of inquiry. With the progress of anthropological science, however, this absurdity cannot fail to be ultimately corrected; but in the interval the conductors of our periodical literature do not seem to feel that there is the least necessity for placing ethnological works in the hands of duly qualified persons—if indeed such could be readily found. And the result is what we see, the great questions of racial origin, interaction, and relationship treated almost wholly from the theological and scholarly standpoint, biblical texts and philological affinities being employed with childlike confidence to settle disputes

which the profoundest study of mental characteristics and organic type has still left uncertain. All this, however, is but an inevitable accompaniment of the imperfect development of ethnology itself, which has yet scarcely vindicated its claim to be regarded as a science in general estimation.

With a full recognition of the reality of race, however, must come a proportionately frank admission of its importance. Once grant inherent diversity of endowment, and the inevitable result of this, in proportionate diversity of manifestation, cannot fail to follow as an unavoidable corollary, from which there is no escape. And to this, slowly yet surely, reluctantly yet under the resistless compulsion of fact and logic, the collective mind of civilization is determinately marching. It is, indeed, a bourne at which all duly qualified thinkers have already arrived, and the ultimate conversion of the lettered million is now merely a question of time. Within ethnological circles, indeed, the right to treat religious, political, literary, and artistic questions racially is unchallenged, the only opposition to such a procedure being from outsiders, whose antiquated prejudices may be very respectfully yet very decidedly ignored. That every distinctly marked type of humanity tends to develop its own creed and code, its peculiar faith and institutions, its specially characterized modes of thought and forms of beauty, is now denied by none but those whose opinions on such a subject are justly devoid of importance. For few things are more thoroughly insignificant than the decisions of ignorance blindly echoing the traditional errors of an outworn past, in a vain endeavour to control the direction and limit the range of modern thought by the senile voice of ancient authority.

Any attempt at a full definition of all the effects of race would yet, however, be premature. We want more reliable data than any that are yet in our possession, for the successful achievement of so great a design, for the effective realization of so grand an idea, to which, therefore, we can only make a remote and tentative approach, which, if it land us anywhere nearer the goal must be regarded in so far as a success. Ere we can treat of religion, for example, from the ethnological standpoint, we want to know more, not only of the mental constitution of races, but of the succession and development of faiths, than scholars are qualified to give, or the world is prepared to receive. It is the same with those other departments of inquiry to which we have alluded, politics, literature, and art, all demanding more data for their ethnic illustration than cotemporary learning is able to supply. But while granting this, and thus admitting not only the

possibility but the probability of error, it is nevertheless well that we should occasionally attempt the solution of some of these grander racial problems, if only that we may be thus made more fully aware of our deficiencies, and see more clearly in what direction, and on what particular subjects we lack the information requisite for a more effective prosecution of our inquiries.

And here let us throw out a word of caution to ethnologists, as we have previously done to their rivals, the scholars. In the advocacy and exposition of a struggling truth we are prone not only to exaggerate its importance, but while doing so to proportionately undervalue everything else. Thus, for example, while dwelling with well-intentioned pertinacity on the effect of race upon the development of art, we are prone to overlook the influence of circumstances as manifested in the spirit of successive eras, forgetting that it is ever by a combination and interaction of the outward and the inward, of environment and endowment, that man attains to the condition in which he has at any time existed. Compare, for instance, the art of mediæval with that of modern Europe, and you see at once the stupendous power of extraneous influences in modifying the manifestations of artistic proclivity in the same race, who, under the inspiration of a faith favourable to æsthetic culture, covered Europe with cathedrals, while in the puritanic severity of their earlier Protestantism, they were equally contented to worship in barns. Facts like these should make us cautious in the assertion of racial influence, lest in the excess of our zeal we overstate the truth, and so prepare the way for a future reaction in public opinion unfavourable to the prosecution of those very studies which seem to us so all-important.

From what has been said in the previous pages, it will be obvious, that we think a work on ethnology, in relation to art, demands attainments seldom, perhaps never yet, united in the same person. And it will, therefore, not be esteemed a very severe verdict, when we say that Mr. Fergusson is utterly incompetent to the task which he has undertaken in the appendix to his last work, *The History of Modern Architecture*, wherein, under "ethnology from an architectural point of view," he exhibits a most lamentable ignorance of the very elements of ethnic science, and confounds names and races with a reckless audacity that shows only how little he has read, and how much he has yet to learn, on the subject. He commences in error, regarding the creation of *one* PERFECT pair at the beginning, as in the present state of our knowledge the most probable of all the suggestions yet offered for a solution of the problem of race; whereas

it is precisely the most difficult, whether as regards the element of unity or perfection, but with both together is, as an ethnic hypothesis, practically unworkable. He proceeds in error, for he considers that mankind began with civilization, and have degenerated into barbarism, in consequence of their separation from the parent stock. While in strict correspondence with this, he regards the highly inflectional Indo-Germanic languages, more especially in their purer Sanscrit forms, as a remnant of the *primitive* tongue; while all philologists know that they are essentially conglomerate, and imply from their very structure the previous existence of monosyllabic and non-inflectional languages. Just as all archæology takes us back to the stone period of primitive savagism as the original condition of untutored man, whose primal civilization in a paradisaical and golden age, is obviously one of those traditional myths that sooner or later must succumb before the stern teachings of demonstrable fact.

The foregoing, however, are perhaps not so much the speculations of Mr. Fergusson, as the accepted dogmata of the school in which he has learned his slender elements of ethnic lore. But it is quite otherwise with his nomenclature and arrangement of races; for here there is a specialty of misconception and misstatement, for which no recognized school of ethnologists can be held justly responsible. He arranges mankind into four divisions, thus:—

TURANIANS—SEMITES—CELTS—ARYANS,

embracing under the first, it might be supposed, all the non-Caucasian or imperfectly developed races; and under the three last all the varieties of the latter. But even this rude classification is beyond him, as his use of the word Turanian at once indicates. Admitting that as a generic term it includes the Tartars and Mongols proper, and so covers the Chinese, Tungouses, Magyars, Lapps, and Finns, he nevertheless proceeds to inform us, with all gravity, that the ancient Egyptians were the typical Turanians, who it seems, as Phœnicians, were also the builders of Solomon's Temple. Serious criticism is here obviously impossible, and we can only say that when a man of Mr. Fergusson's ability and general attainments, can venture to put such ideas into respectable print it certainly demonstrates that the Anthropological Society has not made its appearance before it was wanted.

Strange to say, Mr. Fergusson's fundamental misconception in connection with the Turanians is in relation to his own profession; for he regards them as the great master builders of the world. Now the pure or typical Turanian is a tented nomad, who at most heaps

a mound of earth upon the corpse of his departed chieftain; and, in strict accordance with this, his grander labours, even when settled in civilized and agricultural communities, are still earthworks, sometimes imposing for their extent, but never admirable for the taste or skill evinced in their erection. It is the Caucasian who is the builder, beginning with the cyclopean, advancing through the Egyptian, and ultimately attaining to the classical and gothic styles of true architecture. When the pure Mongol attempts a temple, it eventuates in a porcelain tower at Nankin, simply a series of tents in superposition. To speak of the Tamul architecture of Southern India as a veritable product of Turanian genius, is like citing the massive grandeur of the Rhameses, as a proof of the innate greatness of the negro. In neither case were the primitive peoples of Eastern Asia or Southern Africa masters of the situation; on the contrary, in both we may safely predicate the presence and predominance of Caucasian rulers as the producing cause of those monumental remains, which now characterise these distinctly marked areas of ancient civilization. The truth is the pure Mongol is never an artistic builder, except under Caucasian leadership, and we may add in obedience to Caucasian designs; and it need scarcely be added that the same remark applies with still greater force to the negro, whose palace is a cottage, and whose temple is a hut.

Mr. Fergusson is equally unfortunate in his remarks on the Semites, who it seems never erected a building worthy of the name; and yet their especial areas in Western Asia and Northern Africa are still among the most important monumental sites on the globe; while the Saracenic architecture of Spain is the admiration of the world. But when we remember that the author has spoken of the Egyptians and Phœnicians as Turanian peoples, it may be concluded that our difference of opinion with him on this subject is not as to facts but names. That the Semitic type has hitherto proved incapable of attaining to the highest form of æsthetic culture may be readily admitted, but it should be remembered that the Jews, who are obviously Mr. Fergusson's typical Semites, were never the artistic section of the race, being surpassed in this not only by the Egyptians and Assyrians, but also by their nearer congeners, the Syro-Phœnicians and (Saracenic) Arabs. It is the last, who were probably the purest and highest form of the race, that is the most nearly free from Mongolic taint on the one hand, and from Negroid admixture on the other, whose lithe and elastic frames, elevated features, and finely arched crania proclaim them of the pure blood of the desert, who

have carried Semitic art to its highest refinement, and developed a style that may well be regarded as the Mohammedan rival to the Christian Gothic.

But we have thus been brought to a test of race which Mr. Fergusson, in accordance with his scholastic training in ethnology, seems to utterly ignore—we mean organic type. It is from his neglect or ignorance of this that he has been led into his contradictions and absurdities respecting the Turanians. Had he possessed the slightest idea of the radical distinction between the Brachycephalic Mongol and the Dolichocephalic Negro, he would never have spoken of an African race as Turanian. Nor with the most rudimentary knowledge of what this epithet really means would he have applied it to the finely developed, oval-faced, and nervous traders of Tyre and Sidon. Such errors as those we have alluded to, however fatal to his speculations as an ethnologist, might indeed well be pardoned in one whose refined taste and profound knowledge in connection with his own majestic act, should effectually plead his excuse for lapses in every other. But our duty as the representatives of a scientific anthropology, and our loyalty to the truth, alike demand an unflinching exposure of the fallacies and absurdities of that school of pseudo-ethnology, whose disciples, guided by a few philological analogies and other scholastic data, have ventured to speak of the migrations and displacement of races with a confidence that would be simply ridiculous, were it not also seriously obstructive to the progress of sound knowledge. Let us clearly understand that man must be studied not simply in language, but in structure; and that in proportion as we neglect organic type we are on the certain road to error.

Mr. Fergusson is somewhat more at home with the Celts, perhaps because he knows them better; and had he spoken of them as he has done of the Turanians there would have been a much nearer approach to scientific truth than his work at present contains. To treat of the latter as especially susceptible of æsthetic culture is simply absurd; but in reference to the former the assertion is the embodiment of a great ethnic fact, of which history and archæology are alike demonstrative. If we enlarge the term, so as to make it embrace the classic nations of the south, as well as the Nervofibrous peoples of Western Europe, *fine* art may be said to constitute their especial appanage. The massive grandeur of the Egyptian style shows ideality laboriously and painfully struggling into manifestation, through the superincumbent pressure of a ponderous muscularity

of type, demanding a corresponding materiality of structure in its edifices. While in the architecture of India and the farther east, from the Buddhist and Jaina times to the epoch of the Mohammedan invasion, we see in the complexity and elaborateness of the decoration that toylike tendency which has ever characterized the smallheaded and nervous children of the Indus and the Ganges. That highest form of beauty, which demands only simplicity and purity, and that grandest phase of sublimity which depends on form and proportion rather than mass, were never seen in perfection till the Parthenon was placed on the Acropolis, and Phidias adorned it with the masterpieces of his genius.

The author's estimate of the Aryans has obviously been written from the English standpoint. Indeed he had better at once have called them Anglo-Saxons, for this is decidedly what he means. The gigantic practicability of the English mind, with which the world has been so superabundantly blessed within the last few generations, seems to have quite overmastered him; and he accordingly dwells with needlessly exaggerated force on the inductive and utilitarian tendencies of the plain speaking and common sense Aryans, who, unfortunately for the architectural world, have a most decided predilection for congregationalism and plain churches. Alas! indeed for the fine arts, wherever these hard-working, shipbuilding, road-making Aryans obtain the predominance. *Æsthetic* culture flies before them, while the viaduct supersedes the triumphal arch, and the whitewashed chapel takes the place of the gorgeous cathedral! No wonder Mr. Fergusson has slender faith in the art of the future. What indeed can be expected of a people wholly given up to spinning-jennies and power looms, and who prefer the profit derived from a red brick factory, with its smoking chimney, to all the unproductive glories of St. Peter's, and all the barren beauties of York Minster! What indeed is to become of mankind after the extinction of those great master builders, the Turanians, a catastrophe which it seems is more nearly impending than some soft-hearted philanthropists are willing to suppose, it is impossible to conceive. Our only hope will then be in the Celts, who are themselves, poor fellows! everywhere subordinated to these dreadful Aryans, to whom all edification, save that of making a fortune, is utterly abhorrent.

To be serious. Mr. Fergusson has mistaken the tendencies of an age for the characteristics of a race, and so attributed to the latter what is due solely to the former. Whether the Aryans proper erected temples in India or not, it is quite certain that the "Sanskrit speak-

ing" Greeks were the first artists in the world. And whether the English can or cannot erect tasteful and appropriate edifices now, it is demonstrable from existing remains, that they once enriched their country with abbeys and cathedrals, that are still the admiration of Christendom. Given a highly developed Caucasian race, richly endowed with creative power, susceptible to music, like the Germans, and capable of rising to the loftiest strains of dramatic and epic poetry like the English, and you have the elements out of which the purest and noblest art may at any time be evolved. But to nations as to individuals, there is a time for all things. We are the children of the inductive philosophy, and carried onward in the midway course of a materialistic and utilitarian era, we of necessity build steamships and construct railways; and as these are the best of their kind, so do they afford satisfactory evidence of a capacity, which wants but a higher and more spiritual inspiration to produce grander and more artistic results. When new temples are really wanted, that is when we have a living faith to put into them, Mr. Fergusson need not fear they will arise as by the wand of an enchanter, and cover the land with a grandeur and beauty of which no living artist has ever dreamed, and to which neither Grecian nor Gothic genius ever aspired.

Let us clearly understand this matter. Every style of architecture is but the manifestation of an idea; the temple is but the vesture of a faith. The stern power of the Osirian creed was befittingly reflected in the ponderous vastitude of Carnac. The grace and beauty of the Olympian deities, those glorious incarnations of all that is ideal and artistic in physical man and temporal life, found adequate expression in the harmonious proportions and faultless simplicity of a classic fane, that apt embodiment of finite thought and earthly aspiration; while the spiritual yearnings and heavenward tendencies of Christianity, with its overawing sense of the infinite and eternal, were befittingly mirrored in the dim vistas and far-stretching aisles, the lofty towers, and skyward pinnacles of a Gothic cathedral, that glorious symbol of the sublimity and severity, the grandeur and the gloom, of mediæval faith. Now, it is precisely because we lack a great inspiration of this kind that we have no architecture. We live under the eclipse of faith. Protestantism pulls down what Catholicism is too weak to build up. It is not among iconoclasts that true edification should be expected to prevail. It is on the flood tide of a new, not the ebb tide of an old creed, that humanity is borne to those altitudes of thought, where new and untried forms of beauty are revealed, as in beatific vision, to its rapt seers. From Britain

to Japan the world is in spiritual collapse. Everywhere the cry of desolation, the wail of despair, the groan of death, ascends from the deserted temple, whose priesthoods with difficulty repair the waste of time, and with failing hearts make a feeble show of resistance to their advancing and victorious foes. It is the twelfth hour of the night; and we must wait for the dawn, which will surely come, ere we can hope for the temple of humanity's glorious future, to become a realized fact among the things of time. In the interval we do well to reproduce classic or gothic piles, as temporal or spiritual occasions permit. Let us fully master the old, so perhaps shall we be better prepared to appreciate the new—when it is vouchsafed.

Let it not be supposed, from the rather severe tone of the foregoing remarks that we at all undervalue Mr. Fergusson's merits in his own department. As a writer on architecture his profound and extensive knowledge, combined with a naturally refined and cultured taste, eminently qualify him for his self-imposed task as the historian of the past, and the critic, if not the guide, of the present. But in venturing on ethnology he has entered on a domain of thought and knowledge for which his previous studies have but very imperfectly prepared him; and as a result, his remarks, however startling and ingenious, are utterly devoid of all scientific value, being based throughout on those misapprehensions which ever attach to the opinions of those who write on a subject which they have but imperfectly mastered. Let him not, however, despair even ethnologically. His superior talents, and vast attainments in his own particular sphere, may yet prove of immense service to anthropological science. We want his aid. There is an immense field of inquiry, where the properly qualified architect and engineer can alone efficiently aid us. We allude to the vast province of archæology. We want from the latter, both in his civil and military capacity, a careful survey and skilful restoration, both in plan and pictorial outline, of the great earthworks of the primæval and prearchitectural periods. We want him to afford us an estimate of the labour required, and the means employed for the effectuation of these stupendous remains of a prehistoric civilization. While from the former we need a similar restoration of all the more important architectural efforts of various ages and countries. Such a work might commence with the monolith and cromlech of the North-west of Europe and Southern India. Its second division should fully illustrate Cyclopean architecture in its successive stages, wherever found, whether around the Mediterranean area of the old, or amidst the tropical altitudes of the

new world. Its third chapter might embrace pyramidal erections, from the grandly sublime and finished masses of the Nile to the ruder teocallis of Mexico. Its fourth might be appropriately devoted to those caverned temples, where the taste and skill of early ages have stamped their lasting imprints on the living rock. And from this, emerging into architecture proper, we might, at a glance, survey the successive styles which have prevailed under Egyptian, Indian, Assyrian, Etruscan, Classic, Saracenic, and Gothic culture. For such a work Mr. Fergusson has peculiar qualifications. The materials must be largely in his possession, and in his Handbook of Architecture he has already approached to the fulfilment of the latter part of the idea. Thus, by a judicious application of the results of a life of study in his own branch, rather than by crude speculations on ethnology, to which he is incompetent, can he best serve the great science of man, and help us ultimately to some definite conclusions as to the effect of race on art.

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## CREATION OF MAN, AND SUBSTANCE OF THE MIND.\*

BY PROFESSOR RUDOLPH WAGNER.†

It was with some hesitation that I yielded to the repeated request of your worthy Secretary to deliver this address, a request backed by several eminent members. My friends were of opinion that a resident of this town, which you have honoured with your presence, should deliver the inaugural address, on some general scientific subject.

I have selected the science of man, that is anthropology, in its physical and psychical aspect, or rather a mere section of it, which, if I must give a name to my discourse, I shall term "Creation of Man and Substance of the Mind."

\* An Anthropological Lecture, delivered at the first public meeting of the Thirty-First Assembly of German Naturalists and Physicians at Goettingen, Sept. 1854, by Professor Wagner of Goettingen.

† Several passages touching on the supposed connection of the science of Man with historical Christianity and Revelation have not been translated, as these subjects have nothing to do with Anthropology. EDITOR.

I trust you will not find the subject without interest. Whether the mode in which I have treated it will please you is a different question. There is also a local cause which led me to select this subject.

Physical anthropology, the natural history of the human species, had its scientific cradle within the walls of this city. The house (now devoted to a benevolent object) is still standing in which the man, from a few fragments which his grateful pupils sent him from all parts of the world, laid the foundations of a new branch of human science, which connects the natural history of our species with the history of the universe. Some of those present personally knew that man, and the documents upon which he founded his studies are preserved to our University, by the liberality of our government.

Blumenbach's style was so popular that the results of his investigations have become common property of all educated persons. His fundamental principles with regard to the natural connection and diversities of the nations on the globe are introduced in all our schoolbooks.

There is, however, one question which I wish specially to discuss, which is, whether certain dogmas touching the original relationship of the varieties of mankind have been confirmed by the enlargement of our ethnographical knowledge.

Let us glance at certain results, which I shall sum up in seven axioms.

**Axiom 1.** All physical differences presented by the various nations on the globe are not greater than the diversities presented by animals and plants of the same species, and which differences, *e. g.* in the dog and sheep, we term varieties.

All the facts collected since Blumenbach's first investigations, that is during the last eighty years, tend to confirm that axiom.

**Axiom 2.** The varieties of the human species consist, (a) of accidental varieties, *e. g.* albinos, owing to absence of pigment, occurring among all peoples, many mammals, and birds. (b) Climatic varieties, exhibiting the influence of climate in the colour of the skin, stature, etc. (c) So called *permanent* varieties, or *races*.

**Axiom 3.** The determination of the number of such races is, to a certain extent, arbitrary, depending on the degree of deviation which is considered requisite to constitute a separate race. Blumenbach, as is known, assumed five races, which on the whole correspond with the five parts of the world. With singular tact, he described the four continental races, or according to colour, the white, the

yellow, the black, and the red race. We may even retain Blumenbach's fifth race, the brown or Malay race, if we add as a sixth race the lank-haired race of New Holland, and add the Papuan as a seventh race, whilst we include the wool-haired negroes of the seacoast in the continental negroes. Linguistic investigations have since then established the remarkable fact that the great groups of languages appear to run parallel with the development of races.

**Axiom 4.** All races of mankind intermix; they are fertile, producing cross breeds, mulattoes, mestizoes, etc., which again are productive. All human races constitute, therefore, on physiological principles, but one species, which is here identical with *genus humanum*.

This latter axiom is now an undoubted consequence of the physiology of generation. It is established that only animals of the same species are fertile. Animals of different species may interbreed under particular, generally artificial conditions, but the offspring is sterile. This all-pervading law is necessary, for the historical existence of the various species.

**Axiom 5.** Historical documents, mummies, and sub-fossil human skeletons prove that man has not undergone any material changes in form or stature; and geology has also proved that man appeared last.

To these five axioms we may add a sixth and a seventh, which I will put in the form of two questions, which are certainly the most interesting in the science of man.

Can all human races be reduced to one original type, and if so, how have the varieties originated? And again, can we, from natural causes, assume or deduce that they have descended from a single pair? You will admit that an affirmative answer to these questions, founded on science alone, irrespective of tradition, would be of the greatest importance.

Blumenbach adhered to the principle that all men were but varieties of one species, and he arrived at the result that there exists no sufficient scientific reason against the descent of these varieties from one and the same original stock. All races, he declares, run so much into each other, by so many gradations that only arbitrary limits can be given to each race.

This theory of Blumenbach has been much attacked, and a number of eminent naturalists, who have made this subject their special study, have arrived at the conviction that there must have been originally different stocks, and that the negroes and some other chief races had

their own Adams and Paradises; a result which no doubt appeared highly satisfactory to slaveholders. With regard to the number of these original pairs authors are much divided.

They have first assumed five Adams, corresponding with Blumenbach's five races; and subsequently extended the series to fifteen or sixteen Adams.

If you ask me on my scientific conscience, quite irrespective of my religious convictions, how I would formulate the final results of my investigations on this subject, I should do so in the following manner:—All races of mankind can (like the races of many domestic animals) be reduced to one original existing, but only to an ideal type, to which the Indo-European type approached nearest. The mode by which races have been formed is perfectly unknown. It reaches back in a primordial time, perfectly inaccessible to science.

Whether all human beings descended from one pair can be as little proved by scientific data as the contrary theory; and in this respect theology can derive no assistance from natural science. Still the *possibility* of descent from one pair cannot, on physiological principles, be disputed. We see with our own eyes, in some colonies, physiological characters arise in men and animals which apparently become permanent, and exhibit certainly some analogy to the formation of races.

This is, if you like to take it so, my scientific confession of faith, as regards this interesting question, in which neither historical investigation nor anthropology, combined with geology, rest on a firm support, but are lost in an inaccessible depth.

I now turn from the physical to the psychical aspect of the question.

Has physiology, which investigates the vital process of the individual, also occupied itself with the question what becomes of that individual after death, or what is tantamount, has this science which has made such progress, spoken out plainly on the nature of the soul?

Not all physiologists have ventured to touch this question; and if they have done so, they have either, on account of the difficulty of the subject or from other considerations, avoided to speak out plainly. Still, gradually, they have more and more encroached on a province which has hitherto been abandoned to philosophy and theology. Materialistic views have gained ground among naturalists, and specially among physiologists the belief in a substantial soul gradually diminishes, and the attempt to fuse psychology with natural science seems to be for him who can read the signs of the times the present problem. Though men perfectly acquainted with the present state of

our knowledge have pronounced against materialism, they do not deny, to use the words of an eminent philosopher now present, "that materialistic theories, which existed at all times, have in recent times been greatly encouraged by the progress of natural science." The great progress of these materialistic opinions induces us to investigate the chief arguments produced.

I select for this purpose some passages from the second edition of a work by a well-known and highly-gifted author. In his chapter on the functions of the nervous system and mental life, he says:—

"The seat of consciousness, of the will, is solely to be found in the brain. To assume the existence of a soul which uses the brain as an instrument with which it can work at pleasure is pure nonsense." . . . . "All mental activity ceases with death." . . . . "Physiology thus decidedly and categorically declares against individual immortality, and against all notions which attach themselves to the special existence of a soul. Physiology is not only entitled to treat these questions, but it has been justly reproached for not having touched them sooner, in order to point out the proper way for the solution of these questions. It has been stated that physiology advances beyond her province in investigating psychical phenomena, but it must study the functions of this substratum; and whatever physiology considers as such functions, must necessarily form the subject of her investigation."

This author, after citing the opinions of three eminent German anatomists and physiologists, concludes thus:

"With regard to myself, I can only say that every naturalist, if he thinks logically, must come to the same conclusions. I will not, however, deny that there are idiotic and obtuse naturalists."

Among the three physiologists cited by that author, there is one who honours us this day by his presence, and whom I had the pleasure of counting among my pupils, who has some reason to complain. The views which he expressed appear to me to have been much more restricted and more prudently expressed than to warrant his being so summarily counted among the adherents of materialism. One thing must be readily admitted, our author speaks clearly and plainly; we cannot complain of his equivocation. This honesty is praiseworthy. He gives an unvarnished answer to a delicate question. The consequences which are drawn from them are equally of remarkable simplicity. Our moralists, our theologians, our lawyers, will henceforth have a very easy office. "For," says the learned author in another work, "free will does not exist, and consequently no responsibility

and accountability such as moral or criminal jurisprudence would impose upon us. We are at no time masters of ourselves—of our intellectual faculties;—as little as we are masters that our kidneys should secrete or not secrete.”

Thus, all the grand thoughts which the deepest philosophical investigators have acknowledged, which has inspired whole generations, are idle dreams, phantasms of biped mechanisms which run about on the surface, then become skeletons, are finally resolved into atoms, which are again combined, become again human forms, commence again their sphere of action, not unlike the dancing of lunatics in a madhouse. They have no future, no moral basis, no faith in a moral code.

It is the province of three great sections of this assembly to occupy themselves seriously with the question regarding the nature of the soul and its connexion with the body. I would, therefore, both in the interest of men of science and laymen, ask you:—

Do you think science is sufficiently advanced to decide the question on the nature of the soul? And if so, are you inclined to adopt the opinion of those who deny an independent individual soul?

These questions are plainly and clearly formulated. May your answer, whatever it be, be equally so. Half-and-half answers are unworthy of a scientific free thinker.

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### PICTET ON THE ARYAN RACE.\*

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WHEN the great philological discovery of modern times was made, that all the languages of Europe, with a few exceptions, were sprung from one common tongue, most nearly represented by the ancient sacred language of India, the study of the branches sprung from this now extinct parent language became a matter of the highest moment to Ethnologists. For though it would not be sound reasoning to make language an absolute test of race, and to take away, for instance, the Cornishman from his connexion with the Welshman and plant him among the Saxons whose language he has adopted, or to say off-

\* *Les Origines Indo-Européennes, ou les Aryas Primitifs, Essai de Paléontologie Linguistique*, par Adolphe Pictet. Paris: Cherbuliez, 1859-63.

hand, whenever we find a race of people speaking an Aryan dialect as the native tongue of their ancestors and themselves, that these people must be pure and direct descendants of a race who were ages ago the only speakers of a yet undivided Aryan speech, it is nevertheless true that such evidence is capable of giving us what is generally the most important element in the history of such a race. The evidence of language does prove beyond controversy, that the early race, which we call the Aryan, did once exist, and that, pouring itself out East and West in many waves of migration, it settled itself over almost all Europe and part of Asia. Partly by destroying or expelling the previous inhabitants, partly by taking them up into itself by intermarriage, and partly by thrusting itself among them as a dominant class, it covered this great part of the Map of the World with a collection of nations more or less purely Aryan in blood, but in language, mythology, laws, and customs, so deeply impregnated with Aryan influences, that even where the physiologist may refuse to recognise a family tie of full blood-relationship, the student of human civilization may be content to let education fill up the gaps left by blood, and to accept them as a whole under the popular name of the Aryan race.

This being admitted, there arise a series of important and interesting questions, which are to be solved more or less fully, upon philological evidence. What manner of people was this Aryan race before its division into the tribes, whose children, born or adopted, are known to us as Greeks, Celts, Persians, and so forth; what were their manners and customs, their knowledge of nature and the arts? How much of what we call the civilization of these great races was derived from their common parentage, and how much is the result of independent development after their separation from the parent stock, or of communication with other races, whether Aryan or not? And in what order did these branches of the race leave their original home, and how and when did they come to be subdivided into nations who have long forgotten their connection, not only with the original race, but even with the other members of the subordinate division of it from which they sprang?

Until M. Pictet's great work was published, the answers to these questions have been miserably fragmentary. Detached portions of them had indeed been worked out with great ingenuity and labour, but no comprehensive view of the whole subject was accessible to the student of Ethnology. The object of M. Pictet's book, the first part of which appeared in 1859, and the second concluding part lately, is to classify and compare the many languages of our Aryan family with

a view of answering as far as may be the questions of this kind which present themselves. The world ought to be grateful to the author for the mass of systematically arranged material and ingenious deduction which he has now for the first time laid before the student, and of which it is our object to give a short summary.

It is, however, necessary to make a remark on M. Pictet's method of reasoning, not in a spirit of captious fault-finding, but simply to warn ethnologists that the results brought forward are not always to be received unhesitatingly as established facts. A generation or so ago, when Sanskrit had just been discovered and partially explored, and its enormous value in restoring and completing the etymology and grammatical structure of our European languages was beginning to be recognised, it is not surprising that philologists should have run sometimes into extreme opinions as to the range of its application, and have been tempted to explain the origin of any doubtful word by rushing to the list of Sanskrit verb roots, and referring it without more ado to the root that came nearest to it in sound and signification. Had the Sanskrit roots given in the lists of the Indian grammarians been always to be depended upon as really having existed and borne the meanings assigned to them, this method would still have been unsafe, but it is clear that many of them are but figments of the ancient native philologists. These Indian grammarians, finding how large a proportion of the language was capable of being referred to verb-roots or dhatus really existing as verbs, tried to bring everything, or almost everything, down to similar elements, without making due allowance for the breaking down, confusion, and alteration of meaning inseparable from the very existence of a language which had emerged to a considerable extent from the genetic stage. To the undoubted root-forms of the Sanskrit the grammarians thus added, for etymological purposes, a great number of imaginary ones, sometimes real restorations of root-words which had fallen out of common use, but more often containing a partial and distorted view of a real root, or even entirely wide of the mark. When European philologists had got over the first exhilaration of discovery and settled the general connexion of the European languages with Sanskrit on a firm basis, it became the business of a school of laborious and exact Sanskrit scholars to test everything by existing Sanskrit texts, excluding all grammatical imaginations, and rather choosing to give up the prettiest and most plausible etymologies of European languages from the Sanskrit, than to found a derivation of a Greek or German or Celtic word on a verb-root, which might have never had more than a subjective existence

in the brain of some Indian Pandit. As a rough-and-ready illustration of the way in which these roots were sometimes made, we may imagine an etymologist arguing, that as *carrier* belongs to a verb to *carry*, so *cottier* should belong to a verb to *cotty*, with a sense of cultivating, or somewhat of the kind; or catching at the verb to *horse*,—"he horsed the Epping stage,"—and erecting it to the dignity of an original verb to which the substantive *horse* should be subordinate.

M. Pictet is one of the oldest and most successful workers in the field of Aryan philology; so that it is not to be wondered at that he should accept and reason on the roots catalogued by the Indian philologists with more confidence than the new Sanskrit purists consider justifiable, and he is therefore often at issue with them. It is difficult, therefore, for the student, who consults the work before us with a view to ethnological rather than philological results, to feel always quite sure of his ground.

A quaint old theory once obtained among doctors, that wherever a particular disease was prevalent, there nature always planted a suitable remedy. If stinging-nettles abounded, there was dock close by to cure the sting; if the ague were prevalent, there in the marshy ground grew the willow-bark to cure it. In the present case the old rule holds good. The great St. Petersburg dictionary of Boehtlingk and Roth is already about half done, by means of which it is possible to know at once whether a supposed root is safe or not to be used for etymological purposes. And Professor Schleicher's *Compendium of the Comparative Grammar of the Indo-German Languages\** now enables the ordinary student to trace with little difficulty the modifications which vowels and consonants pass through in regular course in the various languages of the Aryan race, and to be able to stop any etymology which does not conform to the usual rules; and if it cannot produce strong evidence of its parentage, to reject it altogether or mark it as mere hypothesis.

The first book of M. Pictet's work starts on slippery ground. The task of comparing names of races and ascertaining their meaning is one in which certainty is hardly to be attained at any cost of labour and skill. That the connexion between the 'Aptoi, Iran, and Ireland is a real one, and that the name of Aryan which we give to the whole Indo-European family is a justifiable one, is an opinion very generally held. If the name is really a common one, what does it

\* *Compendium der Vergleichenden Grammatik der Indo-Germanischen Sprachen.* Von August Schleicher. Weimar: Böhlau. London: Williams and Norgate, 1861-2.

mean? *Arya* means in Sanskrit a *master* or *lord*, also *excellent*; and *ârya* is a term used for men of pure race, of the dominant class. Or has the name of the race to do with the root-verb *ar*, to plough, Latin *arare*, English to *ear*, as distinguishing the Aryan race, as cultivators of the soil, from the Turanian or nomade races? Or is it something else, equally plausible, and equally uncertain. *Quien sabe?*

Where was the first home of the Aryan race? M. Pictet thinks in Bactria, or thereabouts, and gives his reasons, mostly founded on the *Zendavesta*, going afterwards into the vexed questions of the order in which the different peoples, Slaves, Celts, and so forth, left the original home of the race, and the routes they followed.

The existence of the word *barbarian*, βαρβαρον, in Sanskrit literature of a tolerably early date as *barbara*, leads our author to believe that the Aryans, before the Greeks had gone off on their westward migration, applied this term, founded on an imitation of a confused and unintelligible sound, like *murmur*, to the surrounding tribes, who of course appeared to them, as foreigners do now to persons deficient in linguistic knowledge, as people "of a stammering tongue." He quotes in this connection, though without positively accepting it, an etymology of *Welsh* now usually admitted, connecting it with another onomatopœic Sanskrit root, *mlec'ch*, to speak confusedly or in a barbarous tongue. This word resembles, though but in a loose way, the names equivalent to *Welsh*, which, with the sense of foreign or barbarous, have been given by several nations to their neighbours whose speech was unintelligible to them; as by the Slave to the Wallachian (*Wlach*), by the German to the Italian (*Wälsch*), and by ourselves to the *Cymry*.

After this comes a discussion of the connexion between, or rather of the unity of, the *Yavanas* of Sanskrit literature with the Ionians or *Ἴάονες* and the children of *Javan*. Then follow other nations with similar names, the Iberians of Spain and of the Caucasus, the *Getæ* and the *Goths*, the *Dacians* and the *Danes*, the *Sacæ* and the *Saxons*. But this bringing together distant races on the strength of a resemblance between their names is very dangerous work, as any dispassionate student, when he has read Jacob Grimm's argument on these subjects in his *History of the German Language*, may judge for himself. It is a relief to come out into a clearer atmosphere, and to follow M. Pictet into his discussion of the names given by the different members of the Aryan race to some of the phenomena of nature.

The Aryans seem before their division to have divided the year into three seasons—winter, spring, and summer; while, as autumn is

known in the different countries inhabited by our race by entirely different names, it follows that it was not originally recognized as a separate season. The best series of common names are those belonging to winter and the phenomena belonging to it, as *hiems*, *χείμα*, Slavonic *zima*, which are connected with Sanskrit *hima*, cold, snow, whence Himalaya, *the abode of snow*. The hypothetical derivation of hibernus as hi-bernus, with the sense of snow-bearing, hi being an imaginary relative of hima, and the rest of the word, from the verb *bhar*, to bear, is ingenious, but wanting in collateral evidence. For the verb to *snow* we have Zend *gniz*, Lithuanian *snigti*, Anglo-Saxon *snivan*, Latin *ningere* (with the *s* dropped), etc.; while against Sanskrit *g'ala*, cold, we have *gelo*, *gelu*, our words *cold* and *cool*, with their earlier relatives in Gothic—*kalds*, Anglo-Saxon—*ceald*, etc., with Russian *goloti*, ice, and various others.

Spring does not go so easily and well in this comparison as winter; but M. Pictet's comparison of Sanskrit *vasanta*, with Slavonic *vesna*, Latin *ver*, Scandinavian *vår*, Greek  $\vartheta\eta\rho$  (for  $\text{F}\eta\rho$ ,) etc., seems to indicate a radical connexion among these words. Among the various etymologies of the Sanskrit *vasanta*, spring, he inclines to deduce it from the root *vas*, to clothe (whence *vestire*), as being the season in which the earth is carpeted or clothed with verdure. Such an epithet would be most appropriate, and we may suggest a similar name given by the ancient Peruvians to one of their months, *paucar-hauray*, or "meadow-carpet." The words by which summer is known are connected, as is natural, with heat and the sun.

The evidences we possess as to the original site of the Aryan race have led most inquirers to a belief in their having been settled, and having developed themselves into the state in which we get the first dim view of them, in the interior of Asia, separated by immense geographical barriers from the oceans of the north and south. The question whether they knew of the sea becomes, therefore, a very interesting one, and it may, in a certain sense, be answered in the affirmative. The word *mare* is no isolated word, for words more or less closely related to it are found through all our Aryan languages in Europe, except Greek, in Welsh *môr*, Gothic *marei*, Ags. *mere*, and so on; and these words our author connects with Sanskrit *mîtra*, ocean, and etymologically with the root *mr*, to die, Latin *mori*, as being in another form the desert, lifeless, *vastum mare*, the desert itself being called *maru* in Sanskrit, and the same name being applied to mountains, as a rule wild and desolate places, in full correspondence with which may be adduced our word *moor*, old German *muor*, a marsh,

etc., etc. Without objecting to this, or contradicting M. Pictet's view that the sea our ancestors knew in their early home was the Caspian, we must protest against the argument that, as a sandy desert lies between Bactria and the Caspian, the desert and the sea would be naturally confounded in the Aryan mind. "It is, then, very probable that *maru*, and perhaps also *mira*, designated all the western region, including the Caspian Sea, which was only its continuation."

With the same desire to make evidence, he adduces the Indian name for the west, *varunî*, as being the region of the sea, *varuna*; and argues that as the ocean should be the south, not the west, to the inhabitants of India, the name may be a recollection of the old time when they lived farther up in the interior of the continent, and had the Caspian at their west. But, to say no more, *varuna* is a general term for an expanse, which may be the sea, but which is also the firmament of heaven, 'Oupavós.

At p. 118 are some very suggestive remarks on the German word *Sünd-fluth*, literally "Sin-flood," the deluge, which philologists have so often referred to as an example of the way in which the popular mind insists on thrusting a sense satisfactory to itself into words which it does not understand. The old German *sint-fluot*, of which *sünd-fluth* is a corruption, has certainly nothing about sin in it. M. Pictet explains it as corresponding to an imaginary Sanskrit compound, *sindhupluta*, of which the latter part is our word flood; while *sindhu*, sea or river, is in the latter sense a familiar name to us in its different modifications—*Sindh*, *Hindo-stan*, *Indus*, *India*. The old word *sint-fluot*, connected with the diluvial tradition which the Aryan race possesses in a different form to the Semitic race, should, if this etymology prove sound, mean simply "the sea-flood."

It is impossible in so short a space to give even a summary of all the subjects which are treated upon in the work, and we pass over the designations of stone and rock, valley and river, to the department of natural history, which begins with the names of metals, and the historical arguments to be founded on them.

A certain knowledge of the metals which were known to the different branches of our race at the time of their separation would be important, as showing the relative state of their civilization, but there are great difficulties in arriving at this. In the first place, the names of metals naturally travel from one country to another with the metals themselves; so that we are liable to take a lately-imported word for one derived by hereditary descent from the common stock; and, moreover, different metals have very frequently been confounded

under the same names. Passing over the names of compound metals, such as *brass* and *bronze*, which are merely varieties of one word, we have a name of iron, *σίδηρος*, so like the names of *silver*, Gothic *silubr*, Lithuanian *sidábras*, that a common sense, apparently that of whiteness or brilliancy, probably belongs to both, as the meaning of shining does to the Sanskrit words *rag'ata* and *rag'ant*, both from the root *rag'*, to shine, signifying one silver, and the other gold. The etymological connection between *æs*, *æris*, and *iron*, Gothic *eisarn*, which has been maintained by eminent authorities, is denied by M. Pictet. His conclusions on the subject of metals are, that the Aryans were acquainted with gold and silver, iron, copper, and bronze (which compound metal necessarily involves a knowledge of tin), though for tin itself linguistic evidence fails. To this list must be added lead, which our author considers them to have been acquainted with, though the evidence from language is of the weakest possible description. Apropos of this metal he reasons, that as it does not alloy with copper, and would be of little use for weapons, etc., by itself, it may have been considered as worthless; so that its original names may have been forgotten by the migrating tribes, until they came to know its uses, when they named it afresh. The statement that lead does not alloy with copper is not, however, technically correct. Such an alloy not only exists, but is largely used in England, under the name of "pot metal."

Passing to the consideration of the trees known to the Aryans, we find a confusion of names like those just noticed among metals, between two trees with edible fruit, the *beech*, *fagus*, and the oak with eatable acorns, in Persian *bák*, Greek *φηγός*, which names being derived probably from the root *bhag'*, to eat, *φάγω*, are as applicable to the one tree as the other; so that the fact of this name being widely spread among the various branches of our race does not lead to a clear result. Nor does it seem possible to trace by clear evidence of language any of the wild trees of Europe, with one exception, back to the epoch before the separation, though among their names are to be found a number of very wide-lying analogies, as in the names of the poplar, willow, etc. The exception is the *birch*, Sanskrit *bhúrg'a*, Russian *bereza*, Anglo-Saxon *beorc*, etc. It is, at least, M. Pictet's opinion that this reasoning is safe; and he even suggests the very natural derivation of these various names from the various equivalents of the word *bark*, the birch being distinguished by its soft and flexible bark, which is used for various purposes. It is to be remarked, however, that *bhúrg'a* does not admit of any direct explanation in Sanskrit.

The philological information as to the fruit-trees known to the Aryan race, is of the same scanty and doubtful character as that which relates to forest trees. Even where a name is common to several branches of the race, it is only partially possible to distinguish between words belonging radically to the language in question and words received from other races, together with the products they refer to; and, moreover, the names of many of them are very indefinite, as, for instance, that of *nut*, which is common to the Latin, Germanic, and Celtic languages, with phonetic variations, which show it is not a borrowed word. Its probable etymology connects it with *knot*, but there are so many kinds of nuts that the existence of a common name, even if it ran through every language of the race, would give us no information as to the kind of nut eaten by the Aryans, and would indeed tell us little more than the existence of common words for *tree* or *fruit*.

The difficult question whether the grape-vine and wine were known to the ancient Aryans is decided very confidently in the affirmative; but whether students will be thoroughly persuaded by the train of reasoning is another matter. It is one of the most puzzling questions which arise, in attempting to trace history by the aid of words, which may be applied to many different things. The Greek *μέθυ*, wine, English *mead*, in connection with the Sanskrit *madhu*, sweet, gives no information as to the material of which the drink was made, which is just what we want to know. The etymologies of *must*, from Sanskrit *mud*, to be intoxicated, and of *wine*, from Sanskrit *vena*, delightful, a term used for the sacred Soma-liquor, whether they are right or wrong, still tell us of nothing but intoxicating liquor in a general way, but nothing about the materials of which it is made. Moreover, the way in which words for one drink travel over the world, to be applied to others of a different nature, is well known. The name of *toddy*, that is, palm-wine, has gone into the uttermost parts of the earth as a designation for spirits and water; and *arrack* has a special meaning in England, which does not belong exclusively to it, as *arak* is used in Persia, etc., for spirituous liquors in general. The resemblance between Sanskrit *rasâ*, Greek *ῥάξ*, Latin *racemus* (whence *raisin*, etc.), is certainly strong; but we think that the Ethnologist, whose general rule, in arguing upon the results obtained by the Philologist, ought to be "certainty or nothing," will prefer to leave the question open, to accepting on the evidence adduced, the conclusion that the ancient Aryans had vines, and made wine of the grapes.

The names of the different kinds of grain present the same kind of indefiniteness that belongs to fermented liquors and fruits. General terms, derived, like *corn*, or *grain*, or *triticum*, from the notion of grinding, or the like; or the words *froment*, from *frumentum*, *frui*, and *oats*, Anglo-Saxon *ata*, Sanskrit *ad*, to *eat*, tell us nothing as to particular species or varieties of grain. The meanings of such words shift with circumstances. The word *corn*, for instance, which means wheat in England, is always used for maize in the United States. Of course the cultivation of grain by the early Aryans is an acknowledged fact, proved by a mass of evidence; but the particular kinds of grain which they cultivated are, and perhaps always will be, somewhat doubtful. Some of the evidence which M. Pictet has to offer, as to details, is as follows:—

In Sanskrit, wheat is known as *mlec'c'hâça*, *mlec'c'habhog'ana*, that is to say, food of the barbarians. Such a name seems, at first sight, to argue that the Indians did not possess this grain, and that it was not known to the ancient Aryans; but the difficulty is removed by the consideration that the centre and south of India are too hot for wheat to flourish, while in the north, in the regions of the barbarians, the climate suits it. When the Indian branch of the Aryans descended into the warm regions they now occupy, they would naturally drop the cultivation of wheat. The name of *wheat* is no doubt from its being the *white* grain, but its name is often confused with that of barley, so that, though it is probable that the Aryan race may have cultivated both wheat and barley, the philologist alone cannot prove this, and must call in the aid of the botanist. The name of *rye* is a striking example of this indefiniteness in the names of different kinds of grain, and M. Pictet goes into an elaborate comparison of terms in support of the view that *rye*, Anglo-Saxon *ryge*, Polish *rez*, Thracian *βριζα*, is the same word as *rice*, Polish *ryz*, Greek *δρυζα*, the whole being referred to Sanskrit *vrihi*—a name which is applied to rice, and involves merely the idea of *growing*. The case seems satisfactorily made out that the names for these two different grains are the same, and that in all probability the Indian branch, when they came down into a rice-growing country, applied to this grain their old name for rye, but the proof has the effect to our minds of sweeping away the last vestige of certainty in tracing the cultivation of any particular grain back to a remote period and a distant country, by purely linguistic evidence. The name of the *pea*, Latin *pisum*, is found in Sanskrit as *peçi*, and its etymology involves, probably, the sense of *pounding*.

We pass over a number of other plants, respecting which, M.

Pictet has collected most valuable information. It is evident that the subject has not been yet brought into a state fit for the use of the ethnologist, though we are by no means prepared to offer a contradiction of our author's view that the plants, wild and cultivated, whose names go back to Aryan origin, all belong to a flora which can only have subsisted in a temperate region, and which has a generally European character.

Fortunately, the specific characters of animals are much more definitely distinguished by their names than those of plants, and the study of the names of domestic and wild creatures, even down to small insects, will suffice to give a general view of the fauna of the region inhabited by our race before its separation. Setting aside questions of varieties, the ox, horse, sheep, goat, pig, dog, were undoubtedly known by them, while there seems no direct proof of their having domesticated the ass and the cat. We can do no more than allude to M. Pictet's remarks on the names of the camel. The existence of a German name, resembling that of the *elephant* but applied up to mediæval times to the *camel*, is a curious phenomenon, which has attracted much attention. The Gothic *ulbandus*, Old German *olpenta*, Anglo-Saxon *olfand*, are all terms for the camel, and the coincidence has usually been thought an excellent example of the way in which the popular mind might confuse the names of two great beasts of distant countries. Our author takes *velibādu*, the ancient Slavonic name of the camel, to be a name explainable in Sanskrit, as *vala-bandha*, big-body, and apparently not the same word as *elephant*.

The domestication of poultry, as M. Pictet remarks, belongs to an advanced state of civilization. The name of the goose is one of the best examples of the name of an animal running through the whole of the Aryan languages, Sanskrit *hañsa* (the laughter), Old German *kans*, Anglo-Saxon *gos*, Scandinavian *gås*. The Greek  $\chi\eta\nu$  has lost the final sibilant, and Latin *anser* probably the initial aspirate, and there are a score of other equivalents in the languages of Europe and Asia. The names of the swan and duck are sometimes confused with that of the goose. An objection might be raised to M. Pictet's argument, that though very early records show the goose domesticated in Greece and India, and there is very strong ground for believing that the Aryans had it in a domesticated state before the separation, yet various species of geese are found wild over Europe and Asia, and the common name makes no distinction between a wild goose and a tame one. The same remark applies yet more forcibly to the duck.

M. Pictet, considering the *cock* to be descended from the Himalayan species, argues that the ancient Aryans had it domesticated in their poultry-yards, though in early times the Greeks seem not to have been acquainted with it. Its name is an imitation of its cry, Sanskrit *kukkuta*, Slavonic *kokoshu*, Anglo-Saxon *cocc*, similar names being applied to very different birds, as Lithuanian *kukuttis* to the hoopoe, French *cocotte*, a very general name applied to the parrot, and English *cockatoo*. To Skr. *kánuka*, Persian *kanak*, belong Gothic *hana*, German *hahn*, of which we have only the feminine form in *hen*, and their meaning is "the singer", Skr. *kan*, Latin *canere*, while *gallus*, Persian *gál*, has a similar origin.

The *bee* and *honey* were well known to the Aryan race, but evidence fails to prove the existence of the art of bee-keeping.

The *mouse* is called in Sanskrit *músha*, that is to say, "the thief," from *mush*, to steal, and the name goes through almost the whole circle of the Aryan languages, Greek *μῦς*, Latin *mus*, Slavonic *mysi*, etc. The *flea*, Latin *pulex*, Anglo-Saxon *flæh* is referred to Skr. *pulaka*, which has the general sense of parasitic insect and a derivation from the root *pul*, to swarm. The name of the fly, Sanskrit *máshiká*, Latin *musca* (whence *mosquito*), Greek *μύια*, German *mücke*, English *midge*, includes several insects, to which the derivation from the root *maç*, to sound, as being humming insects, is more or less applicable.

The similarity of the Hebrew name of the *lion*, *levi*, *lavia*, with *leo*, etc., makes it a difficult matter to know whether we are to refer both to one origin or not, and Coptic *laboi*, used both for bear and lion, makes the question still more perplexed. Our author considers the European name of the king of beasts, Latin *leo*, Greek *λέων*, Old German *lewo*, Slavonic *livu*, Lithuanian *lutas*, as genuine Aryan words connected with the root *lú*, to tear, or destroy. The lion existed in Thrace, etc., up to a comparatively late period, and M. Pictet makes the not improbable suggestion that the Cave-Lion was still living in Central Europe at and after the arrival of the divisions of the Aryan race. With the bear, there is of course no difficulty in considering its name to be lineally descended from that in use in Bactria, or wherever the Aryans may have lived in Central Asia. The Sanskrit *raksha*, Greek *ἄρκτος*, *ἄρκτος*, Latin *ursus*, are clearly allied. The wolf and the fox, whose names are sometimes confounded, infested the flocks and farm-yards of the Aryans.

M. Pictet refers the name of the badger, Latin *taxus*, Italian *tasso*, German *dachs*, to the Sanskrit root *taksh* as being "the cutter," and

accounts for the mention of skins of *tachash*, translated "badgers' skins" in the Book of Numbers, as having come by commerce with Persia, and attaches more certainty to this conclusion than seems at all prudent.

The *otter* is an animal whose name, Greek *ἐνυδρίς*, Lithuanian *udra*, is clearly significant of its living in the water, and allied to Sanskrit *udra* and to the root *ud*, to *wet*; but this word, as its sense allows, is used also for the crab; while in Zend the meaning of *udra* is in like manner doubtful between the otter and the beaver, to both of which it is equally applicable. The name of the beaver, found almost throughout Europe, as in Latin *fiber*, Anglo-Saxon, *beofer*, Lithuanian *bebrus*, etc., appears to be an Aryan word transferred from other animals, or at least belonging indefinitely to several, as in Sanskrit *babhru*, rat and ichneumon, Persian *bībar*, mouse. Its meaning is apparently "the brown animal." The *hare*, German *hase*, Sanskrit *ṛaṣa*, is "the leaper;" while Greek *λαγῶς* is compared with the Sanskrit root *lagh*, transilire, and *laghu*, light, swift. The rabbit, or *coney*, Latin *cuniculus*, belongs to the verb *khan*, to dig, whence *canal*, etc., names derived from which are also applied in Sanskrit to the rat, and in Russian, etc., to the marten, from their burrowing habits.

The name of the crow, Sanskrit *kāra*, is of great philological interest. In Sanskrit a number of words are formed by prefixing the interrogative particles *ka*, *kat*, *ku*, etc., to nouns with a sense of depreciation. The name of the crow is thus derived from *ka-āra*—"what a voice!" This formation is common enough, as in such instances as *kad-adhvan*, a bad street, literally "what a street!" and *ku-vanga*, lead, literally "what tin!"

But the absence of such a mode of formation in the European languages gives a high interest to such words as are to be found in them, which seem to have been formed in this way while the language was still in a state which admitted of such a formation, which is found clearly defined in Sanskrit. Professor Pott has made an elaborate examination of such words in the new edition of his *Etymologische Forschungen*. To the Sanskrit name of the crow, *kāra*, is compared Latin *corvus*, whence, by transmission, English *crow*; while Anglo-Saxon *hreafn*, *raefen*, English *raven*, are allied by real relationship with some form similar to *kāra*, but with an *n* at the end of it. With reference to the raven, M. Pictet states the curious but speculative question, whether the extraordinary similarity between the Semitic names for the raven, Hebrew 'oreb, Arabic *ghurab*, which have no known etymology, and those of the Aryan language, make it

probable that the Hebrew name of the raven, which is mentioned early in the book of Genesis, is of Aryan origin.

With reference to the inquiry whether the ancient Aryans were acquainted with the ocean, or with some inland sea only, M. Pictet's remarks on the names of various shells should be noticed. The connection between Sanskrit *çankha*, Greek *κόγχη*, Latin *concha*, has often been remarked, and would seem, at first sight, to prove that the fact of the ancient Aryans having a name for the great sea-conchs, used for trumpets and vases, must show that they were familiar with marine products, and, therefore, with the sea, before their separation. M. Pictet gives a very plausible etymology of *çankha*, by comparing it with *çâkhâ*, a horn, which being used for a drinking-vessel and a trumpet, would be extremely likely to pass to the great shells which were used for precisely the same two purposes. But his reasoning, that the common name proves anything whatever about the proximity to the sea of the people who used it, breaks down utterly on other grounds. The argument "for it is not to be believed that shells should have been the object of distant commerce at so remote a period" is quite worthless, seeing that it is a known fact that hardly any objects of nature or art do travel so far even among barbarous tribes as the large and beautiful ocean-shells. The fact of the great shells of the Gulf of Mexico having been carried at remote periods from tribe to tribe of North America, far up into Canada, is a sufficient answer to the argument that the possession of sea-shells by the Aryans proves anything as to their geographical position. Our author's remarks on the name of the *oyster*, which, though not in Sanskrit, is found through the European branches of the race, tend to prove that the western section of the race became acquainted with it at a very early period, and in this instance it is reasonable to suppose that they must have lived somewhere near the sea-coast where it is found, as at so early a period the edible oyster would not be carried far.

In concluding his remarks on the animal kingdom, M. Pictet calls attention to the very suggestive consideration, that the Aryan race seem to have gone, so to speak, to first principles, in naming the animals with which they were acquainted, by some epithet characteristic of the qualities distinguishing them, not applying to them old words inherited from some other stage of development of language, with their forms mutilated, and their sense lost. The idea of the fathers of our race having begun at the beginning, not only in developing their civilization, but even in naming the plants and animals around them, from general terms expressing their quality, gives us a sense

of the independence and originality of the Aryan mind, that may well excite our astonishment, and give us a higher appreciation of the part which our race have played in the history of the world.

We propose to give in a future number, a sketch, necessarily very slight and incomplete, of M. Pictet's second volume, which is devoted to the examination of the Civilization of the Aryan race in their early home, the circumstances of their pastoral and agricultural life, their arts of war and peace, their social condition, laws, science, and religion.

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## ETHNOLOGICAL INQUIRIES AND OBSERVATIONS.

By R. KNOX, M.D.

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### *Inquiry into the Influence of Climate and of Hybridity over Man.*

THE natural antagonism of race to race; the antagonism of man to nature's works; the laws negating hybridism in man; the tracing certain races of men to continents or centres of creation now submerged; and the influence of climate in destroying aggressive races—these were amongst the earliest of my ethnological inquiries, undertaken at a time when the superficial work of Prichard had entire possession of the field of ethnology.

The theories which all but universally prevailed before the publication of my lectures on the Races of Man, were, that all men being of one species, the varieties they present are more apparent than real; that it is education, government, climate, and civilization which give rise to these varieties, men being everywhere the same *au fond*: in a word, the hypothesis of Hippocrates continued to prevail until the date I refer to; and, moreover, in respect of the acclimatization of man in various regions of the world, it was boldly asserted that with time and care all varieties of men might be dislocated from the land of their origin and transferred to other regions and other climates, to which they would become habituated, viable, progressive, and as it were aboriginal. Now, although such theories found no support in history, they maintain their ground to this day; and for this simple reason, independent of others, they tallied well with certain theological hypotheses, in the support of which interests unexampled in the history of man for magnitude and importance had been long em-

barked. To the theories just mentioned there was added another, namely, that the various species of animals which adorn the earth were in reality hybrids, produced by the admixture of a few primitive species with each other. This doctrine, supported by the illustrious Broca, the first of living ethnologists, I shall afterwards consider. Let us, in the meantime, attend to the question of acclimatization, and its influence over man. The theories offered by me some twenty years ago, as substitutes for the then received ideas on this subject, were that, when races of men abandon the lands on which they had grown up—their so-called aboriginal land—emigrating to another continent or zone of the earth, they either wandered into desert regions, uninhabited by beast or man, or into others occupied by a section of the human race. In either case it seemed to me certain that the emigrating and obtrusive race became extinct in time. For, either they were speedily absorbed by the stronger or more numerous race in possession (as the Goths, Germans, or Gauls in Italy\*), or, unless continually fed by fresh waves from their original soil, they gradually altered, deteriorated, and withered away, and so becoming non-viable and non-productive, perished. It is needless to say what opposition a theory of this kind met with in North America.

All physiological and zoological theories must, to be trustworthy, be based on observations made on the species in question, and not on analogical arguments drawn from other species. This is my answer to most of the strictures made on my work on the *Races of Men* by a distinguished zoologist, M. Quatrefages. Whether the great and glorious French nation, the most illustrious for literature, science, and art since the Roman period, the most energetic, the most highly civilized, be a hybrid race, as my esteemed friend M. Broca maintains, or not, I shall hereafter consider. But, in the meantime, one experiment at least, on the largest scale imaginable, has been made in comparatively modern times, having a direct reference to these all-important questions, which the theologian, the statesman, and the dynasties of the earth would fain have men believe to be theoretical and of no importance. In vain! Let any unbiassed mind turn over the page of history for the last twenty years, and calmly look at the

\* The history of the Goths is remarkable. When they first encountered the Roman arms, they occupied both banks of the Lower Danube, stretching towards the Euxine and the Dniester. They emigrated into the Roman empire in vast numbers, bringing with them their wives and children. For a time they were masters of Italy; under the name of Austrians, they still hold Venice. Now, how is it they could not maintain their ground in any of the fine colonies they occupied for so long a time?

attitudes of the nations, and he will, I think, be forced to admit that, under the mass of political verbiage, of *persiflage*, of so-called national interests and dynastic pretensions, there lies the question of race, which, sooner or later, will upturn the world. What is the grand question which now agitates America? Is it not a question of race? What has brought Austria to the verge of destruction? Is it not this question of race? What agitates Russia and Germany, England and India but this question of race,—the antagonism of race to race,—the mysterious unextinguishable dislike of race to race? Humboldt, the most illustrious of modern philosophers, as he has been called, although he was no philosopher in the strict sense of the word, but a man devoted to facts, experiments, and direct intuitive observation, published,\* in 1808, his political essay of the kingdom of New Spain, which in fact means Mexico. He had examined into the condition of that dependency of the crown of Spain with infinite care and labour, neglecting no source of information. Here are the results nearly in his own words:—"Mexico cannot be arranged under the head of tropical countries: the mean temperature of the great plains, of those situated at least within the tropics, elevated about 984 feet above the level of the sea, does not exceed 77° of Fahr., that is to say, 14° or 15° greater than the mean heat of Naples. From the configuration of the country you may, with a thermometer in your hand, select, within the distance of a few leagues, any temperature you choose, from that of frozen Lapland to the arid heat of Algiers. On the declivity of the Cordilleras there reigns perpetually a soft spring temperature, which never varies more than 4° or 5° cent. (seven or nine of Fahr.) In the capital of Mexico the centigrade thermometer has been known to fall below the freezing point. If Europeans cannot live and thrive in such countries, where can they live? The whole table-land of Mexico has a medium temperature about that of Rome. Moreover, the country abounds with every production that man can possibly want or desire."

In 1793, according to M. Humboldt, the population amounted to 4,483,529: he estimated the population in 1803 to be 5,808,000; and he inclines to the opinion that the population may double itself in about forty years. The *vomito prieto* is a scourge confined to the coasts, and does not carry off annually more than 2,000 or 3,000 individuals. As to emigrants, Europe does not send more than 800 to Mexico;† and he concludes that the progress of population in Mexico

\* Paris, 8th March, 1808. I quote the translation by Black, the original not being near me at the time.

† So soon as the emigration from Spain began to decrease, Spain recovered

and North America is solely derived from an increase of internal prosperity. We shall see presently how singularly erroneous were his conclusions. From these, and other data and reflections, the celebrated traveller and natural philosopher foretold a brilliant future for Mexico! Ignoring the history of the past and the natural history of man, forgetful of all the moral and physical circumstances that regulate the future, he could see no obstacle to the transference of race from one continent to another. He had become, in truth, wholly a political economist—a disciple of Adam Smith and a colleague of those geometers, mathematicians, and statisticians who leave nature altogether out of the reckoning. In his time the population of Mexico was composed of—1. Individuals born in Europe. 2. Spanish Creoles, that is, descendants of Europeans, but born in Mexico. 3. Mestizos, half-castes between the whites and Indians. 4. Mulattos, between whites and negroes. 5. Zambos, between negroes and Indians. 6. The copper-coloured Indians. 7. African negroes. Lastly. A few men of Chinese and Malayan descent had found their way into Mexico.

This was the character of the population by whose means Canning, Guizot, and others (profound statesmen!) hoped to redress, and foretold that they would redress, the balance of the Old World by the New. My answer, on reading their statements, was immediate, and amounted to this. A premier of England may perform wonderful things; he can erect kingdoms and make kings, but he cannot form a race.

About three hundred years ago, Cortez set his foot on the American continent, accompanied and followed by the best blood of the Spanish race. So long as Spain could stand the drain, Mexico held its ground, Spain, in the meantime, becoming wholly exhausted; and now, despite of the sad experience of the past, they again attempt the same insane game, to be followed by the same results, proving the adage, if it required any proof, that individuals may occasionally profit by the experience of the past—generations of men, never. But yesterday, as it were, Don Pacheco cautioned the Cortes, and through it the Spanish nation, to be prudent and moderate in their next attempt on Mexico and the continent of America. In Mexico he proved the Spanish race was reduced to 8,000, the rest of the nation was one of mulattos or hybrids (a worthless rabble) and of men of the pure

from the exhaustion caused by the drain of her best blood to America. Macaulay is of opinion that Ireland has never recovered the loss of Fitzgerald and the 7,000 men of the best blood of the race, who quitted Ireland with him in 1790.

American blood. He thus warned the Spanish nation what they were to look to from such elements of population. The elements of the present Mexican population, I said, are doomed to destruction. The European element will perish so soon as the European supplies are withheld. The hybrid of all sorts will also necessarily perish; and, with time, the whole population may revert to the primitive Red Indian, the untameable savage, who is now as he was in the time of Cortez. This picture has been drawn by Humboldt. And now, in about fifty years from the period of Humboldt's dream of the progress of the kingdom of New Spain or Mexico, see in what the experiment, for such it is, has ended! I quote no idle traveller, wandering about to amuse himself, without either information, powers of observation, or authority. I quote the official report of D. Pacheco, sent out by the government of Spain, an adept in the laws and manners of the country, a Spaniard himself, and fully disposed to say all that he could in favour of his quondam countrymen.

It was stated in the Madrid journals some years ago, that the Senate commenced, the day before, the discussion of the paragraph in the address relative to Mexico. The principal speaker was M. Pacheco, at one time ambassador to that country. He detailed, at considerable length, the wrongs which Spanish subjects have suffered at the hands of the Mexican government, and declared, in his opinion, the intervention of Spain was not only justifiable, but imperatively called for. The Madrid *Gazette* furnishes the following digest of this, on many accounts, important speech:—

“For the person sent to Mexico (that person was myself), it was needful that the Spanish Government should decide on pursuing in Mexico an active policy. Here is the *resumé* of that policy. 1. To place ourselves at the head of the Spanish race in America, while making them comprehend that we have *bona fide* accepted their independence; but that, in the natural course of the world, Spain is, and must be, at the head of all the individuals of that race. 2. There is in America a nation that is not of Spanish origin, the population of North America, which circumstances render a rival to ours. That race pretends that the Latin race must be subordinated to it in America—an absurd pretension of the Anglo-Saxon race, and in my opinion utterly without foundation. 3. Protection to Spanish interests. In Mexico there are 8,000 Spaniards, who represent 150 millions of piastres. Such were the fundamental principles of the instructions that were given to me. (M. Pacheco read his instructions.) On leaving for America I believed, in common with almost everybody in

Europe, in the triumph of Miramon. When I arrived, things were changed. Seven Spaniards had been assassinated, and the assassination was committed, not by private individuals, but by the leaders of the constitutional forces of the army of Tauerez. One of these leaders was Carvajal, who, after these sanguinary deeds, was promoted to be a general. I then found there was in Mexico a Spanish party and an anti-Spanish party. I say a Spanish party, not because they would be disposed to sell us their country, but because they have analogy—affinity with us, because they retain the traditions of their origin. I say anti-Spanish, when speaking of the other party, because they began the war of Mexican independence by assassinating our compatriots, and because they cease not to repudiate their origin. The Spanish party is that which has risen against the constitution of 1857. It reckons within its ranks all the illustrious of the country. We find in that party Alamar; Cobo is one of them; there are also Bonilla, Lara, Ramirez, Father Miranda, and Helguero. The other party is the one that hates us, that is selling its country to the Anglo-Americans, and that erases the word Mexican from its constitution. The party that in Europe is termed re-actionary and clerical, is tolerant and liberal; it tolerates even liberty of worship. The Federal party, on the contrary, is a party of barbarism, a disorganising party—a party that aspires not to produce the annexation of the country to the United States, but rather to introduce anarchy into Mexico, by means of divisions, and by establishing twenty republics, in place of one. I add, that the majority of the Spanish party consists of whites, of men like ourselves, whilst almost the whole of the Anti-Spanish party is of mixed blood. The Indian race, who form the majority of the country, are most submissive, and most easy to govern. Compelled to halt sometimes among that population, on my way to Mexico, those people asked me for news of the Queen, our Sovereign. I replied, the Queen is my Sovereign, not yours; for you are Mexicans. But they answered, We have always heard our fathers say “the King, our Sovereign;” and that is why we also say the ‘Queen, our Sovereign.’”

M. Pacheco afterwards stated the remarkable fact, that in the space of forty years, Mexico has had not fewer than fifty-five different governments. In conclusion, in 1798 there were, according to Humboldt, 272,000 whites in the West Indies, and in all New Spain 1,200,000; now there are 8,000! In Jamaica, in 1787, of every hundred inhabitants there were ten whites, four people of colour, and eighty-six slaves; now, in the whole island, there are 13,000 whites,

90,000 browns, and 501,000 negroes. Verily Jamaica, Hayti, and Mexico make wonderful progress—downwards into that dark abyss where all civilization ends. Yet all races have a civilization of their own, such as it is.

The same remarks are strictly applicable to Brazil, and the Lusitanian possessions in Africa; the mother country has been drained of her best blood, and the result is worthless. We have it from the latest travellers, that the ignorance of the so-called Brazilian is something astounding. The same fate, as I long ago foretold, awaits the Anglo-Saxon of the Northern States, so soon as the tide of European blood ceases to flow into their territory: and so it will be with the Tasmanian and Australian of European descent. The time was when the Mongol held Central Europe: where is he now? Northern Italy was Celtic, and Milan a Gaulish city: what has become of the Gauls of the Gallic Cisalpine? Is there any Frankish, that is German, blood in old France; or any Vandalic blood in Northern Africa; or any Gothic blood in Italy? Yet I am free to add that there may be many exceptions to these laws, and that there may exist a race of men equal to any climate. These laws, for example, do not seem to apply to many other animals, nor to some plants. Wheat, first introduced into the American continent by Europeans, grows freely and without any cultivation in the fields of Mexico; and oxen and horses thrive all over the American continent. There may be some race or races of man to whom these laws do not apply.

Lastly, persistence of race has ever been held as a proof of distinct species. Now, as I long ago pointed out, the monumental and pictorial remains of Egypt shew us distinct races of men at the remote times when these monuments, etc., were erected. When I first wrote, or rather lectured, on the races of man, Lepsius and Horner had not written. The date of these monuments was unknown to me. Perhaps many may say that the date is still a mystery; in the meantime, it is generally admitted that they have an antiquity of many thousand years, and, if this were well ascertained, it carries back the origin of race to a point in history far beyond all historical evidence. So far as I have been able to discover in history, the races of Man have been always distinct; the antagonism—I had almost said the hatred—of race to race has never ceased. To those who talk loudly about colonization and emigration; the peopling the earth with Anglo-Saxons; the transformation of the Red Indian into a Spaniard or a Saxon, a good Christian and a civilized man; to the all-powerful influence of education, etc.; I take leave to point out the result

of the Spanish Commission, sent expressly a few months ago to Mexico, to judge of the existing state of things. Don Pacheco might have summed up the failure of the gigantic experiment in a few words: 1, reduction of the Spanish race to 8,000; half a million of half-castes—atrociuous, blood-thirsty ruffians, without principle, living by rapine on the peaceable inhabitants, and ready and willing to sell their country (have such men any country?) to the highest bidder; the remaining millions are composed of pure Indians, as nearly as may be in the original state in which Cortez found them.

Thus ends the last grand experiment for human hybridism on the acclimatization of the European race on the continent of America, a land to which they do not naturally belong. A full-blood Indian is President of Mexico. All this I foretold many years ago. Another experiment is now in progress in the North: this time it is the burly Anglo-Saxon race, in their own estimation the biggest, strongest, best race in the world; the only Christian race; the unsurpassable race; the race destined to repeople the world after the extinction of all the others. They will also in time become extinct on the American continent; and so will the Celt of Canada.\* From the character of the Celtic race in Canada I drew the principal features of their colonies all over the world. Thus it will ever be. Nor climate, nor government, nor external circumstances, ever alter race.† They may, and they do affect them, and in time destroy them; but they never give rise to a new race. In half a century, the dreams of Humboldt, of Canning, of Guizot, and other profound statesmen, have come to a close; and nature once more, as I long ago predicted, asserts her rights. The Red Indian is not yet extinct, neither is he civilized. Three hundred years of attempted civilization, education, christianizing, baptizing, have scarcely altered him in the least. So it will happen in New Zealand: the dream of Macaulay, like that of Humboldt and Canning, will never be realized.‡ Humboldt throws out a conjecture—a very

\* See their character drawn by me in the *Races of Man*.

† I entreat M. Quatrefages' attention to the results of the Spanish experiment on the American soil; they completely subvert his theory of the unity of races. Nor has he substantially refuted what I said of the Celtic race in Canada. He says they have increased to about a million, which argues that they do not decay. Be it so. Has the character of the race altered? I find it asserted by a late political author that the population of Lower Canada is half American (States people), and that there is a continual immigration of such persons into the province. Under these circumstances, statistics are of no value. Without any fear of contradiction, I still maintain that the Celt of Canada is still a man of the Louis Quatorze age. That is all I assert.

‡ This dream was a mere transcript of a passage in Gibbon.

probable one—that the present race or races of American Indians may be the descendants of a mixture of Asiatic tribes, and the aborigines of this vast continent; and it is not unlikely also that the figures with enormous aquiline noses observed in the hieroglyphical Mexican paintings preserved at Vienna, Veletri, and Rome, are historical fragments indicating the physiognomy of some races extinct long before Cortez and Pizarro appeared. To this is due, perhaps, the rapid decline of the Carib and Red Indian. (Vol. i, p. 155.)

As with America, so with Australia: the democratic sceptical Anglo-Saxon will here establish his favourite constitution; he will become of course a native Australian, a know-nothing, a true-born Australian, a democrat; he will set up an effete Anglican church, and worship it as children do dolls.\* The imposture suits all his views. And now the race already alters in Australia, and in three hundred years they may be extinct.

*Conclusion.* The various species of Men constitute one great natural family. Each species or race has a certain degree of antagonism to the others, some more, some less. They never mingle; and, should accident cause a commingling, they ultimately separate into their primitive elements. The original history of mankind is as yet unknown. The historian takes no notice, and the scientific man cannot accept of the existing theological systems which attempt to explain his origin. Certain of these systems, unfortunately for them, include in their history of man a cosmogony of the earth and a chronology of man at variance with science and with history. Cuvier refuted the cosmogony, and the paintings and architectural monuments of Egypt refute the chronology.

Throughout this inquiry, frequent allusion has been made to the causes of the extinction and gradual decay of various races of men. The decline or fall of nations it is not so difficult to comprehend; nations are political institutions, which make progress or sink into decrepitude according to the nature of their respective governments; their decline must ever be in the direct ratio of the rigor of the despotism which afflicts them. There is no mystery here; but it is otherwise with races. Much has been said lately of the dying out of savage races in presence of a more highly civilized man; but, after all, there is no mystery in such a case. Deny to any race a free social condition, civil or religious liberty, and the race is sure to perish. But this is not all. The extinction of various forms of life on the globe, and

\* Emerson. Professor Smith of Oxford has given the same opinion.

the appearance of others new to the earth, are phenomena in the production of which man plays no conspicuous part. It is a phenomenon in the hands of nature, and may perhaps be partly explained by a reference to some events which have occurred during the historic period. The Lusitanians took possession of the Canary Islands about four hundred years ago. There lived upon these islands a distinct race of men; this race is said to be now extinct, but they were not destroyed by the aggressive race. Were the Guanches a fragment or vestige of a race, whose centre of creation, the land of whose birth had ceased to be? Did they form a part of the fauna of the land, a portion of which now lies beneath the Atlantic ocean, whilst its eastern part is represented by the Sahara? For this seems to be the history of the extinction of races of men and animals; they perish with the land of their origin, or, as Buffon happily expressed it, their centre of creation. Thus have perished many races of animals and of man. The flat-headed race mentioned by Hippocrates as inhabiting the borders of the Euxine, were in all probability the mere remains of a race over whose centre of creation or aboriginal land the Caspian and Euxine now roll their stormy waves. The singular crania discovered some years ago in Central Germany, are probably the remains of some individuals of the race, who had escaped the catastrophe by wandering into Europe. The extraordinary shaped crania occasionally found on the shores of the desert rocky isles of the Pacific, belonged in all probability to the race whose centre of creation now lies buried under that vast ocean.

I shall return to this subject.

*On the Unity of the Human Race; viewed as a Physiological and Anatomical Question.*

PART 1. It must be well known to all who have carefully studied the works of the most illustrious of all anatomists, the late George Cuvier, that he admitted the fact, though no doubt with some reluctance, that occasionally in the anatomical structures of different species of animals greater differences could not be pointed out, although the species were notoriously and confessedly distinct. Coming within the category, he pointed out the genus equus, or horse; having failed to discover anatomical differences in the skeletons of the various species composing the genus, he was forced to admit that in this instance, at least, anatomy, the grand instrument of all his discoveries, was an unsafe guide, and could not be trusted; was in fact no guide at all. By carefully noting the external characters the

merest savage can and does arrive at that knowledge which the profoundest anatomist in the world could not acquire by the minutest inquiry into the internal structure. Since the time of Cuvier many other facts have been shown, all tending to the same conclusion. The result was this: the bones of an animal, strongly resembling the existing horse, being found in an ancient fossiliferous stratum of the earth, how was the zoologist to arrive at a true inference in respect of these bones? The exterior, the all-important character in zoö-classic was gone, and lost for ever; the skeleton, partial or complete, remains; is it identical, and of the same species as the now existing horse? I lean to the opinion that under such circumstances it was specifically distinct, and belonged to an extinct epoch of living forms; and if so, the coincidence of human bones being found with these implies an inconceivable antiquity of man. On the other hand, all doubt is removed, when by the side of the remains of these doubtful species other vestiges are found, of animals of unquestionable extinct epochs. The specimen, then, in question, was either of the same species as the existing horse, and if so, the present living world intercalated with the past, or if different and distinct, it implied that no dependence could be placed on the anatomical test in palæontology, in so far at least as regarded closely resembling species. For want of correct ideas or of language, or both, we speak of fossil tigers, bears, lions, panthers, as if there ever were such animals, properly so called. They were carnivorous animals; that is all that we know for certain; but as to their resembling the present races of these animals, there are no grounds for such a belief. Thus the whole theory of the restoration of the extinct animal world has always appeared to me to be a delusion, ending in the production of such monsters as we see imitated at the so-called Crystal Palace—monsters, such as never were, and probably never will be found on the earth. Cuvier was very cautious in his outlines of the restoration of the extinct, conscious that by the loss of the external characters all hopes of a correct restoration were frustrated.

As regards man, the question assumes a more important, I had almost said a more serious, aspect. To the various races of men now met with on the earth, the illustrious Blumenbach gave the name of varieties, probably he thought that they are not distinct species, but merely accidental varieties of one species; and this is the view most generally adopted. As there is nothing accidental strictly in this world, these varieties must have a producing cause, and that cause must be physical. Nothing metaphysical can exist, and it is an out-

rage on common sense to give the nonentity a corporeal existence. The varieties of the race or races of men differ more from each other than the horse from the ass; the ass from the zebra, the zebra from the quagga, both internally and externally; yet it has never been maintained that these distinct species of the genus horse all sprung from a common parent. If the theory is to be applied to man, it ought to be shown, first, why it does not apply to the horse; and, secondly, how it happens that man, who boasts of the means which his intelligence devises to enable him to resist all climates, should yet be the animal who seems most of all under the influence of the external media in which he lives. Thirdly. How is it that in tracing backwards in line the pictorial history of man we find that at no period of his history were the races different from what they are now, physically at least? As "*tout le morale est dans la physique,*" I feel assured that morally, as well as physically, man is much the same now as he has ever been. In what follows I shall not fail to consider carefully this part of the question.

2. Hippocrates, the father of medicine, held the opinion that the races of men are merely varieties of one species, and that these varieties result from the varying circumstances in which man may be placed. He supported his ingenious and plausible theory by all the knowledge he possessed of the inhabitants of the earth known to him; for he observed that this amounted to very little. In his celebrated work, *De Aëre, Aquis, et Locis*, he propounded the whole theory of external influences over man, a theory which is much in vogue to this day. It relieves the hesitating and the impatient of many difficulties; has a quasi-philosophic look; has plausibility on its side, and man's superficial observations to support it. But, like Egyptian history, in solving one enigma it unfortunately raises many new ones; and the pleasure derived from perusing the work of Hippocrates and the modern expositors of his views, is a good deal marred by reflecting that the whole theory is antagonistic to historical truth, to physiological observation, to the experience of the present and the past.

The views expounded by Hippocrates seem to have been the same as those of his predecessors. Thus Herodotus asserts that the Persian skulls in his day were soft, and the Egyptian hard; and he assigns a reason for a phenomenon which had no existence.

Men differ more in their intelligence than in their *physique*; to prove this we have only to look at France, Spain, Poland, Russia, and Turkey. Observe the intense Catholicity of the Celtic, Lusitanian, and Italian races; the stubborn Protestantism of the Scandinavian

and German ; the different basis on which they place their belief—the one on faith, the other on reason. Lastly, look at their literature, that ultimate test of all civilization, and of the view they take of art, and you will speedily perceive that it is in the nature of the race, and not in any surface varnish a nation may have accidentally acquired, that the different views men take of the external world are to be traced and defined. These intellectual qualities are equally fixed, permanent, and unalterable, and are much more important than the physical characters of the race.

**PART II.** That some races that once existed have now perished, or nearly so, is by no means improbable. The prime cause of their extinction may have been the destruction of the land of their origin, the centre or focus of their original formation. This theory, I applied to the Phenician race, and to the Basques, which still exist ; to the Caribs, and to the progenitors of the Aztecs, whose focus of origin is probably now at the bottom of the Pacific. Their escape to another continent would not necessarily save the race from final extinction. If the cradle, for example, of the Scandinavian race were to disappear beneath the ocean, their colonies might be found unequal to the support of the race through many centuries in the land of their adoption, and thus the whole race might in time disappear.

The scientific man endeavours to ascertain the antiquity of man—  
1. By historic documents and monumental or other remains of human industry ; 2nd. The more indirect manner by efforts to identify his remains with those of animals which have all perished and are therefore presumed to belong to a previous geological period.

Since we cannot discover the producing cause of race, let us trace man backwards in time in order to ascertain—1. If men have always been of the races we now see ; 2. If any ancient races have become extinct, or any new ones appeared ; 3. Endeavour to ascertain the antiquity of man on the earth.

1. By the discovery of the fossil remains, the immortal Cuvier gave human kind a new reading of living nature: he explained to the world the signification of these remains.\* The result of these greatest of all discoveries ever made by man were—1. A refutation of the Hebrew cosmogony ; 2. A demonstration of the antiquity of life on the globe, and proofs irrefutable that living animals had changed their forms at certain periods of the world's career. To these periods he gave the name of geological epochs, when new forms of life appeared on the globe, and the older forms became extinct. The present order of

\* Mr. Hunter and the Royal Society.

things he thought was comparatively recent; in this epoch, he of course included man. But by pointing out distinctly that man had not been found in any fossiliferous stratum of the globe, his appearance on earth might be quite recent. He avoided all other questions respecting man, his races, his qualities, physical and moral. The fact of man not being found in a fossiliferous state was dexterously seized on by the able Freycinous and the theological world generally, and Cuvier and orthodoxy were easily reconciled. Although his discoveries refuted the Hebrew cosmogony, it did not affect the chronology. The six days were declared to be vast periods in time; what the theologian made of the seventh day, whether a day or a period, I neither know nor care to know. Thus he drew a distinct line between the living and the extinct, the present and the past; his theory of species was disputed by De Blainville; it was denied on philosophic grounds by Goethe and the German school, followed by Geoffroy (St. Hilaire) and others; the English, as usual, came last.\* But long before Cuvier's death, geologists had shewn that the distinction he had drawn between the present organic world, including man, and the past, in which it was supposed that man was not present, or to use a theological term, had not been created, was untenable.

More than thirty years ago, M. Knot, in his *Suites de Buffon*,† wrote as follows, and as his works are well known, as they comprise the labours of many distinguished geologists, I feel surprised at some English naturalists affecting unacquaintance with them, and relating M. Knot's remarks as if they were new and of English growth.

“Spallanzani, a distinguished observer of the last century, announced the presence of human bones in strata of vast antiquity. The fact was denied by Cuvier, but has since been distinctly proved. Donati, on the coast of Dalmatia, has done the same. The appearances were re-examined by Germar, who, besides human bones, found portions of pottery.” Baron Schönlein, M. Schouter, and Count Sternberg, near Köstritz, made similar observations. Count Razomousky was equally successful near Baden. In the Grand Duchy of Austria, Count Briuna, near Kremz, discovered crania of extraordinary shape, supposed at first to come from the ancient burial places of the Avars, but proved afterwards to have no relation to that people. M. Boué, behind Lahr in the Grand Duchy of Baden, in 1823, made similar discoveries as to the juxtaposition of human bones with the remains

\* The author of the *Vestiges of Creation*; Messrs. Darwin, Huxley, etc.

† It was a mistaken idea that any one could *continue* Buffon; no one could write like Buffon.

of the fossil extinct animals; he showed them to M. Cuvier, who objected to the authenticity of the facts. M. Boué gave way at the time, in presence of the first anatomist and palæontologist in the world, but he revisited the spot in 1829, and verified all the facts. The bones were found in a locality from thirty to fifty feet above the waters of the Schutten.

To these facts have been added other discoveries lately made on the soil of France, and respecting which the Academy of Sciences remained dumb. We allude to the human bones found in the caverns of Beze, of Pondres, of Souvignerques, of Darfort, and Nabigra, to which must be added numerous discoveries of the same kind made by M. Schmerling in various caverns of the province of Liège.

It is to be remarked that the human bones of various localities cited above belong generally to races differing completely from those which live at present in Europe. Thus, the heads found in the sands of Baden near Vienna, resemble in form the African Negro races; those of the borders of the Rhone and of the Danube, offer strong resemblance to the heads of Caraihs, and to those of the ancient inhabitants of Chili and Peru, and were supposed to have belonged to Aztecs imported into Europe by Cortez. To all these facts, which in our opinion merit attention, and encourage the inquiries of geologists, may be added others which no longer permit us to doubt that man was the cotemporary of the last cataclysms, which have ravaged the surface of the globe, and which have accumulated on a number of points animals which still exist, with others which no longer live in the same countries, or which even belong to lost species. (*Geologie*, Knot, p. 430, vol. i, Paris, 1837.)

M. Knot adds: It is, then, only by the aid of doubts more or less *specious*, more or less ingenious, that one can attribute these human bones to deposits posterior to the historic times. Thus was the gauntlet thrown down to the theologians so early as 1837, and the parade of repeating\* it without any new facts in 1862, was unnecessary and uncalled for. The peat bogs of Denmark have been referred to as affording proofs of the unfathomable antiquity of man, but the crania discovered at Engis and Neanderthal were not found in these peat bogs, which underlie the ancient extinct forests.

The oldest forest now overthrown was of pine trees; next came oaks, birch, beech, which now cover Denmark. In the beech forests only we found the traces of the men of iron; amongst the oaks, only the men of bronze; amongst the pines, only the men who worked in stone (flint-headed arrows, hatchets, etc.); beneath the peat we

\* Lecture at the Royal Institution in 1862.

find no remains of man whatever. In a word, leaving romance and the three forests out of view, human bones have been found in caves in Germany, associated with the bones of mammals now extinct; and of others that could only have existed under totally different climatic conditions; associated with the bones of the *elephas primigenius*, the cave bear, the *urus*, the mammoth, the *hyæna*, and the hairy rhinoceros, we find those wonderful flint axes, etc. All these facts were submitted to M. Cuvier in 1829, who denied their authenticity, and who would do so now were he alive.

Of the two skulls thus suddenly raised to importance,\* one was found by M. Schmerling at Leipzig, in the cave of Engis, in 1833. Can this be the same Schmerling quoted by M. Knot? if so, the discovery is exactly thirty years old. The other skull, known as the Neanderthal skull, was found in a cave in the valley of that name, overlooking the Dussel, a tributary of the Rhine. In whose possession is the skull now?

**CONCLUSION.** The conclusion I arrive at is, that mankind forms one great family composed of various species. How these species originated we know not, and may never know. Man does not stand alone; but forms a portion of a serial of which many would have been lost, but which may be recovered by palæontological research. Some years ago (1821) I was conversing with M. Cuvier in his private library attached to the Museum, when an assistant of the Museum brought him a specimen of a fossil but just received. He gazed at it for a few moments with profound attention, and seemed lost in thought. On remarking to him that I was not aware that the fossil remains of animals placed so high in the scale by naturalists, had ever been found, before the specimen in his hand in a fossiliferous stratum of the earth, he observed to me that the specimen before us was the first, but *would not be the last; still higher were sure to come.* And so they have come; the *quadrumana*, as they are incorrectly named, have been since found in abundance in strata of great antiquity, to be followed, no doubt, by man himself.

And now, if we put faith in the researches of Bone, Knot, Donati, and others, fossil man has been found, or at least human remains in localities implying that the men to whom these remains belonged

\* The idea promulgated lately, that in human civilization there were a stone, bronze, and iron epoch or periods (*Lancet*, Feb. 16, 1862), has no real foundation in facts. The three forests (the author seems fond of the number three; numbers strike the imagination of a popular class)—the three forests were found in Denmark buried under the soil, offer no new facts as to the antiquity of man on the globe.

were coeval with those animals we call fossil and which are at all events, now extinct. They belonged then to a prior geological epoch—an epoch past and gone. The centres of creation which gave them birth no longer exist, and other seas, continents, and islands, usurp their place. Most of their animal and vegetable products have perished with them; the cataclysm might be sudden or slow, but progressive, and sure to end in one way, namely, the extinction of the forms of life appertaining to that centre of creation. When slow, it might, and no doubt did happen, that some portions of the fauna and flora did escape immediate destruction by finding a refuge on islands and other lands beyond the range of the catastrophe; but as the external circumstances, summed up by Hippocrates under the terms of "earth, air, and waters," were different and hostile to that form of life, so the remains of these forms of life gradually and slowly but surely perish. When the Spaniards first discovered the Canary isles, they found them in possession of a race of men quite distinct from all others. They had a civilization of their own, and certain usages slightly approaching the ancient Egyptians'. Whence came these people, and how was it that they remained isolated, as it were, from the rest of mankind? The theory to explain the phenomena I long ago proposed and now repeat, was this:—The centre of creation to which the Guanches belonged, and of which they formed a part, no longer exists; it formed a zone or belt across the African continent, extending westward into the Atlantic and eastward across Egypt and the Red Sea into the Indian Ocean; the seas now cover a large portion of that zone, and the desert of Zahara represents another part which, after having been submerged, has again risen from beneath the waves. The Guanches, then, were a race affiliated to that whose architectural remains still astonish the world—the Copt. The same theory seems to me applicable to the Aztecs and the supposed aborigines of the American continent. They were not the aborigines, but races belonging to other centres of creation, and would have perished in time had no European ever set foot on the continent. It applies also to the Maori of New Zealand, to the Tasmanian and Australian, to the natives of the Andaman isles, to the Basques, the Phœnicians, and no doubt to many others.

Neither climate, nor accidental deviation from the normal structure, nor hybridity, seems equal to the production of various races, unless we assume an antiquity to man including one or more geological epochs. Now this, by far the most probable, view remains yet to be proved. My firm belief is and always has been, that the proofs will some day be found. What we call the history of man is a mere delusion—a mere

speck when compared with the pre-historic period. That man has lived through many great changes on the surface of the earth is not a theory of the present day; the opinion seems to have been held by philosophic observers of an early age. Thus, Mohamed—born Mohamed Kaswini, of a race, as his name implies, by no means remarkable for a tendency to scientific pursuits, thus expresses himself. Mohamed seems to have lived in the seventh age of the Hegira, *i. e.*, towards the close of the thirteenth of our era. He wrote a book on the wonders of nature, and in it he thus expresses himself.

“In passing one day by a very ancient and extremely populous city, I asked of one of the inhabitants ‘who founded their city?’ He replied to me, ‘I know not, and our ancestors knew no more than we do on this point.’ *Five hundred years afterwards*, passing by the same place, I could not perceive a trace of the city. Inquiring of one of the peasants about the place, ‘when it was that the city was destroyed;’ he answered me, ‘what an odd question you put to me, this country has never been otherwise than as you see it now.’ I returned there after another five hundred years, and I found in the place of the country I had seen—a sea. I now asked of the fishermen, ‘how long it was since their country became a sea,’ and he replied, ‘that a person like me ought to know that it had always been a sea.’ I returned again after five hundred years; the sea had disappeared and it was now dry land; no one knew what had become of the sea, or if such a thing had ever existed. Finally, I returned once more after another five hundred years, and I again found a flourishing city. The people told me that the origin of their city was lost in the night of time.”

These are some of the revolutions to which the living world has been in all times exposed; it is almost needless to say, that they depend on physical and material causes, and are the natural effects of influences set in motion by the inherent qualities of matter.

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## ON THE APPLICATION OF THE ANATOMICAL METHOD TO THE DISCRIMINATION OF SPECIES.

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THE discovery of true descriptive anatomy, and its application to all classes of the zoological kingdom, led the illustrious Cuvier to the discovery of the fossil world. Many distinguished observers had

previously, no doubt, made some happy conjectures respecting the antiquity of the fossil world, and the advantages to be derived from the application of the anatomical method in the discrimination of species. Daubenton, Vicq d'Azyr, and Pinel, in France; Pallas, Blumenbach, and others, in Germany; Hunter, in England, had long prior to the era of Cuvier discovered and appreciated the utility of anatomical inquiry in zoology; but the credit of having placed this method on a new basis, and of having demonstrated by its means the true nature of the fossil world, belongs, unquestionably, to Cuvier. As many observations and hypotheses have been ascribed erroneously to this illustrious man, and more especially in England, it seems best to ascertain in the first place his own opinions of the value of the method he had discovered.

In the fossil world, those external characters by which an animal species is at once discriminated from all others, had been, with but few exception, wholly destroyed. I allude more especially to the animals we call mammals; and thus, if the species of these fossil animals were to be discovered at all, it could only be done through their osteological remains, including the teeth. The plan succeeded admirably, and led to the most astounding discoveries by Cuvier. As was to be expected, it threw the Linnean method into the shade, and all but extinguished the reputation of the greatest naturalist of any age, the Count de Buffon. It led Cuvier imperceptibly, and seemingly, without his being aware of it, to the adoption of some theories or hypotheses still maintained in England, but abandoned everywhere else. One of these was the attempt to prove distinct epochs of zoological formations, called in this country "creations," a word never used by Cuvier. As a strictly scientific man, he strenuously opposed the philosophical ideas of Goethe and his school, declaring them to be pantheistic, and not scientific; he denied an animal series, and refused to intercalate the extinct with the living world. Species he held to be unchangeable, under every circumstance, and, drawing his proofs from monumental and written records, he showed that the living animal kingdom had remained unaltered since the earliest historic period. To man and to the now living world he ascribed a late origin, as compared with the fossil and extinct. Shortly before his death his theory of the fixity of species was called in question by Goethe and Geoffroy St. Hilaire; the animal serial was demonstrated by De Blainville, and the fossil intercalated with the living world; the metamorphosis of forms was proved, beyond all dispute, by embryogeny, and the philosophic and transcendental

theories of Goethe came to be accepted for scientific truths, and embryonic forms were supposed to pourtray the extinct or fossil world. But even Cuvier himself was aware that anatomical characters could not in every instance characterize species; and he instanced the genus *Equus*, or natural family of the horse, whose species cannot be distinguished from each other by the anatomical method; he might have mentioned many others. How is it with the natural family of man—with mankind?

As most natural zoological families show affiliations with other families, and do not stand alone, it seems proper to inquire, in the first instance, into the relation of mankind with other kinds, that is, other families of animals. Notwithstanding a tolerably strong resemblance between man and the animals usually, but erroneously, as I think, called *quadrumana*, or four-handed, there is a sharply-defined and deep gulf between these two great natural families. They differ remarkably in their external characters, and equally so in their osteological; and, although it be true that the brain in these two classes is almost identical in its forms, and that the retina in the apes of the old continent, has the foramen of Soemmering, a structure, perhaps, peculiar to man, there is yet enough to show that it requires many natural families to bridge over the gulf which exists between them, or, in other words, to fill up the serial. Now, the researches of De Blainville lead us to conjecture, with every show of probability, that the wanting links will be supplied hereafter—1. By palæontological discoveries of animals lower than man, yet above the apes;\* or, 2. By the formation of other species in the course of time, when the existing order of things shall have passed away, following the fate of all its predecessors.

The determination of distinct species in mankind can be made only on the same principles we employ in determining species in other natural families. The characters are either external or anatomical. We have seen that the anatomical method failed in Cuvier's hands when applied to the natural family *Equus*, and De Blainville showed that it also failed in many other instances. Should it fail when applied to man, I shall not be in the least surprised; for, although it be certain, as I think, that the internal structures differ essentially in every species from all others, yet it is obvious that such differences are

\* The most modern examples of fossil anthropoid ape with which we are acquainted are the *Dryopithecus* and *Pliopithecus* of the Miocene, probably allied to the existing *Hylobates*. The forms which are discovered in the newer or Pliocene beds are allied to the *Semnopithecus* and *Macaci* of India. Borneo and the Gaboon have not yet been geologically surveyed. (Ed. Anthropol. Review.)

not sufficiently strong to be readily recognized, and therefore, are of little value to the zoologist, and of no importance to mankind generally, who ever have, and ever must look to the exterior alone. Thus, Blumenbach was wrong, as I think, when he attached so much importance to the configuration of the human cranium, thus inducing many persons to suppose that a distinctness of species was only to be determined by constant specific differences in the form of that section of the skeleton. That such differences exist I believe; but even if they did not, this were no argument against the specific differences in the races of man, for it is to the external characters mainly that we must look for specific distinctions. Supposing the Jewish race to have become extinct, and no monumental or other artistic productions have recorded their physiognomy; who, from their osteological remains, could have described the race, or guessed at those physical and moral characteristics which distinguish them in so marked a manner from all other races?

The skeleton of the head, usually spoken of as the skull or cranium, encloses and protects the encephalon. It has relations externally with powerful muscles, and its inner table is in harmony with the external surface of the encephalon. The capacity of the cranium, properly so-called, may generally be assumed to be the measure of the encephalon, to which, however, even in mammals, there is one exception—certain cetacea. Besides providing cavities for the protection of certain organs of sense, it articulates with the vertebral column, of which it seems but the continuation. Goethe first used the expression "cranial vertebræ,"\* and its correctness is now all but universally admitted. Between its tables we find osseous cavities, with prolongations into them of the mucous membranes of the nose and pharynx; the uses of these sinuses are absolutely unknown.† They are also wanting in the cetacea.

Now, when we look at the form of the skeleton of the head in the various races of men, it is easy to observe that they differ remarkably from each other, not so much in the capacity of the cranium, as in the shape or configuration of the skull and face, and in the relations of the face to the cranium, differences still more remarkable during

\* This expression was rather used first by Lorenz Oken, in 1806, who, speaking of a deer's skull which he had found in the forest, exclaimed "Es ist eine wirbelsäule!" (it is a vertebral column.) Goethe's memoir, claiming the right to the discovery, after it had been successfully established in Europe, was not published till 1820, a fact which the recent publication of posthumously issued letters, of doubtful authenticity, does not overthrow. (Ed. *Anthropo. Review.*)

† Dr. Knox always denied the generalization that the absence of the frontal sinus was a constant character of the Papuan race. (Ed. *Anthropo. Review.*)

life. This difference in form was first observed by Hippocrates, and ascribed by him to artificial pressure of the head of the child, which practice being continued for some generations, the malformations, at last, became hereditary. But the artificially deformed feet of Chinese women have never become hereditary. So that the theory of Hippocrates seems, at least, extremely doubtful. Blumenbach himself doubted if these differences in the configuration of the human skull were constant; the candid Prichard denied that they were, and he has been followed lately by others—Williamson, Owen, etc. In respect of the capacity of the cranium, Dr. Tiedemann fancied that he had found in my own museum several crania of African Negroes quite as large and as finely proportioned as the highest of the white races. Out of the exceptions he established a law, and in this he has been followed by others. But if such variations in form were frequent and permanent, the race would in a century or two become entirely altered: now this, we know, never has happened. Such varieties extend only to a generation or two, and then cease, the primordial forms returning—those forms, namely, which are in unison with nature's great scheme and with the existing order of things. Not that there is or can be any selection, as Mr. Darwin expresses it, Nature is not an intelligent being, and, therefore, there can be no selection, properly speaking. Again, if varieties in any one race were numerous and frequently occurring, this circumstance surely ought to have told upon races favourably situated in other respects; yet, in so far as I can perceive, in examining the monumental records of Egypt, the Copt and Negro have remained unaltered for at least six thousand years. The same law seems to hold good with other races so long as they do not abandon their aboriginal land. When this happens, they perish.

The exceptions so much dwelt on by Prichard, Williamson, Owen, and others, have been greatly exaggerated. They have no influence over the exterior, and probably none over the intellectual qualities of the race; whilst against the hereditary extension of these varieties stands the physiological law of non-vitality and extinction. Many years ago I remarked that varieties in the distribution of the arteries, implying other varieties in structure, were much more common in the very young than in the adult, implying, as I thought, a want of vitality or of viability in these individuals. Thus, nature checks the extension of all important varieties in structure, the individuals being either non-viable or non-productive. This accidental approximation of the individuals of any race to another seems wholly to be without any real results, otherwise hybrids, amongst such, might be fertile.

Now, as I asserted long ago, they never are; and, lately, M. Boudin placed before the scientific bodies of France incontestable proofs of the correctness of my views on this point.

A conformation of the osteological head distinct from all other races characterizes the Australian and Tasmanian, the Esquimaux, the Bosjesman, the Kaffir, the Negro, the pure Mongol, the Carib, the Peruvian: all these races have race characters more or less marked, and not to be observed in other races. That these races may be converted by education into white men is, I fear, an entire delusion.

The situation of the foramen magnum of the occipital bone\* is still a matter of dispute. Dr. Prichard thought it to be "the same in the Negro as in the European;" and so it may be, if no allowance be made for the face. The situation of the foramen magnum of the occipital bone is not the same in the Negro as in the European. Dr. Prichard says it is exactly behind the transverse lines, bisecting the antero-posterior diameter of the base of the cranium. Supposing this measurement to be correct, which it is not, it has nothing to do with the *pose* or position of the head upon the vertebral column, which, all must know, depends on the position of the condyles of the occipital bone. A line bisecting the antero-posterior diameter of the skull, and dividing into two equal parts, passes in the European head through the centre of the condyles of the occipital bone; and the same measurement applies nearly to the antero-posterior diameter of the entire head. Not so in the coloured races. In speaking of the base of the cranium, I am not quite sure to which Prichard and his followers allude; for very generally in anatomical works the base of the skull, including the upper jaw, is confounded with the true base of the skull.

Now, as regards other measurements. The diameter of the cranium, measured with callipers, between the fronto-parietal sutures and midway between the vertex and the base of the skull, will be found, on an average, to be less by nearly an inch in the dark races than it is in the European. This seems to me an extraordinary difference in the capacity of that portion of the brain which all fancy to be the region of the higher intellectual qualities—of calculation, of comparison, and of reflection.

It is admitted by Mr. Williamson, that in the German the frontal diameter was five inches; in the French, Spanish, and English, 4·5;

\* See for accurate information on this subject, Crull's excellent work, "Dissertatio anthropologico-medica, de Cranio, ejusque ad faciem ratione", 8vo, Gröningen, 1810. The *angle* of the occipital foramen to that of the line formed by the basioccipital bone, is the one which we are in the habit of using. (Ed. Anthro. Review.)

in the dark races as low as 3·6 and 3·7. This is all I contend for. The measurements of the occipito-frontal arch, inter-mastoid, etc., are of no value. The length of the head and face (skeleton of the head) is a true natural motory character, and strongly characterizes the fair from the dark races; but the mingling up the two segments of the head leads to confusion and to erroneous inferences. The cranium being divided into two parts by a line (which I presume was perpendicular) drawn from the anterior edge of the foramen magnum occipitale to the centre of ossification of the parietal bones, so as to divide the interior into two chambers, an anterior and a posterior, the respective capacities of these chambers were next ascertained. The results gave—

*Anterior Chamber.*

German	.	.	.	.	51
English	.	.	.	.	43
Esquimaux	.	.	.	.	40
American Indian	.	.	.	.	32
Tasmanian	.	.	.	.	32

The numbers speak for themselves.

The remark, that in some crania the ring of the sphenoid does not reach the parietal on one side, was first made by me. I do not attach much importance to it, excepting as tending to illustrate the history of retrogressive development.

Mr. Williamson remarks "that the position of the foramen magnum occipitale was found to be exactly behind the transverse lines bisecting the antero-posterior diameter of the base of the cranium, which is the position in European skulls. The situation of the foramen magnum is, therefore, the same in Negro as in European skulls."—Page 24.

But these measurements, admitting them to be correct, which they are not, do not touch the real question at issue, which is the position of the Negro head on the vertebral column, as compared with that of the European. Had the measurements been made through the centres of the condyles of the occipital bone, the results would have been very different.

In a report on a collection of skulls of various tribes of men inhabiting Nepál, collected and presented to the British Museum by Mr. Hodgson, late resident in Nepál, Mr. Owen expresses an opinion "that it is only with regard to the Australian and Tasmanian aborigines that he could feel any confidence in detecting the distinctive characters of a race; that, in fact, Negro-shaped skulls occur amongst

all races ; that the white races have no advantage in this respect over the dark-coloured races."

Now, German and Russian travellers have made similar remarks in respect of the inhabitants of the Caucasus ; and I was informed by my esteemed friend, Dr. John Sutherland (of the War Office), that whilst travelling in the Tyrol he found numerous specimens of those models of beauty whose portraits have been placed on canvass by the early Italian painters—women with beautiful oval Greek face and head, combined with fair hair and blue eyes—figures, in short, not to be seen in any Italian race. In troublesome times, nations and races, out of which nations are formed, flee to the mountains, where their descendants long find protection. The country of Nepāl describes in some respects the regions to which I have alluded.

Nepāl is in a long and narrow tract of land, bounded to the north by the great mountain-wall of the Himalayas, separating it from Thibet ; to the south, extending into the plains, bounded there by Delhi, Oude, Bengal, etc., and extending to the Chinese frontier. Situated between 27° and 31° north latitude, it is extremely varied in climate, and presents numerous narrow valleys of great altitude. It has been long known that the numerous valleys are inhabited by a variety of mixed races, which cannot be traced to their origin. The aborigines were probably Tartars or Chinese ; they were invaded by the Hindoos about, probably, the fourteenth century ; then came the Mohammedan sovereigns of Delhi ; the inhabitants fled to the mountains.

All this has been carefully described by Dr. Latham in his admirable work on *Descriptive Ethnology*. A small population thus tossed between two, or rather three, overpowering foreign empires, cannot be expected to show the characteristic forms of a purely primitive aboriginal race. In addition to these circumstances connected with Hindoo, Mongol, Chinese, and Arab conquests, must also be taken into account the peculiar social habits of the Nairs—habits the reverse of those of the western world, and of all other races known to me.

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ON THE DEFORMATIONS OF THE HUMAN CRANIUM,  
SUPPOSED TO BE PRODUCED BY  
MECHANICAL MEANS.

BY THE LATE R. KNOX, M.D., F.R.S.E.

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HISTORY informs us that in very ancient times a belief prevailed that by mechanical means applied to the head of the infant, another form might be given to it than that intended by nature. Hippocrates was the first, I believe, who mentions the circumstance, ascribing the practice to certain people who resided near the shores of the Euxine. Like a true professor of the conjectural art, he added theory to the fact (if it really was one), that at first the deformity produced by art required to be practised on each individual child; but that afterwards, the deformity having become hereditary, the mechanical means were no longer required. It is needless for me to remark that artificial deformations never become hereditary, and, therefore, the theory of Hippocrates falls to the ground. But the facts still remain, that is, admitting them to be facts, for there are two, not one. The first is, did there live by the shores of the Euxine a race of men with deformed heads (the Macrocephali)? Secondly, were these deformations produced by mechanical means, or were they mere exaggerations of a peculiarly-shaped skull, to which mechanical pressure might give a more distinctly marked character? I lean to the opinion that such a race existed, more especially since crania have been found near Kertch, in the Crimea, presenting well-marked deformations. So far as I can learn from the reports, they were a flat-headed race, with depressed foreheads and skulls, which bulged out tolerably, and in this resembled the Chenooks and Caribs of modern times. What gives a peculiar interest to the remarks of Hippocrates, and to the discovery of deformed crania at Kertch, is the finding similar crania in Germany associated with palæontological remains of great antiquity. Thus, a flat-headed race seems to have extended in ancient times from the shores of the Euxine, probably not a sea at that time, to the centre of Europe, coeval with races of animals which are now extinct, like the flat-headed race of men themselves. With the area or centre of their creation, the Fauna and Flora of the region have disappeared, and new forms of life, including new races of men, have taken their place; not new creations, but new forms of men and

animals, adapted to, viable and reproductive in, the media surrounding them. Perhaps the most remarkable of these deformed, flat-headed crania was found in a cave at Engis, near Luthik, in Germany,\* and geologists do not hesitate to ascribe it to an antiquity equal, at least, to the extinct fossils of the formation. Another cranium was found at Neanderthal, between Dusseldorf and Elberfeld, perhaps quite as old as that from the cave of Engis. I do not think them much more deformed than some crania I have seen picked up on the shores of desert islands in the Pacific Ocean, one of which was in my own museum. They have a certain resemblance to the chimpanzee, but not to the gorilla. It is stated also that the limb bones are thicker and broader than those of the present races of men, implying that they retained to their adult condition certain foetal peculiarities. These facts rest on the authority of Professor Schaaffhausen, of Bonn, and may, no doubt, be entirely depended on. A race of men coeval with that period, having round crania, resembling those of the present Lapps, but with a prominent ridge over the eyes, has been described by Lartet; and Danish naturalists speak of a race of Molluscophagi; but I have not seen their observations, nor Mr. Lubbock's memoir. They do not, however, belong to the class of deformed skulls, whether by mechanical means or otherwise.

In other regions we find deformed crania, showing that such were by no means confined to the regions I speak of. The Chenook skull has been often described; also the Carib. These are skulls which seem as if they were flattened from before backwards; such also was the case with the Aztec. In his remarks upon the deformed crania of Central America, Mexico, and Peru, M. d'Orbigny has the following observations:—"No head is to be found amongst the present Aymaras. They have the same form of head as the Quichuas, comparable to the flattened skulls of their ancestors, seen in tombs in the lake of Titicaca, in those of the province of Muñecos, in the wildest part of Carangas, and in the valleys of Tacna. What proves, if any proof were wanting, that this deformity is owing to a mechanical process, and is not a part of the natural structure of the race, is the fact that in the same tombs, together with the depressed skulls, others are found of a very different shape."—P. 470, "Prichard." In this conclusion I do not agree; the fact merely shows that two distinct races occupied the same country. On the other hand, the

\* No evidence of artificial compression appears to us to be present in the Engis skull; and so far from its being flat-headed, the skull exhibits a remarkably even contour. (Ed. Anthropol. Review.)

Peruvian skulls I have examined in this country seem to me to present a quite different deformity than that now spoken of. It consists in a highly irregular-shaped cranium, combined with a remarkable want of symmetry, and this extends to and includes the bones of the face. I have observed this to be all but constantly present in Peruvian skulls, whether ancient or modern.\* Could we accept *en totalité* the views of the excellent Prescott, on the civilization of the ancient Peruvians and Mexicans, we should feel inclined to arrive at the conclusion, that the shape of the cranium, and, by inference, of the brain, has no influence over human civilization; but against this view there exists a mass of evidence which cannot be readily set aside, even admitting the view I adopt to be the correct one, namely, that all or most races are quite equal to the invention of all the social arts, which, originating in necessity, clearly follow the exigencies of each race. But such inventions are no proofs of the capability of the race for that high civilization which embraces not only the social, but the emulative or fine arts, including an ennobled literature, profound science, an abstract philosophy, as was first distinctly placed before mankind by the antique Greeks.

The questions discussed in this memoir naturally lead to others, such as the origin of species, the antiquity of man on the earth, and the development of all living forms from a primitive, original, living molecule—in a word, to the philosophy of zoology, or the system of nature. Prior to Cuvier's great discovery no true philosophy of zoology could ever be imagined; the system most in vogue at present was invented by Goethe; it belongs wholly to him, and probably could not have originated with any other race than that to which he belonged—the race which produced Leibnitz and Kant, Gall and Wolff, Niebuhr and Schelling. Translated into English it has assumed a very plain and practical character, and has even been mistaken for science. But philosophical speculation is not science, nor did Goethe ever mistake the one for the other.

\* D'Orbigny's observations on the whole subject are very confused. The skulls which we term "Quichua" are the so-called "Inca" skulls from Pachacamac, and are essentially short-headed (brachycephalic), exhibiting a cranial type wholly distinct from the extinct long-headed races of Lake Titicaca. Whether those latter races were the ancestors of the existing Aymarás is entirely a different question, and one to which the state of our knowledge precludes as yet any definite answer. (Ed. Anthro. Review.)

REVIEW OF THE PROCEEDINGS OF THE ANTHROPOLOGICAL SOCIETY OF PARIS.\*

BY M. PAUL BROCA, SECRETARY GENERAL;  
HONORARY FELLOW OF THE ANTHROPOLOGICAL SOCIETY OF LONDON.

*Delivered June 4th, 1863.*

GENTLEMEN,—Called upon to address you on this solemn occasion, when the Anthropological Society, after an existence of four years, celebrates, for the first time, the anniversary of its foundation, I purpose to retrace the history of your labours, to show what you have done for the progress of our science, and the great and legitimate part you have taken in the promotion of ideas and studies, which have been too long neglected.

Anthropology, as you conceive and cultivate it, is the youngest of all sciences; and we may well feel surprised at its late birth. Is there among subjects accessible to scientific investigations, one which can compare in interest or importance with the science which attracts you to this hall?

Would it not appear that man, before inquiring into the objects which surround him, should rather follow the precept of the wisest of Greeks, and endeavour to know himself? But humanity in its evolution resembles the child, which at first careless of his own being, is only curious in regard to surrounding phenomena; and who, at a later period, proud though ingenuous, more attentive to external objects than to the process of his thoughts, admires himself, without taking the trouble of self-observation, and remaining in ignorance of his own self, perceives, when he arrives at adult age, that he has seen, scrutinized, and analyzed every thing except his own nature. Such, and slower still, is the progress of knowledge in humanity, which has studied everything excepting itself.

As humanity had, even before the commencement of civilization, lost the remembrance of her humble origin, and found herself already at the first dawn of the sciences, the queen and mistress of this planet, she was apt to believe that she was born in all her force and splendour; that the earth was her patrimony and not her conquest;

\* Having been favoured with a copy of M. Broca's admirable address, we have much pleasure in inserting a translation of it *in extenso*, though we are from its length compelled to omit several interesting articles intended for this number.  
EDITOR.

that the three kingdoms of nature had only been created for her service and pleasure: the stars to furnish her with light; the days and nights to divide her time; and the seasons to secure her harvests;—in one word, she was apt to believe that the universe had only been created for her; and so long as she conserved that illusion, she feared to disgrace and to lower herself to the level of brutes, by submitting to description, classification, and to the methods of investigation of natural history.

It was only in the last century that, guided by a sounder philosophy, men of science ventured to take up anthropological studies. Whilst Linnæus assigned to man a place in his zoological classification, Buffon wrote his *Natural History of Man*, and the first monument of our science became one of the masterpieces of our literature. But we should in vain, in these immortal pages, look for the precise and rigorous facts which we now exact. Though Buffon describes, as well as it was then possible, the physical characters of peoples, and the varieties of form, stature, and colour which distinguish them, still he was, from the want of sufficient authorities, unable to group and classify these varieties, and to arrive at a proper notion of *race*. This was the work of Blumenbach, who, with more ample means of information and taking the new science of craniology as a basis, established in the *genus homo* methodical divisions, and gave, for the first time, that, without which no science can be established, *viz.*, a nomenclature. Buffon had laid the foundations of a *Natural History of Man*, and of *Ethnography*, or description of peoples; Blumenbach laid down the basis of *Ethnology*, or the science of races.

The distinction of races being admitted, an immense field for investigation opened at once. It was not merely requisite to complete or to rectify the classification and the descriptions of Blumenbach, but to inquire into the origin of permanent varieties, hereditary types,—characters so diversified, and yet so graduated, which distinguish the races. For this purpose, it was first necessary to study the influence of external conditions, such as climate, alimentation, mode of life, etc., on the human organism; to inquire how far these different agents were capable of modifying the individual or the race; and within what limits the laws of heredity and atavism maintained these varieties. It was then requisite to determine the filiation of the peoples, to trace the course of their migrations and intermixture, to interrogate their monuments, history, and traditions; to follow them up beyond the historical period, so as to arrive at

their cradle. All these were entirely new questions and new problems, which until then had not been put to science; and these multiplied and unlimited investigations, which require the simultaneous concurrence of zoology, anatomy, physiology, philology, and palæontology, must converge to constitute the science of man, or anthropology.

Such is the mission bequeathed by the eighteenth century to our own. But who, sixty years ago, would have tried to carry out this programme would have spent his life in useless efforts. The hour had not yet arrived; before grouping the sciences they must have been acquired; and some of those tributary to anthropology were not sufficiently advanced to furnish it with a fulcrum. Comparative philology just made its *début*; archæology had as yet not extended its domain beyond the limits of Western Europe; and palæontology and geology, these twin sisters, were as yet scarcely able to walk. All the ages which preceded the historical period were thus inaccessible to the student, and classical history itself, which criticism had not yet purged, nor a free examination emancipated from the theological yoke,—this history itself confined the past of humanity within a factitious frame, in a restrictive chronology; a modern bed of Procrustes, in which the most important facts regarding the life of primitive peoples could only be admitted, shortened and mutilated.

To found anthropology upon its veritable basis was then impossible, and we cannot but admire the prodigious intellectual movement which within half a century has prepared the soil upon which we now build. Never had human knowledge grown so much within so short a period. At no time had the spirit of inquiry displayed itself with such might, in every direction. The impassible Egyptian sphynx has revealed his mysteries; the antiquities of America, these patents of nobility of a world which we cannot any more call new, have displayed before our eyes unexpected marvels; and Nineveh and Babylon, exhumed from their coffins, now speak again. The superficial strata of our planet, perseveringly interrogated, have opened like the pages of a book, where the three kingdoms of nature have their archives, where every species before disappearing left its mark; where man himself, so late in coming, has yet left the proofs of his antique existence; and the pages of this immense book tell the history of innumerable beings, which from epoch to epoch, like the runners in the circus, successively transmitted to each other the torch—

“Et, quasi cursores, vitæ lampada tradunt.” (Lucretius, ii, 79.)

Whilst archæologists and palæontologists reanimated the material

remains of the past, other scholars ascended the chain of centuries by a different road; they resuscitated the dead languages, and recovered in these immaterial organisms, in these fossils of human thought, the pre-historic annals of the peoples; the proofs of their forgotten migrations, of their unknown filiations, the *débris* of their first creeds, and the impress of the various phases of their intellectual, industrial, and social evolution.

In this incomparable half century, which has seen so many discoveries, which has explained so many enigmas, which has transmitted to us precious documents, as to the past of humanity; the study of human races has become enriched with an enormous mass of facts. Africa, always inhospitable, has ceased to be impenetrable; the Australian continent has been explored; European ships carry our seamen or missionaries, and our philosophers to every coast.

Nearly all the peoples on the globe have been observed, described, represented in pictures, studied in their manners, industry, language, religion, and traditions; our museums have received their remains; and casts, skulls, and skeletons, brought from all parts of the globe, have rendered the study of the most distant races accessible to the sedentary philosopher.

Each has in his own way profited by this rich harvest. Some, the pure naturalists, exclusively occupied with the zoological question, have tried to correct and complete the classification of human races; others, still more special, have concentrated their attention on craniology, and have made this science, founded by Blumenbach and Camper, the basis of anthropological studies. Others, finally, ignoring the proceedings of natural history and anatomy, have subordinated the physical characters of races, and have given the preference to the characters drawn from comparative philology. These isolated researches in the various branches of the science of man, have, no doubt, been fruitful. Many particular questions have been better fathomed by being treated exclusively, and the number of demonstrated facts was considerably increased thereby; but this was not sufficient for the formation of a fascicle of methodically connected branches, which alone in the present day can constitute a science. The various branches of anthropology were already in existence, but anthropology itself, towards which they were to converge, did not yet exist, and to give it organization and life, more was required than individual efforts. Where was the mind universal enough to embrace so many branches of knowledge, and capable of co-ordinating them? The combined genius of Aristotle, Haller, and Humboldt, would not have

sufficed. That vivifying principle of our epoch, even more fertile in the field of intelligence than in that of material progress, association alone, can attain this object, and it is for this purpose, gentlemen, that the Anthropological Society has been formed.

We cannot, certainly, flatter ourselves to have been the first who perceived the necessity of flinging into a single bundle all the branches of anthropology, nor of having first attempted it. Many others before us have traced out such a programme with varied success. M. Boudin, our last year's president, in his inaugural address, acquainted you with the manifesto of the "Society of the observers of Man," which was founded in Paris at the beginning of this century, upon principles differing but little from ours, but which, as it was before its time, could not definitively be constituted.

In England, the learned Prichard, that indefatigable inquirer whose glory nearly equals that of Blumenbach, devoted his long life and his eminent faculties to the composition and publication of a great, and still unrivalled work, in which natural history, ethnography, and philology mutually support each other. In France, the illustrious William Edwards, who opened a new path by studying for the first time *the physiological characters of human races considered in their relation to history*, founded in 1839—a memorable date—a society whose name and remembrance will not perish—"the Ethnological Society." To study at the same time "the organization of human races, their intellectual and moral character, their languages and historical traditions, so as to constitute upon these veritable bases the science of ethnology," was the object of this society which prospered for several years, and whose remarkable labours have exercised so striking an influence on the evolution of anthropology. Foreign philosophers soon became anxious to follow our example. *The Ethnological Society of London*, and the *Ethnological Society of New York*, were organized on the same plan, in the same spirit, and on the same programme as that of Paris.

But this programme, gentlemen, was not yet complete; it was that of ethnology or the science of human races, and not that of anthropology or the science of man. To describe and classify the actual races, to point out their analogies and differences, to study their aptitudes and manners, to determine their filiation by blood and language, is no doubt to run over much ground in the field of anthropology; but there remain higher and more general questions. All the human races, in spite of their diversity, form a great whole, a great harmonic group, and it is important to examine the group in its *em-*

*semble*, to determine its position in the series of beings, its relations with other groups of nature, its common characters, whether in the anatomical and physiological, or in the intellectual order. It is not less necessary to study the laws which preside in maintaining or changing these characters, to appreciate the action of external conditions, the changes of climate, the phenomena of hereditary transmission, and the extreme influences of consanguinity and ethnic intermixtures; these are great and manifold questions within the sphere of natural history and general biology. Finally, in a more elevated sphere, and without venturing to attain the regions which conceal the problem of origin (a fascinating and, perhaps, insoluble problem), our science eagerly searches for the first traces of man's appearance on the earth, it studies the most ancient remains of his industry, and gradually descending from incalculably remote epochs towards the historical period, it follows humanity in its slow evolution, in the successive stages of its progress, in its inventions, in its struggles with the organic world, and its conquests over nature.

Ethnology, is then, only a part of the science of man; the other part is "general anthropology," which has occupied so large a place in your labours. It is by this, gentlemen, that our society is distinguished from those which preceded it, and it is for this reason that it has adopted the name of the *Anthropological Society*. Here again, the example set by France was not long in being followed by foreign philosophers. It is scarcely four years that we have entered this path, and already have we seen arise in Germany, the *Anthropological Congress*, founded by Professors Wagner and de Baer; in England there was, a few months since, founded the *Anthropological Society of London*, under the presidency of our eminent colleague Dr. James Hunt. And I entertain the conviction that the successors of Morton will find it necessary to organize in the United States an Anthropological Society, as soon as the civil war which desolates their country shall cease. Henceforth general anthropology and ethnology form but one science,—the most noble of all sciences, since it has for its object humanity, considered not only in itself but in its relations to the rest of nature.

I thought it my duty, gentlemen, to cast a rapid glance on the principal phases through which the science of man has passed up to our time and to point out the mode in which you have conceived it, in order better to show the impulse you have given to it. I wished first to expose the object and the plan of your labours; for the success of an undertaking depends above all on the solidity of its foundations.

But it no less depends on the perseverance and activity of those who devote themselves to the task; I shall, therefore, endeavour to show how you have acquitted yourselves of the mission imposed upon you.

You will not, gentlemen, expect from me even a summary analysis of all the memoirs, communications, and discussions which have occupied your meetings. You have discussed so many facts, that I should tax your patience to present to you a *resumé* of the collective labours which already fill a volume of *Mémoires* and more than three volumes of *Bulletins*. I was, therefore, obliged to confine myself to select among the subjects of your researches some few which by their novelty or importance appeared to me to have particularly excited your attention. You must have given me too many proofs of your indulgence to induce me to make such a selection, upon which I should never have ventured, if I had not found it materially impossible to submit to you a complete review of all that you have done during the past four years. Some other time, when the periodical return of our solemn meetings may restrict the report to one year, I might be able to strike the balance of your labours in a more equitable manner.

In order to put something like order in my exposition, I purpose first to examine the facts relative to ethnology properly so called, and to reserve for the end those which concern general anthropology. But it would be vain if I were to endeavour establishing an absolute separation between these two great branches of our science; for many complex questions pertain to both. It will, therefore, frequently happen, that I shall have to transgress the line of demarcation which I have just traced.

1. ΕΤΗΝΟΛΟΓΥ.—Ethnology, or the science of human races, comprises the study of their distinctive characters and of their classification, their languages, their manners, creeds, industry and arts, and the part they play in history. There are none of these subjects upon which you have not thrown some light by your discussions and researches. You have brought to bear upon them the contingent of your special knowledge, some as naturalists or anatomists, others as philosophers, archæologists, or linguists.

The illustrious *savant* who two years since occupied this chair as president, and whose death has left such a gap in our ranks, Isidore Geoffroy Saint-Hilaire, has presented us with a memoir "*on anthropological classification, and the principal types of mankind*"—a masterly work, in which he sums up the results of thirty years' researches. Having passed in review the classifications of his predecessors, and the principles upon which they were founded, and having shown that

the most apparent distinctive characters are not always those possessing the greatest value, and according the pre-eminence to the characters of the conformation of the head, M. Geoffroy Saint-Hilaire points out that it is not sufficient to divide mankind into a certain number of races, and that the distinction rests sometimes upon first class, and sometimes upon much less significative characters, and that consequently a scheme in which all the races are disposed in the same rank, is not conformable to the principles of natural history. To obviate this inconvenience, principal and secondary races have been admitted; but there results from this a continual confusion in language, and hazardous conclusions in science, as it leads to consider all the secondary races to have descended from the same anthropological stock, which by their re union formed a principal race; and this would suppose as demonstrated what yet remained to be proved. Thus, the great Mongolian race of authors comprises the Tartars, Chinese, Malays, Polynesians, Hyperboreans, Paraboreans, all the aborigines of America, whilst the filiation of these different races, and their immediate parentage, are yet problematical.

M. Geoffroy Saint-Hilaire, therefore, thinks that the primary division of mankind, established upon distinctive characters of the first class, constitutes *types*, and not *races*, and that the determination of these types should be founded upon the conformation of the head.

The types which he admits are four in number: the *Caucasian* type is characterized by the predominance of the superior parts of the head, that is to say the region of the brain; the *Mongolian* type, by the predominance of the middle part of the head, namely, the superior region of the face; the *Ethiopian* type, by the predominance of the inferior parts of the face, the region of the jaws; and the fourth, the *Hottentot* type, by the predominance of the whole region of the face. The two elements serving to determine the relative development of the facial regions are: the breadth of that region measured by the prominence of the cheek bone, and its antero-posterior extension measured by its obliquity, or by its forward projection beyond the region of the brain. The terms *orthognathic* and *prognathic*, now become classical, clearly express the latter character. In order to express the first, namely, the transversal development of the superior part of the face, M. Geoffroy Saint-Hilaire has coined the term *eurygnathic*; and thus has been enabled to characterize in a few words the four types of mankind. The Caucasian type is orthognathous; the Mongolian type Eurygnathous; the Ethiopian type prognathous; and finally, the Hottentot type is both eurygnathous and prognathous.

All the races known may easily and naturally be divided into these four types, and those of each group are distinguished between themselves by characters sufficiently marked to enable him to dichotomize them. His synoptic scheme comprises only twelve races; but he has only admitted those best known, without pretending to give this number as definitive.

Among the races comprised in the classification of our illustrious colleague, there figure separately the *hyperborean* and the *paraborean* races, which are confounded in all previous classifications. All the peoples near the polar ocean, from Lapland to Kamtschatka, from Kamtschatka to Greenland, have been considered as forming one single race. It was supposed that living as they do beyond the arctic circle, in the same conditions of light and heat, in the midst of a flora and fauna, the relative uniformity of which is well known to naturalists,—it was supposed, I repeat, that all these peoples ought to have acquired a similar organization and the same physical type; hence they were considered as one race—a secondary race, emanated from the stock common to the Mongolian races. But this view, apparently confirmed by the observation of some superficial characters, was not founded upon the study of first-class characters; and it must be acknowledged that the admission of the anthropological identity of the polar races of Europe, Asia, and America, was somewhat lightly made. The expedition of Prince Napoleon to the northern seas has enriched the gallery of the museum with a series of crania, which has disposed of that illusion. Our colleague M. Henry Guérrault, one of the surgeons of that expedition, was struck with the considerable differences obtaining between the cranium of a Laplander and that of an Esquimaux. From the very exact and complete description which he has published in our *Mémoires*, it results that the two peoples approach the Mongolian type, the first by the globular form of the cranium, the second by the disposition termed *pyramidal*; but that these two characters, which are combined in the Mongolians properly so called, are not so in the hyperboreans (sitting of March 15, 1860). There are thus at least two hyperborean races; and this discovery, made by M. Guérrault during his voyage, has been confirmed by Geoffroy Saint-Hilaire, who, reserving for the hyperboreans of Europe the name hyperborean race, has designated the Esquimaux the *paraborean* race. Do all the peoples disseminated beyond the polar circle, on the borders of the glacial ocean, pertain to either of these two races? This is a question the solution of which requires ulterior researches.

You have received communications on the ethnology of nearly every part of the globe, either from your correspondents, or from your own members. In order to facilitate and popularize the researches, to give them as much as possible an uniform direction, and to render the observations collected by individuals unknown to each other comparable, you have paid particular attention to the drawing up of instructions destined for the guidance of travellers. The instructions for Peru, Mexico, Brazil, Senegal, and France, have already been published. Those concerning Northern Africa, Chili, Indo-China, are being prepared. These instructions are not simple interrogatories; your commissioners wished that the traveller, though a complete stranger to our studies, should find therein a summary of ethnological facts relative to the country he was about to explore; and in this didactic exposition attention is drawn to doubtful, contested, or unknown points, and especially to such of greater importance.

Our venerable colleague M. Gosse, senior, so well known by his excellent researches on artificial deformation of the cranium, and so enthusiastic for the study of the civilized nations of the New World, has kindly undertaken to draw up the instructions for Peru; to him, also, we owe the instructions for Mexico, completed by the valuable indications of Abbé Brasseur de Bourbourg, the renovator and almost the creator of the primitive history of Mexico. I would particularly draw your attention to the *Notice-questionnaire* on the ethnology of France, in which your learned reporter M. Gustave Lagneau, faithful to his motto, *Facta, non verba*, has condensed within eighty pages the history and the description of all the peoples of various races which, from the pre-Celtic period to the present epoch, have occupied, colonized, or conquered the whole or part of the French soil. A rich bibliography—original, according to the habit of our colleague—gives to his treatise a character of precision and exactness which doubles its utility. The author has justly insisted upon the origin of those circumscribed and special populations which perpetuate themselves upon several spots of our territory, without becoming fused with the surrounding populations, and who preserve their habits, manners, and particular physical characters. This part of his work will render eminent service to provincial observers.

But you will have understood that ethnological instructions are not sufficient. It is not enough to impart to travellers the notions requisite for distinguishing the races of any country before describing them; they must further be enabled to collect their observations according to the requirements of science, and for this purpose they

must be furnished with the means for study, for a certain and easy mode of investigation, and with a general and uniform method applicable to all particular cases. Such is the object of the *General Instructions* which your commissioners have been charged to prepare. Those concerning the physical, anatomical, and physiological characters of the races of man are now ready. The commissioners purpose rendering the anthropological observations accessible to every man possessing the will, and to simplify as much as possible the instruments necessary for making observations.

I am not even able to enumerate the many communications we have received on the ethnology of foreign countries, and the reports and discussions to which they have given rise. The ethnology of Africa is represented in our publications, by the memoir of M. Pruner-bey on the Negroes; by two original communications from M. Berchon on Senegal; by a note of M. A. Duval, on the Gaboon; by the reports of M. Bertillon, on Southern Africa; by M. Dally, on Abyssinia; by M. Perier, on the Kabyles, and specially on the origin of the light-haired Kabyles, who inhabit a portion of the chain of the Atlas; and finally, by two long memoirs by Pruner-bey and Perier on the ancient races of Egypt.

If our two eminent colleagues do not agree in their conclusions, you must consider the difficulty of the subject and the insufficiency of the documents we possess on the primitive period of Egypt. The Champollions, the Lepsius, the Mariettes, and their glorious rivals, have conducted us from century to century, from dynasty to dynasty, to the period of the great pyramid, but these brilliant conquests of archæology, by thus passing beyond the limits of the historical period, have not yet succeeded to give us the key to Egyptian Ethnology. Which was the primitive race which had the honour of kindling in humanity the first torch of civilization? Did it come from the south, from the east, or from the west? Grave questions these, allied to problems the most contested in our science, which, nevertheless, M. Pruner-bey does not despair of solving. Twenty years study in Egypt, and continued in Paris in the Anthropological Gallery of the Museum, gave him the right to speak with authority, the more so as, combining the knowledge of craniology with philology, he possessed the most reliable guides in primitive ethnology.

Our colleague was first engaged in determining the physical characters of the ancient Egyptians. Blumenbach had already remarked the little uniformity of the type of their crania, and the study of monumental paintings enabled us to recognize, that from a remote antiquity

the population of Egypt must have been subject to numerous intermixtures with various peoples of Africa, Asia, and even Europe. M. Pruner-bey in studying this difficult subject has concentrated his attention to the most ancient paintings, and the mummies of the most remote period; and he has thus arrived to establish, that from the origin of the historical period, the Egyptian population presented already two eminently distinct types which he has designated *type fin* and *type grossier* (the fine and the gross type). These two types, of which pure specimens are found to this day among the Copts, as well as among the Fellahs, are derived from two different races which were already intermixed in the Valley of the Nile, before historical times, and which saw spring up the first of all civilizations. But what was the origin of these two races? and what was their respective share in the intellectual, material, and social progress? Without giving a definitive opinion as regards the race of the gross type, M. Pruner-bey is disposed to consider it as the first occupant of the soil. Civilization, according to him, was the work of the race of the fine type, which came from a foreign country, but this race was neither Aryan nor Semitic, as might be supposed. The crania of the fine type present to those of the Asiatic races insufficient analogies. Finding thus, as regards the Orient, nothing but uncertainty, the author turns to the Occident; he compares the fine type with that of the Lybian or Berber race, and this time the resemblance appears to him complete. Philology interrogated in its turn, replies in a similar sense. M. Pruner-bey compares, first, the ancient Egyptian language with the Indo-European, then with Syro-Arabian languages, and finds between these three groups of languages radical differences, whilst the strict parentage between the ancient Copt and the Berber languages, seems to him evident. From this double series of researches, he draws the conclusion that the fine-typed race, the mother of the civilization of Egypt, was of Berber origin, but he adds this civilization did not proceed from any other, and was born in the Valley of the Nile.

Such is the system which M. Pruner-bey has developed before us with as much science as talent. To throw doubts upon opinions so consequent and supported by proofs so winning, nothing less was required than the vast erudition of M. Perier. The study of Egypt is for our eminent colleague as an heir-loom. His father-in-law, the illustrious Larrey, was one of the Pleiades of *savants* who accompanied the expedition of General Bonaparte, and which for the first time revealed to Europe the old world of the East. Devoted for a

long time to the study of Egyptian antiquities, at the same time ethnologist, historian, and philosopher, M. Perier contests one of the conclusions of M. Pruner-bey. He admits with him, that the civilization of Egypt is autochthonic; but if he is to search for its origin beyond the Valley of the Nile, he would look for it in Asia, in mysterious India, and not in Lybia.

This dissidence between our competent colleagues, which already manifested itself in the short and interesting discussion which followed the reading of M. Pruner-bey's memoir, led us to expect a more exhaustive debate after M. Perier's reply; but this hope was not realized. A sudden attack of a long and cruel malady, prevented M. Perier from attending our meetings for a whole year, and to read himself his important memoir. He has intrusted with it our colleague Edward Michaux, who was obliged to leave us. This young *sarant*, full of courage and hope, asked permission to take part as military physician in the expedition of Mexico. It was more the love of science, than the expectation of advancement which induced him to solicit this favour. Is not Mexico the Egypt of the New-World? Edward Michaux hoped assiduously to explore the sacred soil of America, this cradle of a civilization so long misunderstood, the remains of which, shrouded with briars, still astonish us by their grandeur and majesty. Attacked by that terrible scourge which has decimated our army, he died at Vera Cruz on the 8th of April, 1862, but a few days after his arrival. I cannot refrain from paying him in this place the just tribute of our regrets.

This leads me to speak of the important contributions of Mr. Gosse, senior, to American ethnology. Our venerable colleague has for a long time past fixed his attention on this subject, and his essay "on the artificial deformation of the cranium," published in 1855, whilst raising some general questions of high interest, has at the same time furnished valuable elements for the solution of some special questions. A large number of American peoples had formerly, and have even now, the habit of deforming the crania of their children, by methodical compression; and it seems that such practices, which substitute for the natural shape arbitrary and factitious forms, must deprive craniological determinations of any value and significance. This difficulty is so much greater, since certain infantile diseases may produce natural deformations which may thus be confounded with artificial deformations. An interesting collection of crania, arranged by M. Giraldès, in the Foundling Hospital, which he has enabled us to inspect, gives evidence of this cause of error; and the interesting

memoir of our eminent colleague, Dr. Barnard Davis, one of the authors of *Crania Britannica*, has shown us that pathological deformations of a peculiar type may be produced in adult, and even advanced age.

On the one hand, M. Gratiolet has drawn your attention to the circumstance that artificial deformations are, in their origin, frequently an exaggeration of the distinctive characters of the race which submit to it. Every people, whether savage or civilized, is prone to admire itself, to attach an idea of beauty or superiority to the features which distinguish them from other peoples; and it is for the purpose of giving their children a conventional beauty that mothers use mechanical appliances to compress the heads of their babies. A deformed cranium is thus like a caricature, in which the exaggeration of the most characteristic features does not destroy the resemblance, and in which an artist of experience may frequently detect the real type of the face. Thus, in comparing the non-deformed cranium of a modern Totonaque with the ancient deformed crania of the island Sacrifios, M. Gratiolet pointed out the natural character on the first skull, the artificial exaggeration of which has produced the strange form of the other crania. Hence, it is not impossible for the naturalist to detect the primitive type in a deformed cranium.

On the other hand, Mr. Gosse has, by the study of the numerous processes of deformation, that were and are still in use in America, been enabled to reduce them to five essentially distinct types, which he has described, and indicated the effects and repartition at the present time and in the past, and has shown us, by various examples, how much the study of this manifestation of human fancy may throw some light on the history of migrations. A process of cranial deformation once adopted becomes part and parcel of national manners; it is one of the most persistent habits which may survive the most distant migrations, and even the change of manners, language, religion, and social condition. Thus the various races, which composed the ancient population of Peru had each a peculiar process of deformation, and the knowledge of this fact has enabled M. Gosse, in his *Dissertation on the Races of Peru*, to rectify some of the ethnological opinions of Messrs. Rivero and Tschudi. But the most curious result of the reseaches of our colleague is relative to the history of the peoples which practise "*the relevated cuneiform deformation.*" This strange and so characteristic deformation is effected by two layers of argil—one of which compresses the forehead and the other the occiput. It was practised in Cuba, at the time of Columbus, among the Natchez and various peoples of Florida, as described in Morton's

*Crania Americana*, and finally in Peru, where it is still in practice among the Omaguas and the Connivos. Is it probable that peoples so distant from each other should, without knowing each other, have conceived the same idea, and the same mode of realizing it? Is it not rather more probable that a migrating people should have introduced in the different regions its national custom? But though migration from Florida to Cuba seems easy, it cannot be well understood how primitive navigators could have introduced the habit into Peru, without intermediate stations. We are then authorized to think that the people with the cuneiform crania must have traversed, in successive stages, Mexico, Central America, and the Isthmus of Panama. A bas-relief, found in the ruins of Palenqué, representing the profile of an Indian, with a cuneiform cranium, already gave support to this hypothesis; but M. Gosse gave you a more decisive proof, in an extremely deformed cranium, which came from a cavern in the valley of Ghovel, in the state of Chiapas. This cranium, covered with a thick layer of stalagmite, belongs to a very remote period, and yet it exactly resembles the cuneiform crania of Florida and Peru.

Here we have a fact, established by the study of the artificial deformation of the cranium. A great number of centuries ago a migrating people, travelling alternately by sea, or by land, traversed the immense space which separates Florida from Peru, in passing by way of Cuba and Southern Mexico.

Well, gentlemen, this craniological fact strikingly confirms traditions and the archaeological documents, by the aid of which the Abbé de Bourbourg has constituted the primitive history of the new world. In his great work on Mexico and Central America, before Columbus, and in the important introduction which he has published to the *Popol Vuh*, or sacred book of the nations of Central America, the learned abbé has established, that before the Christian era the people of the Nahoas, who had come by sea, from Florida or the greater Antilles, had debarked in Mexico, not far from the spot where now Tampico stands. Descending thence towards the south, along the gulf, the Nahoas halted on the borders of the Lagune de Terminos, a small distance from the ancient empire of Xibalba, which they took possession of. The town Ghovel, which they founded at that period, is but three leagues distance from the cavern whence came the cuneiform cranium, which M. Gosse has presented to you.

After a period of prosperity, the duration of which is not yet

determined, the conquering Nahoas, driven out (174 of our era), by a national revolution, found themselves compelled to search for other dwelling-places, and one of their bands traversing the Isthmus of Panama, established itself in Peru. Thus the same people, the people of the Nahoas, has, by its successive migrations, occupied all the regions where the cuneiform deformation of the cranium was practised; and here, gentlemen, you have two valuable facts—anthropology enlightened by history, and history confirmed by anthropology.

Whilst you have paid particular attention to the civilized races of America, you have not neglected the rest. The report of M. Simonet, on the Magellanic countries; the communications of M. Martin de Moussy on the peoples of La Plata; the notes of Mr. Rameau, and of our correspondent at Quebec, Mr. Landry, on the population of Canada; and, finally, the important report of M. Dally, on the indigenous races and archæology of the United States, prove the interest you take in American ethnology. The numerous questions raised or solved in this last paper have given rise to an animated discussion, in which Messrs. Pruner-bey and Rameau have taken part, and in which the unity of the American races has been refuted by several speakers.

The peoples of Oceania have occupied a large place in your labours. You have chiefly considered them in an anthropological point of view, to which I shall presently recur; here I shall only speak of ethnological facts. The memoir of M. Berchon, on tattooing in the Marquesa Islands, has initiated you in the secrets of this practice, so prevalent in Polynesia. M. Ruzf has read a very detailed report on the ethnology of Polynesia, and our two colleagues of the navy, Messrs. Bourgarel and de Rochas, have enriched your museum with crania which they brought from New-Caledonia, the New-Hebrides, and from Taiti; and have made communications full of interest, respecting the manners, physical characters, and the origin of the Neo-Caledonians. This people, which some fine day, without knowing it, found themselves French subjects, and whom our rifled guns have not yet convinced of the excellence of our rights, belong to the race of oceanic negroes, but who for a century at least have intermixed with the Polynesians. It is by the Loyalty Islands, near New Caledonia, that this intermixture has been effected. The Polynesians of Wallis Island debarked five generations ago in the Loyalty Islands, where they fixed themselves, and intermixed with the natives; and from this intermixture between a Polynesian and a Melanesian race resulted

a hybrid population, which having from the Polynesians derived a taste for maritime expeditions, sent in their turn swarms to New Caledonia. The eastern coast of this island, where the new comers again intermixed with the natives, is therefore inhabited by very diversified tribes, some nearly of a pure black, others less homogeneous, who exhibit all the intermediate tints between black and yellow. It seems, however, that the Melanesian race has conserved its purity in the western region, which is as yet but little known, and which, protected on the sea-side by coral reefs, is separated from the rest of the island by a chain of mountains.

The migrations of the Polynesians and their crossbreds in New Caledonia are of sufficiently recent a date that their remembrance is not entirely effaced; but as they rested only on vague and contradictory traditions among an uncivilized people, their history required an ethnological confirmation, which M. Bourgarel has fortunately given us. Our zealous correspondent has brought us from Eastern New Caledonia fifty-seven crania, which he has divided into three series; the two extreme series represent the types of the black aboriginal race, and of the foreign yellow race; the middle series is composed of the crania of intermediate shape, belonging to the crossbreds of the two races.

To render this investigation complete M. Bourgarel has, for comparison, added a fourth series, composed of twenty-five crania, collected in Polynesia; and taking for each series the mean of all craniometrical elements, he has shown that the yellow race of New Caledonia presents intermediary characters between those of the Polynesian and Melanesian races. Craniology, therefore, induces us to believe that this yellow race, come from the Loyalty Islands, was a hybrid race, and the correctness of the traditions collected by our missionaries is thus confirmed.

You have received but few documents relative to the ethnology of Asiatic nations; you have, however, heard a report by M. Pihan Dufellay on the inhabitants of the Andaman Islands; a notice by M. Fuzier, on the crania which he brought from China; a lecture by M. Armand, on transgangetic India; and a communication from M. Pruner-bey, on the Druses. Finally, M. Cordier, in presenting us with a Turkish cranium of the seventeenth century, established an anatomical and artistic parallel between the Turkish, Greek, and Arab head. This eminent artist had already presented you with the three remarkable busts which adorn our room; and he has taken this opportunity of expressing his ideas on the reproduction of ethnic

types by statuary. Our colleague, you are aware, has opened to art a new field, by demonstrating that beauty is not peculiar to such or such a type; that each race has its beauty, which differs from that of other races, the ideal type of which must reflect in a harmonious equilibrium the intellectual and moral characters, not less than the distinctive features of that race. The laws of beauty are thus not universal, no more than the canon of the proportions of the human body; they should be studied, and specially determined for each race; and it is by this means that M. Cordier, causing the rays of science to penetrate art, has on his return from his travels been able to create that beautiful ethnological gallery which excites the admiration both of artists and savants.

It is with regret that I must pass over several other communications, viz.—on art considered in its relations to ethnology; the remarks of M. Gratiolet on the cephalic types of Grecian statues; those of M. Boudin on the conformation of the base of the thorax in the ancient Greeks; the report of M. Cordier on the system of proportion; of M. Lihartzik, and the notice of M. Duchenne (of Boulogne) on the Egyptian canon rediscovered by M. Charles Blanc.

I hasten to come to that part of your labours which concerns the ethnology of Europe, and especially that of France.

It is the duty of our society to give a vigorous impulse to such researches as may throw the light of science on our national origin. You have not neglected that duty; you began your labours with it, and you have embraced every opportunity to discuss this question. Convinced that craniology is one of the surest guides in investigations of this kind, you have in your museum arranged a large collection of crania of every epoch. Nearly five hundred ancient and modern crania, of authenticated origin and of approximatively ascertained dates, taken partly from the ancient cemeteries of Paris and partly from the Merovingian or Gallo-Roman sepulchres, enable each of you to study the primitive type, and to follow from age to age the effects of the admixture of races. This already rich collection grows from day to day, and I need not remind you that his Majesty the Emperor, in sending you a cranium found beneath a Roman wall, in the excavation of the camp Saint-Pierre, near Compiègne, has directed M. Viollet-le-duc, the director of the excavations, to send you, in his name, all the crania and skeletons which may yet be found there. M. de Roucy, the learned archæologist of Compiègne, who has been charged by the Emperor to conduct the excavations of Mont Berny, has discovered near the ruins of a Gallo-Roman town,

in the country of the ancient Suessones, a burial ground, from which fifty-four skeletons have been exhumed. Seventeen crania have already been received, the rest will follow. I must here not omit commending the intelligent zeal of our colleague, M. Bourgeois, of Pierrefonds, who living in the vicinity of these excavations, has drawn out a plan of the cemetery, indicated the direction and depth of each tomb, measured one by one all the bones of the skeletons, and has delineated the strange attitudes of these bodies, which seem to have been interred precipitately, after some battle between the Gallo-Romans and the barbarians of the fifth century.

In these diverse series of crania, as well in that which our colleague M. Brullé, of Dijon, has extracted from the sepultures of the time of the Burgundians, and which he has presented to us, you have constantly, among the intermediate forms, found two essentially distinct types, the one brachycephalous (head round or short), and the other dolichocephalous (head long), both represented by specimens the more numerous the more we distance the actual period. This is a certain indication of the intermixture which has taken place on our soil before and during the historical period between the groups of races, the one brachycephalous, the others dolichocephalous. Now, all the foreign peoples of the Indo-European stock who have one after another invaded, conquered, or occupied the whole or a part of our country, the Celts, the Kymris, the Germans, were dolichocephali, and so were the Romans, though in a less degree. It is, therefore, not doubtful that the brachycephalous type, still so prevalent among us, is derived from populations anterior to the arrival of the Celts, and, moreover, a considerable number of facts which have been on various occasions expounded by Messrs. Darest, Pruner-bey, Lagneau, Rameau, and other members, have directly demonstrated that, in the period of the stone-age, Denmark, the British Isles, France, Switzerland, and no doubt other countries of Europe, were inhabited by brachycephalous races.

These primitive peoples, the names of which seem irrecoverably lost, were long before the historical period overrun by successive waves of dolichocephalous races from Asia, and then commenced between these two groups of populations an immense struggle, which spread from the Vistula to the Atlantic, from the Baltic to the Mediterranean, and which, no doubt, continued for many centuries; an unequal struggle, in which the stone hatchet proved useless against the bronze weapon, and in which the superiority of arms conquered the superiority in numbers. In vain did the autochthons take refuge in their lacustral

habitations, where their conquerors, by the law of retaliation took, at a later period, refuge in their turn.

The tranquil waters of these lakes, which protected the habitations from beasts, could not protect them against the attacks of man, and the fire kindled by the torch of the enemy easily destroyed their wooden houses, the carbonized remains of which, found in the basin of the lakes, intermixed with piles, arrows, flint-hatchets, and knives, bring before our minds the terrible drama of these conquests. M. Gosse, junior, has, in a highly interesting memoir, told you that nearly all lacustrine habitations have been destroyed by fire, both those of the stone period and of the bronze period.

Everywhere vanquished, sometimes destroyed, more frequently subjugated, the aboriginals still preserved in the regions of the south and east their numerical preponderance, and, intermixing with their conquerors, they engendered hybrid races, which in proportion of the intermixture received in an unequal degree the respective impress of their parent stocks. But whilst they preserved, at the cost of greater or lesser alterations, some of the physical characters, they lost their nationalities, their manners, their language, and even their names. Nevertheless, in some localities better defended by Nature, in certain valleys difficult of access, which perhaps the conquerors did not covet, the *débris* of primitive populations escaped the common lot. Such, no doubt, were the ancestors of those Roman Rhaetians, which our eminent colleague M. de Baer has studied in the environs of Coire. M. Dareste, in his report on the memoir of the learned Professor of Saint Petersburg, has told you how M. de Baer was led to conclude that the inhabitants of the ancient Rhaetian Alps were of the brachycephalous race. Not sufficiently numerous to constitute a nation, they have only preserved their type, and their language in a Latin idiom. But in the chain of the Pyrenees and their slopes, an intelligent and heroic people preserved both their nationality and customs as well as their language. M. Pruner-bey said:—The Basque is the most ancient of all known languages; alone has it survived the wreck of the primitive idioms of Europe; alone does it stand as a living proof of the existence of aboriginal races before the Asiatic invasion, and if, gentlemen, you compare with this irrefutable linguistic proof the anatomical facts which, directly or indirectly demonstrate, that at least some of these were brachycephalous races, you will understand how the illustrious Retzius and all ethnologists after him have been led to conclude that the Basques must be also brachycephalous. Two crania examined by the great Swedish anatomist confirmed this doctrine, and the observations made by M. A. d'Abbadie on the living

gave a fresh support to this theory. Still, a fact of such importance, the keystone as it were of the primitive ethnology of Europe, required a more complete and direct demonstration. For the last four years, foreign ethnologists have frequently applied to you, vainly expecting to find in your museum some specimens of the crania of the Basque race; but excepting the two crania in Stockholm, this race had no representative either in our or any other collection. This gap no longer exists. Two of our members have, with their own hands, exhumed from a cemetery in the province of Guipuscoa sixty Basque crania which have been for some months deposited in your museum. You were thus enabled to control by anatomical examination the rational opinion of Retzius. But why has the verification not been conform to our expectation? Of the sixty Basque skulls in your collection, two or three only are really brachycephalous; most of them are altogether dolichocephalous; and, what was quite unexpected, the mean type of the series is much more dolichocephalous than that of the French in the north.

Are we, then, obliged to reject the whole doctrine of the primitive ethnology of Europe? Is this doctrine sapped at its base? Not so, gentlemen, it is not even shaken. The facts upon which it reposes are sufficiently numerous and decisive, to be considered as settled. Yes, the pre-Celtic populations of Denmark, the British Isles, France, and Switzerland, were mostly brachycephalous. Nothing can destroy this clearly demonstrated fact. But does it follow that before the arrival of the Celts there were none but brachycephali in Europe? Remote as we are from this mysterious period, we are like benighted travellers who, at a distance, confound all the trees of the forest in a single mass. It is rather much for our mind, which only gropes its way, to assume that an unique aboriginal race has upon our soil preceded the races which have made themselves a name in history. But when at present we find the earth covered with a number of peoples, as diversified by type as by language, when we see the most distinct races living side by side, with or without intermixture, upon what grounds do we pretend to assert that the population of Europe must have been uniform four or five thousand years ago? Was humanity then so very young? And migrations and the struggle between races, had they not had sufficient time to spread in different parts of the globe different types? But why make suppositions after the facts have spoken? The diversity of the primitive peoples of Europe is established by human-palæontology. To the series of observations which prove the pre-historic existence of brachycephali, we must join a

series of observations, less numerous it is true, but not less decisive, which demonstrate the co-existence, perhaps the anteriority of the dolichocephalous type. The cranium which M. Garrigou has extracted from a cavern in the Pyrenees and which you have seen in its bed of stalagmite is dolichocephalous; the cranium of Meilen, which comes from a lacustral habitation of the stone period, and of which M. Vogt, of Geneva, has sent you a sketch, is equally dolichocephalous. The celebrated skull of the cavern of Engis which M. Schmerling has found among the remains of the elephant, rhinoceros, and other extinct animals, presents the same form. And the still more celebrated skull of the Neander-valley, of which Professor Schaaffhausen of Bonn has recently sent you a description, and of which you will soon receive a cast to be presented by M. Pruner-bey—this cranium with a form so strange that many *savants* have considered it the oldest cranium known, is it not remarkable by its narrowness and length? In the presence of these facts, gentlemen, it is impossible to disown, that one or several dolichocephalous races must have existed in Europe at an immensely remote period; and even if all the actual Basques were as dolichocephalous as those in your collection, which is as yet problematical, the ethnological theory advanced by Retzius and defended by Pruner-bey with so much authority, is not overthrown by one more exception.

On approaching our own the historical period, you have by your labours and discussions thrown light upon many questions relative to the ethnological origin of our own nation. The memoir of M. Lagneau *On the Gaels and Celts*, in which sound criticism is joined with profound erudition, has proved to you that these two peoples, confounded into one by William Edwards, were, if not different in race, at least in nationality. Our indefatigable colleague M. Halléguen, of Châteaulin, has, in his two memoirs *On the Ethnology of Brittany*, protested against the too exclusive theories and complaisant legends which attribute to the immigrations of the insular Britons an exaggerated ethnological and political influence.

The determination of the physical character of the Gaelic race has been the object of your special attention. Like William Edwards, the great teacher of French ethnology, you have in the actual populations searched for the distinctive features which still stamp their origin. The influence of the ethnological stock upon the variations of stature has been rendered evident by statistics based upon the conscription for the army. The valuable documents of M. Boudin in his *Medical Geography*, have placed at your disposal this new element of

anthropological study. Maps differently shaded represent the repartition of exemptions, or short stature, in the different departments, and have thus, so to say, placed before your eyes the ethnological Gaul of *Cæsar's Commentaries*. M. Sistach, confining himself to a mere recent period, has prepared a new map so similar to the preceding, that you were struck with the resemblance. More recently still, M. Boudin placing the examination of this question upon a different basis, has contrived a fresh map, showing the repartition of high stature and the differences which he has remarked between these fresh results and those relating to short stature. This has given rise to a learned dissertation by M. Bertillon, on the law of great numbers and on the significance and interpretation of statistical documents.

Recruiting has not merely revealed the ethnological influences upon stature. Several maps prepared by M. Boudin have shewn us that the distribution of myopia, rupture, bad teeth, depend greatly upon race. In this respect, as well as in regard to stature, there exists the most striking contrast between the populations of Brittany and Normandy; and M. Bertillon has shewn us, by valuable statistics, that these two populations, so different in origin, occupy the two extremes in the scale of mortality in France.

We possess as yet no numerical report on the dominant colour of the eyes and hair in the various departments of France. All that we know in this respect rests only upon individual impressions. The precise account of our colleague Dr. John Beddoe of Clifton, on the population of Ireland, partly fills the gap; for the ethnological elements which he has examined much resemble those of several of our departments.

Before leaving the field of ethnology, I cannot omit to cast a rapid glance on your linguistic labours. You have by them thrown light upon some special questions; and I must, above all, render justice to the profound knowledge of our colleague M. Pruner-bey. Is there one point of philology which he is not ready to tackle? Is there a family of languages of which he has not fathomed the structure and studied the development and filiation? You have just heard him on the Egyptian origin, passing in review all the languages of Africa and Western Asia; the languages of America, and even those of Australia, had their turn. He it was who made us acquainted with the repartition of the principal primitive systems of numeration; and you would have felt surprised if he had let pass without comment the eloquent and learned communication of M. Chavée *On the Parallelism of the Indo-European and Semitic Languages*. With that lucidity

and conviction which give so much value to his opinion, M. Chavée directed your attention to the essential, radical, and absolute difference which separates these two families of languages; and, despairing to approach them by any filiation, he boldly infers the original diversity which has given rise to them. In his exposition there were two different things: a fact and a conclusion. The fact has been questioned by M. Halléguen, who has pointed out some points of resemblance between the Semitic grammar and that of the Indo-European languages; but it has been accepted without reticence by M. Pruner-bey and M. Rénan, the eminent historian of the Semitic languages. Both have declared that it was as impossible to derive the Sanskrit from the Hebrew as the Hebrew from the Sanskrit. Still they do not admit that the conclusion of M. Chavée is demonstrated. M. Rénan considers the conclusion as possible, even probable; but he adds that all that has passed before the origin of civilization, before the constitution of society, before the organization of languages, is unknown and inaccessible to linguists; and M. Pruner-bey, in assuming the possibility of another hypothesis, remarked that though the Aryan, Semitic, and Turanian languages exhibit no direct relationship, they might possibly have come from the same stock—from a linguistic family lost to us for ever. You have followed with interest the phases of the great discussion on M. Chavée's new mémoire, *On the Morphology of Chinese Syllables*. Here, also, upon a more difficult field, have the same doctrines been discussed with the same talent.

II. GENERAL ANTHROPOLOGY. Time presses, gentlemen; it passes too slow for you, who favour me with your attention, too rapidly for me, who would wish to follow you in all your researches and discussions: but want of space compels me to make an almost arbitrary selection among the numerous materials with which you have enriched the science.

If your ethnological labours have been fruitful, it is because you have known how to apply particular facts to general questions; because, beyond the consideration of types and races, you always evinced the desire to trace the laws of the human organism, the causes of the complex phenomena which manifest themselves under the influence of heredity, education, external media, the conditions which preside over the development of man's social existence, his industry, and his intellectual progress. These subjects of research, as important for the naturalist as the philosopher, the physician, and the physiologist, belong to general anthropology; and I should wish to resume properly what this science owes to you.

Here, in point of fact, all questions were new; the facts themselves were to be collected; they had never been publicly discussed; they were to be analysed, interpreted, grouped; a building was to be constructed, and what a building!—the Palace of Mankind.

I shall not tell you that you have completed a work which will require the coöperation of generations. But you have at least laid down a solid foundation; upon several spots the walls rise already; and I venture to tell you that in four years you have effected more than you expected yourselves.

The position of man in nature is not yet clearly determined. In a purely zoological point of view, or, if you like, from an anatomical standpoint, he differs less from four superior apes than they differ from other apes. He forms with them a natural group—the anthropomorphous group—of which he is only the first subdivision; and our learned colleague, Professor Charles Martens of Montpellier, has made us acquainted with two osteological characters exclusively belonging to this group. But, though by the structure and disposition of his organs man differs but little from the superior apes, he differs from them eminently by his mind and by his language; and, according to the different standpoints which one takes, it may be asked whether man forms in nature a kingdom, a class, an order, or only a genus of the order of primates? You have not discussed this subject in its *ensemble*, but M. Gratiolet has spoken before you of the more important part of this subject. Man is *man* by his intelligence; he is intelligent by his brain; and it is by his brain that he ought to differ from the apes. Yet it is with difficulty that anatomy finds some slight differences between the encephalon of the chimpanzee and the lord of the earth, as pointed out by M. Auburtin. The pretended characters invoked by Mr. Richard Owen have been found incorrect. The superior apes have, like ourselves, a posterior lobe, a posterior cornu, and a hippocampus minor; and there is nothing, unless it be the great difference in mass and the unequal richness of secondary convolutions, which establishes in adults a radical and absolute distinction between the brain of man and that of the superior apes. But embryology and pathological anatomy have furnished M. Gratiolet with a decisive mark of distinction. The order in which the convolutions develop themselves is absolutely different in the two groups. Those which in man appear first, are in the ape formed last, and *vice versa*. What is the result? When from any cause whatever there is in a child an arrest of development of the brain, that organ, so far from approaching the conformation of the brain of apes, differs from it more and more.

This arrest of development, which constitutes microcephaly, always produces a more or less complete idiocy. The brain of microcephali is poor in convolutions, and these not being closely pressed against each other, leave isolated their impress upon the internal surface of the bones of the cranium. The discovery of this fact has induced M. Gratiolet to search if in the inferior races, whose convolutions are less developed, the cranial parietes did not present analogous impressions; and he has shewn you the existence of this character in a Totonaque skull, which since then you have also found to exist in some negro skulls.

This communication, in which our colleague in his happy style has treated of the highest questions of cerebral physiology, has enabled you to discuss the relations of the volume and the shape of the brain to the intelligence of individuals and races. Does the brain perform its functions as a simple organ, or is it composed of several organs subservient to isolated manifestations of various faculties? Is there any relation between the development of this organ and its functional activity? Is there a limit as to weight, below which there is no intelligence manifested? Finally, is the capacity or inferiority of individuals and races wholly or partly dependent on the conformation and volume of the encephalon? Such is the vast field you have passed through. You have heard successively Messrs. Auburtin, Perier, de Jouvencel, Giraldés, de Castelnau, Baillarger, Delasiauve, and above all Gratiolet; and this debate, continued through several sittings, has given rise to a memoir by M. Dareste, in which he has brought to light a number of new and important facts.

The memoir of M. Boudin, on *the non-cosmopolitism of the races of mankind*, has enabled you to examine the question of acclimatization, so important for the colonizing and commercial nations of Europe. Is man cosmopolite? Can he live and preserve his race in every climate? The author of the *Medical Geography* was well fit to try the solution of this problem. He has shown you by history and statistics that excepting a few races, and particularly the yellow race, acclimatization is circumscribed for each race, and subordinate to certain conditions of climate and other media. If many colonies seem to prosper, in spite of these conditions, it is because they are continually reinforced by the mother country. But the rate of mortality exceeding the births proves that the transplanted race does not maintain itself, and that it would become extinct sooner or later, if it were isolated. Our learned colleague insists specially on the obstacles opposing the acclimatization of Europeans in the tropics, in the diseases they con-

tract, from which the natives are more or less exempt; but he adds that the southern hemisphere is much less inhospitable than the northern, and he particularly points out several stations in Oceania remarkable for their salubrity.

These ideas, which so little conform to those generally received, were not allowed to pass without discussion. MM. Brown-Séguard, Baillarger, Verneuil, Bertillon, Martin de Moussey, Simonot, have successively spoken on the subject. M. Berchon has cited facts to the contrary; but notwithstanding some correction of secondary details, it seemed to result from numerous documents submitted to you, that the European races cannot, without continued reinforcements from the mother country, maintain themselves in tropical Africa and Asia.

The study of the diseases which carry off such a number of individuals transplanted to foreign climates, and which do not attack the natives, has enabled M. Boudin to point out the aptitudes and pathological immunities of a certain number of races. As every race has its organic and physiological type, so it has its pathological type revealed by its dominant diseases—by its resistance to certain morbid causes, whilst on the other hand it is prone to contract diseases which do not affect the other races. Thus the “tonga”, this curious ulcer which spares scarcely any native of New Caledonia, and which, like the small pox, rarely attacks the same individual twice, is seemingly not developed among the whites who inhabit that island. Negroes, so much subject to phthisis, even in their own country, are much less exposed than the whites to hepatitis, dysentery, and intermittent fevers. Diseases of the heart and arteries, so common among the English in India, as well as among the English at home, are exceedingly rare among the Hindoos; and cancer, which commits such ravages amongst us, is nearly unknown in New Zealand, South Africa, and among the Indians in Canada. The communications of M. Berchon on Sénégal; of M. Rochas, on New Caledonia; of M. Martin de Moussy on South America; of Mr. Hayward on New England; of Mr. Sandry on Canada; the numerous facts contained in the report of M. Bertillon on South Africa; of M. Rutz on Tahiti; of M. Dally on Abyssinia; the documents collected by M. Boudin on the aissano, or snake charmers; the notice of M. Rameau on the dominant diseases in the United States; and a number of other notices scattered in our bulletins, constitute already a mass of materials, by means of which we may soon constitute a *comparative pathology of the races of mankind*.

Two questions, apparently opposed, and yet connected, that con-

cerning the intermixture of races, and that relating to consanguinity of marriages, have been mooted before you by Messrs. Boudin and Perier. The union of two relations and that of two individuals belonging to different races are like the two extremes of the same series. Is consanguinity a cause of disease and degeneration? Is intermixture a means of improving the races? M. Perier answers these questions in the negative. Consanguinity is only injurious by hereditary disease; but when the two related parents belong to a family exempt from hereditary vice the fact of their relationship cannot injuriously affect their progeny. M. Bourgeois, M. Dally, M. Sanson sustained the same opinion; and the latter has related to you a number of facts borrowed from zootechnics, challenged by M. Boudin. Referring to statistics, the basis of which had been discussed by M. Dally, M. Boudin produced the figures which at any rate seemed to establish the influence of consanguine marriages in the production of deaf-mutism, and our colleague of Nogent-le-Rotrou, M. Brochard, has transmitted to you reports testifying to the same fact.

The second question in regard to ethnic crossings has been investigated by M. Perier, in a long treatise which has appeared in our *Mémoires*. Without asserting, as some modern authors have done, that all crossings of races are followed by a physical and intellectual degeneracy, and whilst admitting that races of the same type, of the same stock, may intermix without injury, our colleague thinks that crossings between remote races can only have injurious results, and is of opinion, *cæteris paribus*, that pure races are superior to the mixed races. M. Boudin joins M. Perier to proclaim the physical, intellectual, and moral inferiority of certain mongrels. M. de Quatrefages, however, without doubting these facts, maintains that in many cases intermixture tempers the races, improves their instincts, develops their aptitudes, and sometimes engenders capacities not possessed by the primary races.

Thus arose a discussion, which after occupying several of our sittings, gradually approached the most arduous questions of anthropology. The questions of the permanence of types, of the heredity of natural characters, of accidental characters, of atavism, which causes, after several generations, the types altered by crossing to re-appear; all these have in their turn been explored and solved according to the various standpoints of the speakers.

All agree that certain types have maintained themselves unchanged since the Pharaonic epoch; that some of them have even survived

multiplied crossings, and a total subversion of political and social conditions; but the dissidences only manifested themselves when the question arose whether the permanence of types was a general law, and whether certain races might not, under the influence of a change of external conditions, undergo more or less trenchant modifications. The question was asked whether the European race implanted for some centuries on the continent of America have in the new climate preserved their primitive character. The observations of M. Rameau on the Anglo-Americans have revealed some curious particulars; but his remarks in regard to domestic animals and plants, and also to man, are merely relative to vital activity and functional power, but not to typical characters. The particulars furnished by M. Quatrefages would acquire more weight if they are confirmed; for they tend to establish that in some spots of North America the European and African races have something in their physiognomy which approaches them to the red-skins. But M. Martin de Moussy has opposed to these yet doubtful instances that of the Europeans of Paraguay, whom he has carefully observed, and who since the sixteenth century have maintained their type, without any alteration. He refers particularly to the history of a German colony, founded in 1535, by the soldiers of Charles the Fifth, who since that time have received no addition of a German element. These Germans of Paraguay are to this day perfectly like the Germans of Europe.

It is not only to the influence of climate that the power of modifying the human types is attributed. It was asked whether certain artificial forms of the head might not during a series of generations become hereditary and produce permanent characters surviving the practice of deformation. This interpretation, admitted by M. Gosse, senior, as regards certain races of Peru, is doubted by M. Gratiolet, who has quite differently explained the facts invoked, and also by M. Perier, who has read before you his memoir on the *Heredity of Anomalies*.

A report by M. Trélat, on the extinction of the native races of Oceania and Guyana, induced you to trace the causes of such a deplorable result, which manifests itself wherever Europeans come in contact with uncivilized peoples, even when no violence is done to them. The diseases imported by the whites, the vices which they introduced by example, are only partial causes; it is not by increase of mortality, but by the diminution of births, by the diminishing fecundity of the females, that half savage populations perish when suddenly brought into contact with a civilized race. There was but one step

from this grave question to that of the perfectibility of the inferior races. Messrs. Quatrefages, Ruz, Delasiauve, and Pruner-bey, think that every race is perfectible, even that the Australians are not refractory to civilization; whilst Messrs. Perier, O'Rorke, and George Pouchet, despair of the future of these peoples.

I should here leave a serious gap if I were to omit mentioning the application of the facts furnished by zootechnics, namely, the examples of the races of domestic animals to the study of general anthropology. Messrs. de Quatrefages, Geoffroy Saint-Hilaire, Perier, Auburton, Trelat, Lagneau, and especially M. Sanson, have in the discussions relative to the intermixture of races, consanguinity, heredity, perfectibility, the permanence of types, brought to bear the facts borrowed from zootechnics, and M. Davelouis has, in a special *mémoire*, expounded the ideas of his teacher M. Geoffroy Saint-Hilaire, on the relations of the latter science to anthropology.

In all these discussions on general anthropology you have listened to two series of arguments, inherent to two doctrines, which everywhere cause dissension, but are here, thanks to your exclusively scientific spirit, calmly discussed. For you, the monogenistic and polygenistic doctrines are no weapons of war; you do not bring to bear upon them political or religious prejudices; they do not divide you into two hostile sects, and the moderation, urbanity, and good faith which reign in your debates, prove that your opinions on this or any other point are only based on science. Without seeking for the occasion to express your opinions you have never dissimulated them. Last year, a report of M. Simonot induced you to investigate the causes of the colour of the skin of the Negro. This was the prelude of a discussion, which took place after a lecture of M. Pruner-bey, and which embraced all the questions relative to the influence of external conditions on the physical characters of the races of mankind. Messrs. Quatrefages and Pruner-bey on one side, and Messrs. d'Omalius d'Halloy, Trelat, Bertillon, Dally, and Sanson on the other, have treated these questions from opposite stand-points. No conclusion was arrived at, nor was it intended. Whilst each of us expresses his opinion freely, the society will never be called upon to express one; it is neither monogenist nor polygenist; it is a scientific association where everyone who likes to search for the truth may take his place without being asked to render an account of his opinions.

Moreover, gentlemen, this debate on the origin of races which some twenty years ago was called "The Great Controversy," is now produced under conditions, which renders it tributary to a greater ques-

tion which may not admit of a decisive solution for a long time to come. When it was believed that humanity was quite recent and scarcely six thousand years old; when in the valley of the Nile upon monuments forty centuries old, there were found represented ethnic types as distinct then as they are now, Jews, Greeks, Egyptians, Hindoos, and Negroes, entirely like their present representatives, it might have been expected that the day would arrive when the question of the multiplicity of primitive types would be solved. But at this moment, the date of the first appearance of man seems indefinitely remote; the periods are no longer counted by hundreds or thousands, but by myriads of years, and we know that our five thousand years of history are but a short episode in the life of humanity. The types which we are enabled to study, appear to us permanent. Can we say that they are so? The four thousand years which have elapsed since the ethnic types have been depicted on the Egyptian monuments, may have produced in the corresponding races changes too slight to strike our attention, equivalent, for instance, to the tenth part of such which constitute for us race characters. But multiply this lapse of time by ten, and there will appear before us, I do not say demonstrated or demonstrable, but simply as possible, a conciliation of the monogenetic theory with most of the facts upon which the opposite theory rests.

This question of the antiquity of man which heads all the rest, could not escape your attention. It was not here that the question was engendered, but you were the first who examined, fathomed, and completed it; and I venture to say, that your discussions, reproduced in a great number of scientific and even political journals, have powerfully contributed to the triumph of truth. It is not lightly, gentlemen, that you have accepted the discoveries and the demonstration of Boucher de Perthes. When M. Geoffroy Saint-Hilaire, in the sitting which preceded the first communication of M. George Pouchet, placed before you some hatchets and knives from the diluvium of Abbeville, objections were raised as to the validity of these proofs. Some of you doubted the origin of the flints, the abrupt surfaces and contours of which might have been produced by accidental causes. But when M. Boucher de Perthes sent other hatchets, when M. Gosse found exactly similar ones in the diluvium of Paris, together with knives and arrow-heads, the constant repetition of the same forms brought conviction to your minds.

The discussion which followed on primitive industry and its successive periods, on the transition from the roughly-worked to the polished flints, on the transition periods from the stone to the copper or bronze

age, and from this to the iron period; this discussion, in which Messrs. Geoffroy Saint-Hilaire, de Castlenau, Gosse junior, Lagneau, Baillarger, and Verneuil, took part, and which implements M. Trelat compared with the actual industry of savage peoples; this discussion, I venture to say, may be cited as one of the most important and interesting contained in your *Bulletins*.

M. Gosse has exhibited before you, in the same gravel-pit, still moist, a fossil rib of the aurochs, and a flint arrow head; he has further shown you a carbonized bone which he has extracted from the diluvium in the gravel-pits of Grenelle. M. Geoffroy Saint-Hilaire has communicated to you the curious discovery of M. Lartet, who found upon the fossil bones of the *rhinoceros tichorinus* and the *cervus megaceros*, deposited in the gallery of the museum, the impress of the stone-hatchets with which man used to cut up the animals before consuming them. I must condense, gentlemen, for the facts are here already too numerous to bear citing, but I must, nevertheless, remind you of M. Delanoue's interesting communication on the researches made in the valley of the Somme, and of the geological proofs regarding the antiquity of the diluvium, which, in addition to the hatchets, contains the remains of the rhinoceros and the elephant.

An intelligent being, capable of working the flints, of kindling fire, of killing and cutting up large animals, has then existed upon our soil simultaneously with the mammoth, the rhinoceros, the gigantic deer, and the cavern-bear,—animals the species of which have been extinct for an incalculable period of centuries.

The antiquity of man is thus reduced to the commencement of the quaternary period. It might ascend to the tertiary period, if it were true, as M. de Jouvencel supposed, that the sand pipes (*puits naturels*) were the work of man. But M. Bert has opposed this hypothesis by objections on the value of which I can pronounce no opinion. Moreover, the moment has not yet arrived to fix the time of man's advent upon the earth. Positive facts, irrefutable evidence, show that man existed at the time of the diluvium; this is the first date of his history, or rather the first known date, but it is not impossible that we may find traces of his earlier existence.

In order to form some idea of the immense period of time which must have elapsed since the diluvial hatchets were worked, I must recall to your minds the details given by M. Delanoue on the geological constitution of the bed of the Somme. There are, in the environs of Amiens, beneath the recent and the loess formation, the thickness of which amounts frequently to ten meters, two strata

of diluvium, the one red and superficial, characterized by its irregular and but little rolled flints; the second, deep, of grey colour, the round flints of which have been strongly rolled. These two strata, each several meters in thickness, are separated by a layer of lacustral deposits, containing fresh-water shells, and which has sometimes a thickness of five meters. Now it is exactly in the grey or *inferior* diluvium, immediately beneath the tertiary formations, that the remains of human industry have been found associated with the fossil bones of the mammoth and rhinoceros. Thus, after the first diluvial epoch, which gives us the first date of humanity, there was a longer period of repose during which fresh-water lakes were formed above the inferior diluvium; a second geological change then induced the formation of the superior diluvium; at a later period, the conditions changed again, and a thick layer of loess re-covered the flints of the second diluvial period; and finally, a new order of things took place, during which, the recent terrains were formed above the loess. It follows thus, that since the hand of man fashioned the flints of the valley of the Somme, the geological conditions have changed not less than four times, and the duration of these successive periods is truly incalculable. It is remarkable that, whilst the remains of human industry are so over abundant in the inferior diluvium, there is no trace of them in the layers which separate this diluvium from the vegetable soil; man excluded from these parts by the accumulation of lacustral waters, could only reappear there at a relatively very recent period, after the extinction of the large animals, which he formerly combated, after the fusion of the glaciers to which M. Delanoue is inclined to ascribe the loess formation. During this long glacial period, of which Mr. Ch. Martens has given you so clear and learned a description, a large portion of Europe became gradually covered with ice, and many species unable to defend themselves against the cold perished, whilst man, by his industry and intelligence, contrived to escape this wholesale destruction. By striking flint against flint, to fashion his primitive weapons, man perceived the rising sparks, he learned to retain them, and the fire first kindled for his rude feasts, became afterwards his protection against the inclemency of a glacial climate.

We possess at present but one testimony as regards the existence of man at the period of the extension of the glaciers, which gives at the same time evidence that he then possessed the use of fire.

The soil in Sweden is at present in several regions the seat of a gradual upheaving, whilst in other regions it gradually sinks, and these imperceptible oscillations had already commenced before the

glacial period. Large tracts, formerly inhabited, disappeared beneath the waters of the Baltic, the sea had covered them with sand and shell banks; large floating islands detached from the glaciers of the Scandinavian Alps ran aground upon these shoals. When now the time arrived for the fusion of the glaciers, the erratic blocks which they had transported sank to the bottom, and the waters again covered its banks with shells. Then the soil so long submerged again began to rise. The erratic blocks first rose above the level of the sea, after them appeared the shell-banks, then the sand-banks, and finally, the primitive soil emerged in turn after a period of submersion of which it is impossible to estimate the duration.

How much time was not required before this region emerged from the sea could have become habitable, before the thick shroud of sand which rendered the surface sterile, was covered with humus, in order that man should find his means of subsistence, have prospered and multiplied beyond measure, so that Scanzia was called by the ancients the great workshop of peoples, *Scanzia officina gentium* (Jornandès)! And nevertheless, this period is very short compared with that which has elapsed from the commencement of the glacial period to the fusion of the ice. M. C. Martens has told you how the glaciers are formed and how they disappear. It is not an excessive cold which produces them; the conditions in which they formerly were formed in regions now temperate did not much differ from those which surround us. If they finished by invading the greater part of Europe, it was only at the end of a multitude of centuries, and they retired as slowly.

Well, then, man has witnessed successively these two changes of our hemisphere; he receded step by step before the advancing glaciers, until their retirement rendered to him gradually his ancient domain, though rent and torn up. In digging a canal in the vicinity of Stockholm one of the eminences, which are named *osars*, and which at the glacial period were by the floating ice deposited upon the submerged plains of Sweden, was cut through. There, beneath an enormous mass of erratic blocks, and below the sand and shell banks, at a depth of eighteen meters, was found a circular range of stones, forming a fireplace, in the midst of which there was charcoal. What hand was it that collected those stones, and kindled that fire, unless it was the hand of man? Man then existed before that long series of phenomena described by M. Charles Martens; and yet that date, so immensely remote, is but the second date of humanity. The first is that of the diluvium, and everything

induces the belief that it is more remote from the second, than the second is from the present period. To these irrefutable proofs of the antiquity of man, others may be joined which have for a long time been discarded by prejudiced minds, but the value of which you have always recognized. Frequently, both in Europe and in America, human bones, implements made of flint, bones, or stag horn, cinders and charcoal, have been found in caverns, mixed with the remains of animals of the quaternary period. M. Geoffroy St. Hilaire has justly observed that if the bones of any other animal than those of man had been found under similar circumstances no one would have dreamt to deny their antiquity. But he adds, as the co-existence of man with the extinct animals could not be admitted without undermining a doctrine so deeply rooted in science, as well as in theology, the mind was tortured to find reasons for non-acceptance; and the most various and sometimes extremely improbable hypotheses were imagined, to explain how these human bones were subsequently transported into these caverns. This was the opinion three years ago of the illustrious colleague whom we have lost. A few days after he showed us a staghorn arrow, found by M. Alfred Fontan in a cavern, where also two human teeth and the remains of several extinct animals were found. This arrow, notched at the edges, presented upon one of the surfaces little grooves, probably as M. Lartet supposes for the reception of poison. This fact, accepted by so cautious an observer as M. Geoffroy St. Hilaire, by so expert a geologist as M. Lartet, has greatly struck you; and when afterwards you heard of the human skulls found by M. Schmerling and M. Spring, in the caverns about Liège, of those found by Mr. Aymard in the osseous breccia of Mont Denise, of those found by M. Lund in the caverns of America, you evinced no incredulity; but you would perhaps have evinced greater hesitation if the discovery of M. Boucher de Perthes had not previously prepared you for accepting these multiplied evidences in favour of the antiquity of man. It must be confessed that the prejudices prevalent some years since, among all classes, and even among scientific men, were of such a nature that they could only be removed by an accumulation of evidence.

In order to remove these prejudices it was not sufficient to show that human remains are frequently intermixed with the bones of so-called antediluvian animals; for it was objected that man might have entered the osseous caverns long after the extinction of these animals; that ferocious beasts, subterraneous currents might subsequently have imported fragments of his skeleton, or that they might have been

introduced by crevices; and when it was shown that, applied to some special cases, all these interpretations were false, there remained yet that intangible objection, that some unknown cause may have disturbed the soil of the caverns. A question thus put could only be solved by a different mode of investigation. It was now requisite to search for the traces of man no longer in caverns, of which the evidence was rejected, nor in the osseous breccia, but in the quaternary formations, *in situ*, in beds which neither were nor could have been disturbed, since they have preserved their relations with the superficial and lower strata. It was then that M. Boucher de Perthes commenced in the diluvium of the Somme those long and difficult researches of which he has given you a history, in his letter of the 17th of November, 1859.

It is in this ancient and deep bed, which has remained undisturbed for a frightfully long series of centuries, that he, and so many after him, have found the flint implements used by man in combating the monsters of another period, intermixed with the remains of the rhinoceros and the mammoth.

This time the demonstration was complete; but to render it more palpable, more striking, and to render it safe from the last objection of sceptics, a crowning proof was required; it was requisite to discover in the fossiliferous diluvium not merely the remains of man's industry but the remains of his body. None of you doubted that ultimately this final evidence would be produced. Yet years elapsed without your expectation being realized. Who was to be the happy explorer whom chance would enable to ally his name with the discovery of the fossil man? Gentlemen, there is justice sometimes in destiny; this good fortune was reserved to the man who has devoted twenty-five years of his life to the demonstration of one of the greatest truths in science, who, for a long time railed at, or what is worse, treated with contempt, had to struggle against universal prejudices, but who by his perseverance and courage received first some tardy support, until at last this depressed truth broke forth in science. M. Boucher de Perthes has the glory of having finished the edifice of which he has laid the first stone. What must have been the joy of this venerable man, when he was called upon to extract from the diluvial bed the celebrated human jaw which our learned president has some days since shown you. The clear and complete exposition of M. de Quatrefages, the history of the objections raised in London, and which have ended in the formation of an international commission, all this has produced in you a profound conviction of the authenticity of the

fossil jaw; and you have remembered with pride that M. Boucher de Perthes has been for three years one of the six honorary members of your society.

Gentlemen, when, four years ago, some of us formed the project of founding an anthropological society, doubts were raised as to the possibility of success; we were threatened with the indifference of the public. We were, however, not discouraged, and we were right. We were then nineteen; we are now two hundred. Let us then proceed resolutely.

As for myself, gentlemen, I must apologize for having so long occupied your attention; but I cannot quit this tribune without thanking you for the honour you have done me by appointing me general secretary. You might have chosen a worthier, but not a more devoted one.

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## ON THE SUPPOSED INCREASING PREVALENCE OF DARK HAIR IN ENGLAND.

By JOHN BEDDOE, M.D., F.A.S.L., &c.

FOREIGN ASSOCIATE OF THE ANTHROPOLOGICAL SOCIETY OF PARIS.

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It is the opinion of some scientific,\* and of many unscientific observers, that light hair is gradually becoming less common in England than it used to be; and, while some confine the bearing of this statement within the limits of their own lifetime and observation, others extend it to previous centuries, attaching great importance to the terms in which our Saxon, Danish, and Norman† ancestors are described as having red, yellow, or other light shades of hair.

I do not wish to discuss, in the present article, the question whether this opinion has any foundation in fact. Some light might be thrown upon it by a careful examination of the national and other portrait galleries; and I incline to think that the portraits of the worthies of the sixteenth century would lend some little support to the notion. I merely wish to point out that if the fact be so, or so far as it is so, it may be accounted for by other causes than those which have usually

\* *E. g.* of Mrs. Somerville, *Physical Geography*.

† Dr. Bird, of Swansea, informs me that the chapel of the Anglo Norman garrison at Brecon was anciently known as "the chapel of the red haired." This is a rather striking fact, as red hair is not uncommon among the South Welsh themselves at the present day.

been assigned to it. In the first place, the large towns, and other more civilized and populous parts of England, have for some time past been receiving constant streams of immigrants from Ireland, Wales, Damnonia, the Highlands, and other Celtic districts, in which dark hair abounds. In the second, I am disposed to think that the xanthous temperament, though probably better adapted to the climate of these islands than the melanous, is less able to endure some of the anti-hygienic agencies which operate on the crowded populations of our great towns; and that thus the law of natural selection operates against its multiplication. And, in the third place, as a large minority of women live and die unmarried and without offspring, it is probable that the physical qualities of the race may be to some small extent moulded by the action of *conjugal* as well as of natural selection. In order to test the tendency of this hypothetical influence, I have extracted from my note-books particulars of the social condition (*viz.*, whether married or single), and of the colour of the hair, of 737 women, aged between twenty and fifty, who came under my observation at the Bristol Royal Infirmary: these I have thrown into the form of a table, which will, I hope, be sufficiently intelligible.

Social Condition.	COLOUR OF HAIR.					Total Number.	Per Cent.
	Red.	Fair.	Brown.	Dk. Brown.	Black.		
Married* . . .	22	52.5	145	234.5	20	480	65
Single . . .	10	35	73.5	73.5	6	198	27
Doubtful† . . .	1	7	21.5	28.5	1	59	8
Totals . . .	33	94.5	240	336.5	33	737	100

The indications of the above table may be rendered more clear by the following one, in which I have assumed the number under each colour to be 100, and have reduced to percentages the different conditions in each class.

Social Condition.	COLOUR OF HAIR.				
	Red.	Fair.	Brown.	Dk. Brown.	Black.
Married . . . . .	67	55.5	60.5	69.5	79
Single . . . . .	30	37	30.5	22	18
Doubtful . . . . .	3	7.5	9	8.5	3
Totals . . . . .	100	100	100	100	100

\* Including widows.

† These were persons who described themselves by their occupation only: they were probably for the most part either single women or widows.

Lastly, still further to simplify the matter, we may throw together the red, fair, and brown classes under the head of "blonde," and the dark-brown and black under that of "dark," of which two the former will include 367 women, and the latter 369. The results will be as follows:—

Social Condition.	BLONDE.		DARK.	
	Number.	Per Cent.	Number.	Per Cent.
Married . . . . .	219.5	60	260.5	70.5
Single . . . . .	118.5	39	79.5	21.5
Doubtful . . . . .	29.5	8	29.5	8
Totals . . . . .	367.5	100	369.5	100

The deduction I should make from these figures is, that, whether because the mass of the population does not sympathize with the preference which artists and poets have always manifested in favour of fair hair, or from some other cause, fewer of light-haired women than of dark-haired get married in this part of England.\* Then if during several generations this should continue to be the case, is it not probable that the relative proportion of the favoured colour would considerably increase, in accordance with the laws of hereditary influence?

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## ON THE ABBEVILLE JAW.

By A. DE QUATREFAGES,

MEMBER OF THE INSTITUTE OF FRANCE; PRESIDENT OF THE ANTHROPOLOGICAL SOCIETY OF PARIS; HONORARY FELLOW OF THE ANTHROPOLOGICAL SOCIETY OF LONDON.

TRANSLATED BY GEORGE FREDERICK ROLPH, Esq.

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WHEN I was informed of the discovery which M. de Perthes had made, I speedily proceeded to ascertain the facts of the case as soon as it was possible to leave Paris. At Abbeville I had the good fortune to meet with Dr. Falconer, the eminent English palæontologist, who had arrived there before me. With this competent and highly qualified

\* In some young women the hue of the hair continues to darken after they have overpassed the twentieth year, though in others it attains its maximum of darkness within a very few years after puberty. I mention this fact because it may, and probably does, account for a part of the difference between the proportions of the married in the several classes.

judge, who had already studied the question, I visited the place of discovery. The description of inquiry which we carried on together, led both of us to an identical conclusion. We have both accepted as incontestable the facts which M. de Perthes has announced. Nevertheless, we left with the intention of subjecting the specimens themselves to a further examination. It is distinctly understood that I leave the geological question on one side. As I am not qualified to pronounce a personal opinion respecting the discussions which are still raised upon the subject of the diluvial soil of Abbeville, I entirely abstain from alluding to it. Speaking of the jaw found by M. de Perthes, I shall nevertheless employ the term *fossil*, which at present seems to me consecrated.

But up to the present time it appears to me certain that the jaw found by M. de Perthes rested in the bed he points out, and that it has remained there since the period when the chipped flints termed *hâches* were deposited beside it. Dr. Falconer had already obtained, with his own hands, one of these *hâches*, and I had found two placed at some centimètres from each other, and at fifty or sixty centimètres beyond the spot where the jaw rested, according to M. de Perthes. I have the honour to submit them to the inspection of the Academy.

But it appears to me impossible, according to the state of the quarry, that these flints should have been introduced there recently. They were taken from the soil after I had myself removed some rubbish which covered them; the spot where they were developed, under the pick of the workman, was at the bottom of a cutting so deeply excavated, as to render a fall of the soil imminent; one of them, at the moment when I perceived it, was yet half retained in the earth which the pick had not yet reached; finally, they were incrustated with the coloured matrix which covers the pebbles of the entire bed, and which is found on the jaw. Besides, when we examine microscopically the mode in which the matrix is distributed on the surface of one tooth yet in its place, we see that it adheres to it by fine granulations, exactly as on certain of the polished pebbles of the bed. Finally, Dr. Falconer has extricated a certain amount of the same matrix even from the cavity of the tooth and the alveoli. Such are the reasons which, independently of the precautions taken by M. de Perthes, lead me to regard the Abbeville jaw as authentic.

We understand the great interest which attaches to this human fossil in every point of view, and in particular in its anthropological aspect. As regards this point of inquiry, the only one which I shall here take up, I have not yet made more than a summary examination; but this examination has already led to some interesting results.

The Abbeville jaw is in a remarkable state of preservation. It does not appear to have been rolled. The extremity of the coronoid process is even intact. This fact would induce us to think that it has not come from very far, and inspires a hope that we shall find some other part of the skeleton to which it belongs.

M. de Perthes has requested that the matrix, which still adheres to some parts of the surface, should be treated with great care. He has, nevertheless, washed the extremity of the coronoid process and a part of the head of the condyle. Here we see that the brown tint which the rest of the bone presents has not penetrated deeply; gravel pebbles, carefully washed, have exhibited to me a similar peculiarity. The matrix conceals some details, especially on the internal face; but it nevertheless permits a nearly complete examination.

When we examine this jaw we are immediately struck with two peculiarities. The angle formed by the horizontal ramus and the ascending ramus is extremely open; the fourth molar,\* which alone is still in its place, is slightly inclined forwards. These two characters have been even slightly exaggerated in a drawing which was communicated to me at the time, and perhaps to this cause is due the attention which they at once awakened in me.

Can we here discern a race-character? Before commencing this inquiry, let us remark that in anthropology, as in zoology, the comparative osteology of races, as regards detail, is yet very slightly advanced. This is a new investigation, into which palæontologists, as well as anthropologists, will be obliged to enter, even because of the facts which place the history of man and that of animals in contact.

The openness of the angle of which I am speaking is one of those characters which are liable to variation on account of age and other circumstances, apart from individual peculiarities. Amongst the specimens in the Museum gallery, I have found that in an Esquimaux skull the angle was, perhaps, more open than in the Abbeville jaw; while in another head of the same race it was nearly straight. I have found besides, in various races, examples of equally obtuse angles and of analogous variations. A new examination and exact measurements taken on various individuals of different ages and races are here necessary.

Is the inclination of the molar a race character? Can we recognize in it particularly a sign of dentary prognathism? It is very easy to reply to this last question by examining the incisive alveoli yet intact. These denote a vertical implantation. The inclination of these in-

\* *M.* 2 of English anatomists. Ed.

cisors is certainly not different from that which is observed in the most markedly orthognathous races. This is an important fact, because it tends to resolve definitively a controversial point. Some anthropologists, amongst whom are found men whose science and judgment I equally respect, have thought that the negro races, that is to say the essentially prognathic races, ought to have been nearer to the primitive human type, and that the higher races have originated by progressive development, and are, consequently, subsequent to the negro.

But in 1861, in my Museum lectures, I endeavoured to demonstrate that our knowledge of the characters possessed by early man was scanty, vague, and conjectural; but that we could contra-indicate, with precision, some of the attributes which early man did not possess. Resting on the phenomena of atavism, and on philological facts, I believed myself in a position to affirm that the negro race had not been the first to appear; that the white, however high his pedigree might be traced, never numbered the negro amongst his ancestors. The orthognathism of the Abbeville fossil adds another and a more serious argument to those which I had then brought forth. The man to whom this jaw belonged, if the testimony of many eminent geologists is to be relied on, was contemporary with mammoths and rhinoceri, which are extinct. In any case, it remains at present the representative of the most ancient known races, and nothing in the disposition of its teeth reminds us of prognathism, this essential character of all the negro races, and which is perpetuated with so much persistence in the half breeds. I think, therefore, that I am still more authorized to repeat that the negro and the white represent the extreme modifications of a primitive type, which was placed at some distance between the two.

As for the inclination of the molar in the Abbeville fossil, it is certainly not a distinctive character. On the one hand, I have found analogous modification in several skulls of different races comprised in the Museum Collection. On the other hand, the inclination appears to me to have been produced accidentally. The molar which existed in front of that which is yet in place fell out during the life of the individual. The alveolus has been filled up by the process of ossification which in such cases occurs. It can be understood that, before this deposition of bone, the tooth placed behind this cavity could have been forced or diverted easily in the direction where the usual support has been removed. Dr. Falconer, with whom I had the advantage of examining the jaw, has been forcibly struck with the following

peculiarity. The edge of the angle of the jaw, and the hinder portion of the lower border of the horizontal ramus, instead of being vertical, curved slightly inwards. The inner side of the bone thus showed beneath the oblique line a kind of canal, or rather of large sulcus (*gouttière*), which extended almost as far as the chin, and markedly more pronounced than it was in a modern jaw, placed at our disposal by a dentist. I have searched for the facts on this point which might be found in our Anthropological Gallery. I have found very marked traces of inversion inside the angle of the jaw in a Bengalee, a Javanese, and a Bellovacian;\* indications only in a Lapp, a young Negress, and an Egyptian mummy. On the other hand, an aged Egyptian mummy and a New Caledonian exhibited this character very markedly, and in a Batavian Malay it is as marked as in our fossil, or scarcely in a less degree. In this manner, various human races exhibit nearly every degree of this character; but, at the same time, the character of inversion is presented in individuals of every race.† Undoubtedly, new comparisons are necessary to demonstrate the value and significance of these characters. To what results can these contrary statements lead us? Without desiring to be too positive, I at present recognize in them the effect of the action of the masseter which acts outwardly, and of the internal pterygoids which act inwardly. The relative weakness of these last explains very well why the masseter commonly predominates. Their accidental preponderance would lead to the habit of grinding the food, a habit often practised by aged persons.‡ As for the canal or gutter, this is merely an exaggeration of that which normally exists. Indeed, at the point is found the sinus (*fossette*) in which the submaxillary gland is lodged. The inflection of the edge of the bone merely renders it more striking and deeper. The same *savant* especially called my attention to the form of the condyle. The lower and inner edge of the head is actually here very slightly marked. Besides, the head is perhaps more rounded and broader outwardly than in ordinary specimens; but these peculiarities cannot be considered as essential characters. In the same race may be observed very great differences. In the Tahitians and the New Caledonians, the head of the condyle is some-

\* Classical readers will hardly need to be reminded that the *Bellovaci* were a tribe inhabiting the neighbourhood of Beauvais, in the present Département de l'Oise. ED.

† I learn that Dr. Falconer arrived at analogous results after comparisons which he made since his return to London. A. DE Q.

‡ This observation was made by M. Jacquart, aide-naturaliste of the chair of Anthropology. A. DE Q.

times almost triangular, with one of the sides of the angle placed outwards, and one of the angles inwards. Does not age, again, exercise an influence in this respect? I should consider so, from the great cavity which is presented by the sigmoid notch. We thus see how it is necessary to institute further studies and comparisons before we pronounce on the real value of the peculiarities of the Abbeville jaw.

Thanks to M. Lartet, I have been able to compare this jaw already with the median portion of an homologous bone, collected by him in the rubbish of the Aurignac cave, and with the body of the same bone discovered by M. de Vibraye in the grotto of Arcy. M. Pruner-bey has been good enough to unite with M. Lartet in the comparative examination which we have made of these precious remains. On all these points we have found ourselves of the same opinion. In the pieces which are common to all three bones, they present slight differences, but also resemblances. Thus, the gutter or canal of which I have just spoken, can be recognized on the Aurignac jaw, as on that of Arcy, although it appears perhaps a little less marked on the first. Here, also, we can only see the depression which I instantly recognized. As for the Abbeville jaw; it has appeared to all three of us to be that of an individual probably aged, undoubtedly of small size, or at most, approaching towards the medium size.

I shall add, that in this jaw, absolutely nothing tends to support the theories sustained by some bold minds, which make man to have been descended from the ape by means of successive modifications. This jaw is rather weak than strong; it entirely indicates man, and it has nothing of the *ferocious* physiognomy, if the expression is permitted to me, which the same part of the skeleton offers in existing races. Finally, it is easy to ascertain, between the lower jaws of individuals and of existing races, differences as great and as marked as any of those which distinguish the Abbeville jaw from many of the jaws in the Museum Collection. In other words, these differences, on every point, enter within the existing limits of variation.

It will be conceded that I only present the present note as a first sketch. The Academy has been able already to see that the anatomical and anthropological questions which this human fossil brings forth are numerous and delicate. To be resolved with exactitude, minute and prolonged researches are necessary—researches which I could not make in so short a time, and in the midst of pressing occupations. But I have thought that these few details would not be uninteresting. Without doubt, in a question so grave, a single fact, however well

demonstrated it may appear, cannot be considered to lead to a definitive solution. But I am convinced, there will be human fossils, as there are *hâches* chipped by the human hand. Since attention has been drawn to these last, they have been discovered, not at Abbeville alone, where M. de Perthes had first found them, but everywhere. Now that the existence of human remains in the same beds seems to be placed beyond doubt, we shall not fail to discover other specimens, if they really do exist, provided we search for them. But whatever are the scientific riches brought to light, it would be a crying injustice to forget that it is to the ardent convictions, the indefatigable perseverance of M. de Perthes, that we owe this double discovery, one of the most decisively important which could be arrived at by the aid of the natural sciences.

Before reading the above note, M. de Quatrefages placed on the table the jaw which is the object of the communication, and which M. Boucher de Perthes had confided to him; two *hâches* which he had extracted with his own hands, one from the rubbish made by the workman, one from the actual side of the quarry worked in his presence, and which yet bears a covering of the matrix which can be seen on the jaw; finally, a box filled with this matrix. He further announced, that M. Chevreul had kindly consented to analyze the composition.

HUMAN JAW DISCOVERED AT ABBEVILLE IN UNDISTURBED EARTH.

—NOTE FROM M. BOUCHER DE PERTHES.

*Communicated by M. de Quatrefages.*

A long experience having taught me that one of the causes which prevent the naturalist from discovering human remains in the soils which he explores is the practice which the excavators have of allowing the remains to be lost, I have for several years offered a rather large reward to those who might bring me any, promising to double the recompense if they showed me these remains before they were disturbed, or in the place where they had been discovered. From this moment, many were presented to me; others were pointed out to me which I went to examine *in situ*. In these remains there were some very ancient, some very curious, but none that were fossil.

Towards the end of 1861, in excavating in the sand of Moulin-Quignon, a bed situated near Abbeville, at thirty metres above the level of the Somme, I remarked at four to five metres below the soil a bed of brown sand underlying the upper bed of yellow or grey sand, and reposing on the chalk. This argillo-ferruginous bed, nearly black, impregnated with a colouring matter which stuck to the fingers, and

which should contain organic matter, varies from thirty to sixty centimetres in thickness; it is distinct from the upper bed, and follows all the undulations of the chalk on which it lies at a depth of four to five metres from the surface.

During the year 1862 and the first months of 1863, as the quarry of Moulin-Quignon remained open, I was able to study this bed, and I found therein many flints chipped into implements, some very coarse and different by their colour and by their cutting, from those of the upper bed; the others much better made, seldom rolled and little worn, a fact which I attribute to the bed being less pebbly than that immediately above.

The state of preservation of these *hâches*, due to the absence of large flints in this bed, and as I have said, a certain indication of organic matter, led me to hope to find therein bones or skulls. I said so to the *terrassiers*, repeating my direction to them to leave in its place anything they might discover.

On the 23rd of March one of these *terrassiers*, Nicholas Halatre, brought me, in a mass of sand, two flint *hâches*, found at a depth of 4.50m. At fifteen centimètres lower, near the chalk, there was in the same sand a fragment of bone, or what he took for one, but which, after having detached the matrix I recognized as a human tooth. Half an hour afterwards I was at Moulin-Quignon, and saw the place whence the two *hâches* and the tooth had been derived; and the report of Halatre was confirmed by the other *terrassiers*. From the discovery of this tooth I might have concluded that the jaw was at hand; I had the earth opened, and found a third *hâche*, but night coming on interrupted my investigations. The following day, the *terrassiers* being employed elsewhere, the work was suspended.

On the 26th, I engaged two other workmen, Dingeon and Vasseur, to continue the digging.

On the 28th Vasseur came and brought me a second tooth, found not far from the place where the first had been discovered, adding that by its side was a bone, or something like one, of which he could only see a small part. I immediately went to the quarry, accompanied by an archæologist of our town, M. Oswald Dimpres, a skilful draughtsman, and well known to the geologists who have visited our quarries. Arrived at the bank, after having found the excavation just as I had left it, at five metres below the soil, I perceived in the black bed the end of the bone which Vasseur had mentioned. This earth was very compact, and it was necessary to be careful, in order not to do any mischief. I caused the soil around the bone, of which

I saw the extremity, to be detached, and in spite of a mass of sand which adhered to it, I recognized the half of a human jaw. At twenty centimètres distant, in the same black vein, was a *hâche*, which M. Dimpre could only detach after several efforts, and by the help of a pick-axe. Near the jaw I found a second *hâche*, broken, and, below this, a third tooth. Then, in a quantity of the same sand which I had carried home I discovered a portion of a fourth tooth. This human jaw-bone was in the lowest part of the bed of black sand, and at some centimètres from the chalk. The following is a detailed account of the beds which covered it, measured by me, and a diagram of which was made by M. Dimpre:—

	m.
1. A bed of vegetable earth - - - - -	0-50
2. Earth undisturbed, grey sand mixed with broken flints -	0-70
3. Yellow argillaceous sand, mixed with large or little rolled flints, superposed upon a bed of grey sand - - -	1-50
4. Yellow ferruginous sand; flints smaller, and more rolled; below which is a bed of less yellow sand. I have found in this bed fragments of the teeth of <i>Elephas primigenius</i> , and flint <i>hâches</i> - - - - -	1-70
5. Black argillo-ferruginous sand, colouring and sticking to the hand, appearing to contain organic matter; small pebbles, more rolled than in the higher banks; flints cut by hand; fossil human jaw - - - - -	0-50
	4-70
6. A bed of chalk, upon which the bed of black argillaceous sand rests, at a depth of five metres below the surface.	

It is then in the fifth bed, a bed covered by four other beds of sand and clay mixed with flints above it, where was found this jaw, which struck me at first by the perfect similarity of its black tint with that of the *hâches* found beside and below it, and the rolled or uncut flints by which it was surrounded. At first sight this jaw appeared to me to present certain differences from an ordinary jaw. M. Jules Dubois, physician to the hôtel Dieu at Abbeville, and M. Catel, surgeon-dentist, a good anatomist, to whom I showed it, made the same remark. M. Jules Dubois found that the ascending branch was more oblique from back to front than in a man of our day; and that the condyle itself is distorted in the inside, and somewhat low. His conclusion was that this man belonged to another race than ours. His confrère, Dr. Herquet, known, like M. Dubois, by his excellent memoirs upon natural and medical science, shared this opinion, adding that the difference from the ordinary form might be an

anomaly, but that it was so decided as to deserve attentive consideration.

I add here a diagram of the fossil jaw, and a section of the bank at Moulin-Quignon, made under my superintendence by M. O. Dimpre, and from measurements taken by myself. As the first tooth found is a left molar, and as I have only the right part of the jaw, I am now searching for the other half, and am continuing the excavation at Moulin-Quignon. In a few days I shall send the jaw, with any other specimens I may find, to Paris, that I may assist this report by exhibiting them to the members of the academy.

Since the reading of my first notice on the human jaw found by M. de Perthes, in the diluvium at Abbeville, I find that grave doubts have arisen as to the authenticity of this discovery. This circumstance induces me to particularize some facts which I only alluded to in my preceding communication. I wish it first to be observed that, among the persons from whom these doubts have emanated, not one, as far as I know, has personally studied the object upon which the discussion turns.\* The greater number have not even seen it. It is upon the examination of the *haches* taken from the bed when the jaw was found that nearly all the objections rest. It is affirmed that those of the *haches* which have been taken to England have all turned out to be forgeries. We are assured, in fact, that flint *haches* have now become the object of a fraudulent ingenuity, and that several celebrated *savans* have been duped by snares laid for their scientific curiosity and good faith. But because one or more of these *haches* have been discovered to be forgeries, does it follow that all are equally so? To reason thus would be equivalent to denying that there are in the environs of Rome medals really authentic or veritable antiquities, because the art of counterfeiting them had been carried to such an extent as sometimes to deceive the most skilful connoisseurs.

In a question of a discovery of this kind each object demands a separate examination, and its authenticity or falsity results from two orders of facts: from the circumstances themselves in which the discovery was made, and the conditions in which the object found

\* I ought to except Dr. Falconer. I have just received the *Times* of the 25th of April, and I find there a letter, in which that *savant* declares himself convinced of the fictitious character of the fossil of Abbeville; he now only sees in all this affair a lesson of prudence and of circumspection. He arrives at these convictions from the examination of the *haches*, and of a tooth also found in the quarries at Abbeville. But they do not rest upon a *new study of the jaw*. Thus, whatever weight the decision of a judge of Dr. Falconer's position may have in my eyes, I find nothing to alter in the actual remark, written before the receipt of his article in the *Times*.

was placed; then from the proper characters of that object. It is from this double point of view that I wish first to examine to-day the two *haches* that I have brought from Abbeville.

Having returned to the spot with Messrs. de Perthes and Falconer, I descended into the quarry, and myself cleared away the few remains left at the foot of a slight excavation already made in the sand-bed. I wished thus to ascertain whether the bed where they were going to work had yet been disturbed. It seemed to me that it had not. Yet my examination was not so minute but that a small cavity prepared beforehand, and *in which a false hache might have been placed*, could have escaped me. I allowed then, I say candidly, a *possibility of fraud* to exist. The workman gave, in my presence, a certain number of strokes of the pick-axe, in deepening the excavation, so that a fall of earth would have been result of any want of solidity in the materials. The last strokes brought to light a *first hache*, which I hastened to pick up. This *hache*, found in the midst of the loose earth brought down by the workman, might have been fraudulently deposited in the soil before my arrival; for it was found in the midst of the loose earth, and I was not able to judge of the conditions of its deposit. *The possibility of a fraud* then exists again here. But, in raising myself, I perceived in the side of the quarry itself, *on a point which the implement had not touched*, a *second hache*. This one only showed *three or four centimètres* of its length; it was fixed in the gravel, which had evidently undergone no recent disturbance. In drawing it out with my own hands I knocked down a quantity of this gravel which was in immediate contact with it. Here, it appears to me, exist all the conditions under which a *fraud would be impossible*. The circumstances of discovery, then, establish a real difference between the two *haches*. Let us see what is indicated by the examination of their proper characteristics.

The first *hache*, that which had been picked out from the loose earth brought down by the workman, has been washed and brushed with the greatest care; and yet by the magnifying-glass it is seen that the matrix still adheres to the fractures of the edge. It shows ridges and cuttings almost as clear as if they had been made yesterday; its exterior colour differs very little from that of the chips obtained from it; and these, rubbed with the coloured matrix which surrounds the gravel-pebbles of the quarry, take almost the same colour.\* Lastly, its surface gives a dull reflection; and we scarcely find traces of

\* Yet, by a moderately powerful magnifying-glass, the points freshly broken are easily distinguished. Again, as will be seen presently, the colouring matter of this bed penetrates to a very small extent.

that species of patina, regarded up to the present time as a certain indication of a really authentic *hache*. Yet, placed by the side of a really false *hache*, the one in question is easily distinguishable. All these characteristics are found in certain specimens, the authenticity of which is beyond doubt. M. Gandry has presented some similar ones to the Academy, which he took from cuttings made in a virgin soil, and at a time when, as cupidity had not yet been excited, actual counterfeits had not been produced. M. Lartet has even told me that he has in his possession a *hache* which he regarded for a long time as false, and the authenticity of which was only ascertained by him when, by the use of a magnifying-glass, he discovered dendrites upon its surface.

Thus the *hache* in question is most probably genuine, but the conditions of its discovery admit of the possibility of a fraud; its own characteristics tend towards the doubtful. I will admit, then, provisionally, that it may be considered false; in doing so I certainly go beyond the truth. This *hache* is, at the most, doubtful.\*

The characteristics of the second *hache*, which I extracted from the side of the quarry, are different in certain respects. The ridges and cuttings are less clear; the exterior presents brighter reflections, as if beginning to be covered with patina; the fractures which I have made upon some points give decidedly duller reflections; yet the colour of the interior and that of the exterior of this *hache* are similar, or nearly so, in the parts where I have chipped it. But the flints of the same bed manifest precisely the same peculiarities. Another circumstance struck me forcibly, and I thought it at first a sign of recent fabrication. On one of the points where I had washed it, I found a moderately deep fissure, into which the colouring matter has not penetrated. But, in examining the flints taken from the gravel beds of the quarry, I found one which presents upon two points exactly the same feature. These two fissures, analogous to those upon the *hache* and most certainly ancient, do not show any trace of colouring matter. The circumstance which I have pointed out cannot, then, be regarded as a sign of spuriousness; † everything, on the contrary, indicates a perfectly genuine *hache*.

I have said that I had washed the *hache* in question in certain

\* M. Desnoyers, who has examined it with care, does not hesitate to declare it authentic. This *savant* has pronounced the same judgment upon other *haches* coming from the same locality, which M. de Perthes has kindly sent me.

† I do not know whether a comparative examination, similar to that which I describe, has been made by any of the *savants* who have repudiated all the *haches* taken from the bed in question; but I have found no indication of it in the communications which have been made to me on this subject.

places, but I have preserved the matrix upon the greater part of its surface; for, to practised eyes, this matrix itself ought to present characteristics of its own, which would facilitate the discovery of fraud if it existed. A minute examination, made by an expert, here became necessary. M. Delesse kindly undertook it. This competent judge has made a lengthened investigation of the *hache* in question, and his conclusion is that it appeared to him impossible to imitate that which he saw upon the *hache*. On various occasions I raised objections; I told him to be as strict as possible, and to study the *hache* with the intention of proving it spurious. He has repeated his investigation, and his reply remains the same. Thus, in what relates to the two *haches* that I have brought from Moulin-Quignon, I think I may conclude, that, if one of them may strictly speaking be considered doubtful or even false, the other presents every possible guarantee of authenticity.

The jaw-bone itself remains. What is to be thought of it? First, let us remark that this question is by no means so intimately linked with the preceding one as some persons seem to think. The *haches* may be genuine and the jaw-bone spurious, or *vice versa*. The spuriousness or authenticity of a medal found upon any part of the Roman Campagna is no argument for or against the authenticity of a bust taken from the neighbourhood.\* We must remark again, that, outside the geological controversies of which the soil in question is the subject, many causes would render it difficult to admit any fact analogous to that which M. de Perthes has announced. On the one side, the discovery of a human jaw-bone, which in its form and proportions completely resembles those seen at the present day, militates against the theories most ardently adopted and maintained by those *savans* who enjoy the highest and best deserved authority. On the other hand, men's consciences are quickly alarmed at seeing the existence of man brought back to an epoch for which there exists at present no possibility of a precise date. These two causes, very different and we might say opposite, have operated in the same manner, and are evidently to be added to doubts exclusively and candidly scientific.† In this state of things what is to be done?

\* What I say of the *haches* applies equally to the tooth, the examination of which has so forcibly struck the *savans* of London.

† But these doubts are not universal. Even during the printing of my paper, I learn that Dr. Carpenter, who has studied the jaw-bone at the house of M. de Perthes with great care, has not hesitated to declare its authenticity before the Royal Society. Communications to the same effect have been made to the Anthropological Society of London.

Evidently we can only do with the jaw-bone itself as with the *haches*, and look beyond every preconceived idea for the facts which militate for or against its authenticity. What I have endeavoured to do I will endeavour to do again. Unfortunately, one of the essential elements of the inquiry is in this case wanting. We cannot reproduce the conditions of the discovery; on this point we are all obliged to abide by the report of M. de Perthes. Without the least doubt in the world as to his perfect and incontestable honesty, his opponents may always deem it possible that he may have been deceived. So far as I am concerned, I cannot even pronounce an opinion; for, in a matter like this, to have the right to give evidence one must be able to speak *de visu*, and I was not present at the moment of the discovery.

There remains the examination of the proper characteristics. I have made upon this subject the only experiments at present allowed me. The following is a brief *résumé* of them. I have washed carefully, and rubbed with cotton, a portion of the exterior face. The bone then displayed a pale yellow colour, slightly tinged with brown. By the magnifying-glass it could be seen that the matrix has penetrated the small fractures on the surface, and that it continues to adhere to them. Some pebbles with white markings, found upon the spot, have, when treated in the same manner, shown the same peculiarities. This slight colouring of the jaw-bone is not, then, an indication of spuriousness. On the contrary, it proves that it cannot have been obtained from tumuli, which give to bones a similar colour to that of the Abbeville fossil before washing. I scratched the interior face of the bone and some whitened pebbles, in a similar manner, with the point of a small scalpel. The tool-scratchings have produced almost the same results, allowing for the differences of hardness in the two bodies. I examined very carefully the mode of adhesion of the matrix to the pebbles and to the jaw-bone, and found it in most instances identical. The manner in which this matrix crumbles and falls away in working under a magnifying-glass seems also exactly the same in certain pebbles and in the jaw-bone. On the other hand, some cut flints were carefully washed, and then covered with a stratum of composition made of the slimy matter found in the quarry. This adhered at first, but without showing the characteristics observed on the jaw-bone, on the *hache*, or on the pebbles referred to. Then, when dry, this artificial stratum was readily detached and crumbled in a different manner. Lastly, I handed the jaw-bone to M. Delesse for examination, as well as the *hache* above referred to. This *savant* found in both matrices the same characteristics. In each case he gave as his im-

pression:—"It appears to me impossible that this can have been artificially formed."\*

Thus, nothing has yet appeared to confirm the doubts raised as to the authenticity of the jaw-bone of Abbeville. On the contrary, everything tends to support the account of M. de Perthes as to the circumstances of its discovery. But, I am most willing to acknowledge, these researches are not yet finished. The entire jaw-bone must be washed and the water examined, in order to see if anything is contained in it which would cause the matrix to adhere to the surface. A portion, at least, of the bone must also be analyzed for the purpose of ascertaining its composition.

All these experiments must be made comparatively. The last, especially, will only be of use, if another fragment of bone taken from the same or a precisely similar stratum be analyzed at the same time. It is well known how much the preservation of bones depends on the composition of the soil; and of this I am myself able to give a striking example.

In two places in Alsace at some distance from each other, in the environs of Schelestadt and Birchwiller, are found tumuli which, from the nature of their contents, are known to be of the same period and to belong to the bronze age. The first, I have heard, are in a peaty soil; the second, which I have seen, are in a soil entirely sandy. In the excavations near Schelestadt, entire skeletons have often been found with their most delicate parts in a complete state of preservation.† But in the excavations made in my presence three years ago in the forest of Schirein, the almost entire absence of bones was generally remarked. In one of these old tombs was found an entire set of female ornaments, consisting of a girdle, necklace, bracelets, and ear-drops, disposed almost as when they were buried upon the body. But all that remained of the skeleton was a silicified fragment of one of the temporal bones; the rest was decomposed.

From this fact we can understand that, for a case like the one in question to be conclusive, the chemical analysis should be made at the same time upon the disputed object, and upon another of the same nature, which is undoubtedly authentic, and which may be used for the purpose of comparison. Yet even an isolated analysis of the

\* M. Lartet took part in this investigation. Like myself, he several times requested M. Delesse to use the strictest scrutiny.

† Unfortunately none of these skeletons, nor even the skulls, have been preserved. Let us hope that the time will come when archæologists will know that the bones from these ancient tombs are as valuable to science as the specimens of brass and ironwork. But how many anthropological treasures have been lost, even in consequence of the ardour of the students of antiquity!

Abbeville jaw-bone would possess real interest, and might afford presumptive evidence. I hope, therefore, that M. de Perthes will shortly permit a piece of this bone to be detached, and even that he will allow it to be separated from its matrix. His well-known love of truth affords us a sure guarantee of this. But we can understand that before this is done he desires that the present condition of the jaw-bone shall be proved by the greatest possible number of witnesses; for this, once destroyed, cannot be reproduced, any more than can the circumstances of its discovery.

(This paper was written when I received the accompanying letter from M. Delesse, who responds to the desire I had expressed, after he had examined the above-mentioned remains.)

*Letter from M. Delesse to M. de Quatrefages.*

I believe I recollect that you asked my opinion of the curious fossils which have lately been found at Moulin-Quignon. It appears to me that the flint hatchets, and especially the human jaw-bone are really authentic. Their surface is encrusted with a brown magnetic limonite, presenting in some points a metallic lustre in such a manner that its deposition points out an inimitable action of nature herself. On the jaw-bone as on the worked flints, this limonite cements together clay, pieces of flint, and rounded grains of hyaline quartz. The fossils which have been found were evidently similarly deposited. They were enveloped in the brown clay which you have pointed out as lying near the bottom of the diluvium at Moulin-Quignon.

THIRD PAPER ON THE ABBEVILLE JAW-BONE.

*By M. de Quatrefages.*

The last paper which I had the honour of reading to the Academy respecting this human jaw-bone extracted by M. de Perthes from the Abbeville diluvium, appears to have been interpreted by some persons in a manner which I desire to rectify. It was considered as a proof of my doubts of the authenticity of the discovery. I hope that the attentive reading of my paper will already have shown how little my ideas upon this subject were understood. My first convictions, far from being shaken by the minute and oft-repeated experiments which I made upon the *haches* and jaw-bone, have only been strengthened. The misunderstanding which I am endeavouring to clear up, doubtless proceeds from the general tone of the two papers which I have had the honour of presenting to the Academy. In fact, at the time of my first communication I was not yet aware that all the *haches* brought from Moulin-Quignon had been declared spurious or doubtful, and

that, in consequence the authenticity of the jaw-bone itself was a subject for denial. I confined myself, then, to pointing out the motives which led me to the admission of that authenticity, and to dealing with the anthropological question, which at that time was evidently of paramount importance. But, from the moment when doubt was thrown upon the authenticity of the subject of this study, I have been obliged to endeavour to furnish proofs of it. Now, in a question of this nature, I consider that the man of science should not act like a counsel who brings forward only the facts and arguments favourable to his cause. He ought, on the contrary, to conduct his observations with all the severity that his adversaries themselves could bring to bear upon the examination, to put before his readers the *pro* and *con*, and place them in a position to judge for themselves. This is what I have endeavoured to do; but at the same time, I have very clearly established my own conclusions, viz.—That all my researches resulted in a confirmation of the facts related by M. de Perthes.

I have had the pleasure of seeing my convictions shared by all those who have been themselves willing to verify the facts upon which they rest. M. Delesse, at the close of a second investigation, longer and more minute than the first, remained entirely convinced of the identity of the matrices which covered one of my *haches* and a part of the jaw-bone, of the antiquity of this matrix, and of the impossibility of imitating it artificially. MM. Desnoyers and Gandry have acknowledged the jaw-bone as perfectly authentic, as well as the two *haches* which I brought from Abbeville. MM. de Vibraye and Lyman, who have just been studying flints in Denmark, have expressed the same convictions. M. Pictet, after having examined the jaw-bone with the greatest care, has declared to me that he did not expect to “find in it such marks of genuineness,” and has authorized me to repeat before the Academy that he left with an entire conviction of its authenticity. To these testimonies, which begin to counterbalance those hitherto opposed to me, I will add a few brief considerations.

And we will first notice that the greatest objection which has been made to the authenticity of the jaw-bone rests upon the examination of a tooth which has been found, it is said, very white, and preserving at least a great proportion of its original gelatine. I have partly replied before-hand to this last argument. It is evident that the conditions under which any portion of a skeleton is placed would have considerable influence upon its state of preservation. It is evident also that the texture of the part itself exercises an analogous influence. Now, in the whole skeleton no part is so well protected

as the teeth, against the action of external agents. The presence of gelatine, if I am not mistaken, has been demonstrated in various bones, properly so-called, belonging to fossils much more ancient than those of the diluvium can be by any possibility. Would it then be strange that a tooth derived from this latter deposit should still preserve a considerable portion of its first organic substance? Here, perhaps more than ever, the comparative analysis which I mentioned in my preceding paper would have been necessary to authorize the investigators to regard as recent the object experimented upon. Now, no such analysis, that I know of, has been made; the conclusion then being drawn from an isolated observation, is wanting in a positive basis, even when applied to the tooth which has been put in evidence. But, if we admit for the moment that within these limits the conclusion, which yet I do not look upon as legitimate, be well founded, how would this result authorize us to declare that the jaw-bone itself is false? The tooth examined in London does not belong to the jaw-bone. That was a fact proved previously to any discussion. We cannot, therefore, argue from one to the other. Much more, it appears from an account which M. de Perthes has given me, that he himself was in doubt upon the subject of this tooth; and he assures me that he has never been willing to answer for it. How, then, can we derive from this tooth, to which exception has been taken beforehand by M. de Perthes, serious arguments against the authenticity of the jaw-bone. Those who deny that authenticity again fall back on the slight colouring of the bone, and the small depth to which that colouring has penetrated. But these again are peculiarities which depend in a great measure on the composition of the soil, and the nature of the colouring matter. If this be insoluble it is clear it will stop at the surface of the bones, and not penetrate their substance.

I have already pointed out facts which prove that the colouring matter of the stratum here in question penetrates to a very small extent. The following is a still more remarkable case in point. In examining under a magnifying-glass a piece of the base of this bed, M. Desnoyers perceived a fragment, unfortunately very small and very thin, of what appeared to us to be a lamella of a tooth, or perhaps a fragment of shell. Whatever it may have been, this little flake was entirely buried in the coloured matrix. I raised a portion of this matrix, under the magnifying-glass, and merely with a pair of pincers, and the small substance in question was discovered almost as white as paper; at any rate, much less coloured than the bone in

dispute. The colouring matter has not even tinged the surface. How can we be astonished, after this, at the small amount of colouring in the jaw-bone.\*

One word more upon the subject of my second *hache*, that which I extracted from the solid side of the quarry. At the suggestion of M. Delesse I washed one of its ends, by pouring boiling water on it. A gravel pebble from the quarry was washed in the same manner. Both were cleaned with equal facility. It will be understood that if, for the purpose of causing an artificial matrix to adhere, gelatine or gum had been employed, either would have been easily detected upon the moistened surface of the matrix. Not the slightest trace was discovered. On the contrary, this washing brought to light on the *hache*, a point where the limonite forms a thin stratum, and follows the sinuosities of the flint, and presents that metallic appearance which so forcibly struck M. Delesse when he made the first examination of these objects.

The members of the Academy will see that in the kind of inquiry to which I have devoted myself I have only to notice to-day facts which are favourable to the authenticity of the Abbeville jaw-bone. Had facts tending to a contrary conclusion presented themselves I should equally have published them; but up to the present time everything argues in favour of its authenticity, and tends to confirm the reality of the discovery made by M. de Perthes.

#### OBSERVATIONS MADE ON THE JAW-BONE OF MOULIN-QUIGNON.

*By M. de Quatrefages.*

I beg leave of the Academy to add a few words to the report, otherwise so complete, of M. Edwards. I desire to unite with my honourable colleague in expressing the sentiments of profound esteem which I have been led to entertain with regard to the proceedings and entire conduct of the English *savans* during the few days that we have passed, so to speak, in continuous discussion. It is impossible to bring to bear on a debate of this kind a more disinterested love for science, or a more honourable feeling; or to accept with a more complete frankness facts which have once been established. At the commencement of our conferences conflicting opinions were held, with equal tenacity, and yet the strict minuteness which each one brought to bear upon the subject did not for a moment interfere with their cordiality towards each other; and I am so bold as to hope that this scientific contest has laid the foundation, among all those

\* I have preserved this small white substance still encased in its matrix.

who have taken part in it, of a sincere and lasting friendship. I ought to add that the discussion has fully brought to light a fact easily admitted, and which, for my part, I have never doubted. No one could have entertained the idea that men so eminent as Messrs. Falconer, Busk, Prestwich, etc., would lightly, and without serious motives, have embraced the opinions which they came to Paris to defend; and we can understand that the same causes would give rise to doubts in the mind of Dr. Carpenter. I also am willing to acknowledge that these causes existed. In the absence of any other means of judging, the external appearance of certain *haches* after washing, the remarkable preservation of the animal matter in the tooth examined in England, and the consequences which that preservation entailed, might well appear to be a sufficient cause of the conclusions arrived at by our London colleagues. In order to counterbalance the opinion which would result from the establishment of these facts, and to preserve and defend the contrary convictions, it is necessary to possess a thoroughly firm basis, and, so to speak, an absolute point of comparison. Now, these two elements were wanting in the case of our learned friends in London, whilst I had the immense advantage of possessing them. In fact I alone could be perfectly certain that one of my two *haches* was uncontestedly authentic; for I alone had seen it in its place in the undisturbed section of the quarry, in a place which the pick-axe had not even touched. Here, as I said in my second paper, all fraud was absolutely impossible. Henceforth, whatever were the proper characteristics of this *hache*, they could prove nothing against its authenticity. On the contrary, the study of these characteristics ought evidently to enlighten me as to the value of those presented by the other objects of the same nature, and by the jaw-bone itself; it ought, above all, to show whether the latter had been fraudulently introduced into the bed where M. Boucher de Perthes found it, or whether it belonged to the same period as that bed.

Now this study, minutely entered upon from every point of view, leads us to admit the contemporaneity of the *hache* serving as a point of comparison with the other *haches* of the same derivation, and with the human jaw-bone. I cannot, therefore, doubt the authenticity of this last.

It will be seen upon how certain a basis the opinion which I have defended rests. Without it, I do not hesitate to acknowledge, my first convictions would, doubtless, have been, if not changed, at least rudely shaken by the weighty facts opposed to them by such com-

petent judges as Messrs. Falconer, Prestwich, Busk, and Evans; without it, perhaps, also, the *savans* who were the first unhesitatingly to accept with me the authenticity of the jaw-bone, MM. Delesse, Desnoyers, Lartet, Gaudry, Lyman, and Pictet, would still have hesitated to give an opinion; and I am happy to thank them here for the confidence which they have testified in the accuracy of my observations.\*

But a reproduction of the same fact should have led others to an entirely similar result, and this has actually happened. Since our eminent colleagues from London have had the same elements of appreciation at their disposal, since they have seen *haches* extracted from the quarry—and, above all, established the presence of the *hache* No. 5 in the very sides of the working—since they have been able to compare the characteristics of that *hache* with those of the *haches* hitherto regarded by them as false or doubtful, they have adopted our opinion with the honourable frankness of which they have given proof during the whole discussion.

For the rest, even the discord which has separated us for some days will be very useful to science. "The trial of the jaw," Dr. Carpenter writes to me,† "will take a place among the *causes célèbres* of science." Now this trial has been conducted in such a way, that it appears to me impossible not to accept the verdict carried unanimously by a jury lately so widely divided. The authenticity, then, of the discovery made by M. Boucher de Perthes is henceforth beyond doubt.

OBSERVATIONS RESPECTING THE MEMOIR OF M. PRUNER-BEY,  
AND THE PAPER BY M. ELIE DE BEAUMONT.

For several years M. Pruner-Bey has been engaged in collecting materials for the elucidation of the characteristics presented by the most ancient race in Europe. He is then better able than any one else to take advantage of the discovery made by M. Boucher de Perthes. His labours were at first carried on entirely by the aid of photographs, which I had caused to be taken; but, seeing the importance of the results at which my learned colleague of the Anthropological Society had already arrived, I hastened to put at his disposal the jaw-bone of Moulin-Quignon itself. M. Pruner-Bey has kindly

\* M. Alphonse Edwards, who came to study these objects at my house after the reading of my third paper, also admitted their authenticity without any contradictory discussion.

† Dr. Carpenter, who besides has in no way officially mentioned the doubts he may have entertained, adopts all the conclusions of the meeting, and expresses to me his opinion upon the subject in a letter, for which I thank him extremely.

communicated to me in return that which served him as a point of comparison. We proceeded together to a detailed and rigorous examination, which has only served to bring out still more the exactitude of the appreciations of M. Pruner-Bey, and the truly surprising similitude between these two specimens, belonging, one to the stone, the other to the iron age.

The members of the Academy will certainly understand, from what has gone before, that the jaw-bone of Moulin-Quignon, looked at from an ethnological point of view, and with regard to the origin of European populations, possesses the highest interest. This interest, I repeat, is quite independent of the geological question. This is why I have endeavoured, from the commencement of these debates, and again at the last meeting, to distinguish clearly between the question of the authenticity of the jaw-bone and all those which I foresaw would arise from the discussions.

Thus my regret was very great when I saw that the report made no mention of the opinions expressed upon this subject by our illustrious perpetual secretary. Now that is all that I wished to show in my preceding communications; for that is what had been almost universally denied in Paris as in London. It will be understood, then, how important to me was the assent of M. Elie de Beaumont, and how sorry I was not to find any traces of it in the report. I trust that our illustrious colleague will only see, in the expression of this sentiment, another proof of the high value which I attach to his opinion.

May I be allowed to make another observation upon the subject of the paper by M. Elie de Beaumont?

This paper raises two questions, both new, and both entirely distinct from the question of the authenticity of the jaw-bone and the *haches* of Moulin-Quignon. Besides, these questions are, from certain points of view, very different from each other.

First, M. Elie de Beaumont declares that he shares the opinion of Cuvier, and does not believe in the contemporaneity of man with *elephas primigenius*. Secondly, he expresses the opinion that the drift worked at Moulin-Quignon does not belong, properly, to the diluvium.

The first of these questions, that of the contemporaneity of man with certain species of extinct animals, may be solved, it seems to me, apart from geological controversy. I therefore think myself allowed to have upon this point an individual opinion; I should state, that, after having for a long time shared the belief of Cuvier, I have arrived at a contrary opinion.

The second question, that which touches upon the age and origin of the soil of Moulin-Quignon, Menchecourt, Saint-Acheul, etc., is exclusively geological. Once more, I have no pretensions to deal with this last problem, and I intend to remain entirely aloof from the discussions which may arise from it. But for this very reason I must insist upon separating it very clearly from the two others, in order to prevent, as much as I can, a confusion which has evidently been produced in a great many minds.

EXAMINATION OF THE JAW-BONE OF MOULIN-QUIGNON FROM AN ANTHROPOLOGICAL POINT OF VIEW. BY M. PEUNER-BEY.

Considering the discordant views held by geologists in all that appertains to the deposit in which the jaw-bone was found, it will be desirable to inquire whether anthropological science will furnish us with the means of classifying it.

On a cursory examination, this object indicates by its proportions, and by the absorption of some dental alveoli, that it belonged to an individual of small size and of middle age; and I will add that this individual was most probably brachycephalic. The following is the series of facts which argues in favour of that opinion. M. Merlot (*vide Etudes Géologico-Archéologiques, etc., 1860*) showed in the section of the cone of la Tinière, near Villeneuve, three successive ages represented by stages. The lowest bed, representing the stone age, has yielded a brachycephalic cranium, as also have the beds belonging to the bronze age in the vicinity. Lastly, I have established the presence of this type in the iron age, and even among living individuals in the same localities, and I have traced elsewhere the detailed portrait of this type by which the history of man in our countries, according to our present knowledge, commences, without the type being extinct.

In the second place, the palæontological researches and discoveries made in France, though the number of data respecting man be very limited, in no way invalidate what I have just alleged. Thus the human chin-bone found by M. de Vibraye shows by the roundness of its contour that it does not belong to the Celtic race, and by its dimensions that the cranium of which it formed a part, was small, and consequently brachycephalic. The same may be said of the specimen the knowledge of which I owe to the kindness of M. Lartet. This celebrated palæontologist found this outer half-ramus of the lower human jaw in the cavern of Aurignac, associated with antediluvian animals, etc. This bone again strikes us by its smallness, which extends even to the three molar teeth which were implanted in it.

Our last fact appears to me to serve as a touchstone in this question as difficult as it is important. I have in my possession a small series of bones of the lower jaw, belonging to the brachycephalic type of Switzerland. These bones, which have been referred to the iron age, were extracted from an immense gravel tumulus, containing numerous *kistvaens*, in which were found skeletons and their remains for the most part Celtic, and by their side a few with brachycephalic crania, and of small size. Now, one of these last jaws, apart from the prolongation of its coronoid apophysis, corresponds in all its other details with the Abbeville jaw-bone. This applies not only to its form but also to its dimensions. Now if we consider the small amount of stability in the characteristics generally presented by this bone in individuals of the same race, and if we add to that the immense interval of time which separates them, I think I shall remain greatly within the limits of probability, if I presume to enunciate this:

First. That the jaw-bone of Moulin-Quignon belonged to a brachycephalic individual of small size, belonging to the stone age.

Secondly. That we can follow the presence of this race through several successive ages; and

Thirdly. That it has left recognizable descendants among the living inhabitants of the extreme north of Europe, following the western border of our continent as far as Sicily.

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### Miscellanea Anthropologica.

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*Egyptian Skulls found at Cologne on the Rhine.*—In the year 1847, on laying the foundations of a house near the Orphan Asylum at Cologne, there were found above sixty skulls, eighteen of which had on the right side large iron nails driven in. With them were found Roman vessels and coins of the pre-Constantine period. Professor Braun of Bonn, delivered an elaborate lecture on this subject in 1855, on the occasion of the celebration of Winkelmann's birthday, in which the Professor endeavoured to prove that the skulls belonged to the Martyrs of the Theban Legion, whose name was derived from Thebais in Egypt, and who were executed in 286 under Diocletian, the persecutor of Christians, because they would not fight against that sect. Dr. Mayer of Bonn expressed his opinion that these skulls presented all the characteristics of Egyptian skulls.

Within the last few days, there were found almost on the same spot near Weyer's Gallery, a number of similar skulls, some of which also had a large nail driven in on the right side. The Rev. Mr. Schaffrath

of Cologne, is in possession of one of the best specimens, which, as we hear, is to be sent to the Antiquarian Museum of Bonn. (*Cologne Gazette*, June 21, 1863.)

*Colonies and Climate—a Prophecy.* Extracts from a review of works on Public Hygiene, *British and Foreign Medical Review*, 1842. —“We behold the British race peopling alike the western and southern hemisphere, and can already anticipate the time when two hundred millions of men on the shores of the Atlantic and in the isles of the Pacific, will be speaking our language, reading our authors, glorying in our descent.” (*The Principles of Population, etc.* By A. Alison, 1840, v. ii, 348.)

Need we say that the responsibility of British statesmen and of the British nation, is most solemn? In two or three centuries a larger population than exists in the whole of Europe will curse or bless us according as we have given a bias for good or evil to their infant institutions. . . .

Taking a practical view of the high questions started, we should doubt much as physiologists, whether any system of public hygiene could effectually resist the influence of an enervating climate on man, or modify the thick neck and broad jaws of the Mongol so indicative of his destructiveness. It seems to us that the customs and habits created by climate induce changes in the cerebral organization of nations, as well as in the muscular and osseous formation, and that the mental and corporeal qualities which result from these changes becoming hereditary characterize the race.

Climate will, undoubtedly, change the character of the English race. It changes it in India; it is changing it in the United States, and in less than a century will dissolve the union.\* It is of importance, then, in marking the limits of new colonies, to consider the ultimate effects of climate, and place natural boundaries between them.

When the United States separate, the northern will coalesce with the Canadas, and these unitedly will constitute the dominant empire of the western continent, and perhaps of the world. These changes will hardly take place without wars, and the length and destructiveness of these wars will depend considerably upon the nature of the boundaries, and the compactness of the territories to be defended. Portions of our empire in India might be garrisoned by colonies. The climate of the high lands in Central Asia so nearly resembles our own (as do also the inhabitants themselves) that Englishmen would not deteriorate there; and would do more for the civilization of Asia and the glory of England, than the innumerable colleges and missionaries in Hindostan.

\* It must be remembered that this was written more than twenty years ago.  
EDITOR.

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ON CEREBRAL PHYSIOLOGY.

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No subject is perhaps of more importance and interest to the anthropologist than the researches which are made in ascertaining the functions of the encephalon. The progress made in cerebral physiology generally, will occasionally come under our review; and the approaching publication of a translation of the works of M. Gratiolet, and of Dr. Louis Büchner's *Kraft und Stoff*, will compel us to examine more minutely what is the exact state of our knowledge on this subject. In the meantime, we present our readers with a sketch of our present knowledge on some of the chief points of cerebral physiology, reserving some critical remarks until a future occasion.

*Chemical Composition of the Brain.* The investigations of Baron Bibra (*Vergleichende Untersuchungen*, etc., Mannheim, 1856) on the chemical composition of the brain of man and the vertebrata, led to the subjoined results. Bibra had always been of opinion that, though the physiological function of the brain did not altogether depend on its fatty constituent, yet that it was mainly conditioned by it. Experiments supported that opinion. Fat is an integral constituent of the brain, being closely connected with its functions, and does not perform the same office in the brain as in other parts of the organism. Even in diseases producing the greatest emaciation, the fat is not sensibly diminished in the brain. The average quantity of fat in eleven adult brains up to 48, amounted to 14·44 per cent. The medulla oblongata always contained most, the *thalami optici* and the *corpora striata* contained least fat. The average quantity of fat in six brains of very old men was but 13·13 per cent. Average quantity of water, 75·66 per cent. Generally speaking, those parts which have most fat have least water, and *vice versa*. The average of the

solid albuminous part amounted to 10·83 per cent., somewhat more than in young individuals, in whom it was 10·09 per cent.

From the circumstance that, after any laborious mental exertion, there are frequently found in the urine large quantities of phosphatic salts, coupled with the alleged fact that in the brain of the adult idiot the quantity of phosphorus is not larger than in the brain of a child, it has been inferred that phosphorus plays some important part in the substance of the brain and its psychical manifestations.

With regard to the quantity of phosphorus contained in the cerebral fat, Bibra arrived at the following results: That the quantity is nearly equal in man, mammal, and bird; that it neither is above the average in the brains of lunatics, nor does it vary much in advanced age. There is, however, more phosphorus in the grey than in the white substance. The quantity of phosphorus seems to depend on the quantity of cerebral fat. Bibra does not think that the quantity of phosphorus is relative to greater or lesser intelligence; though it is certain that the brains of higher animals contain a larger amount of fatty matter, and consequently a larger quantity of phosphorus. The fat has, no doubt, a physiological function as a whole; but it does not follow that the phosphorus specially influences the brain in its intellectual function.

It has been already stated, that the diminution of fat caused by wasting diseases in other parts of the organism does not extend to the brain. Fattening of animals does not increase the amount of cerebral fat. The human brain contains more fat than that of mammals, and the brain of mammals more than the brain of birds. The quantity of cerebral fat is rather less in old than in healthy adult individuals. The brains of mammals cannot be said to contain more water than the human brain; it seems that the lesser quantity of fat is replaced by a larger amount albuminous substance. The brain of birds contains a larger amount of water than that of man and mammals.

*Cerebral Circulation.* Considering that the brain is not merely the organ of the mind, but the source of energy of a considerable portion of the body, and consequently itself subject to great wear and tear, we might *a priori* assume that a large supply of arterial blood was requisite for its nutrition. And such is actually the case; for this supply is estimated at not less than one-fourth of the whole quantity of blood in the body, which reaches the cranium by four independent channels, derived from the chief trunk of the aorta, namely, the carotids and the vertebral arteries. The force with which the blood

is propelled by the left ventricle, may be estimated when we know that after decapitation the blood is projected from the carotids to a distance of five or six feet. But so delicate is the structure of the encephalon, that a circulation through the nervous tissue, in the mode as carried on in other organs, would be incompatible with its functions; hence the division of the large arterial trunks before they enter the brain.

Until a recent period, there prevailed an opinion that the quantity of blood within the cranium was constantly the same. The chief argument in favour of this theory was, that the cranium is a closed hollow sphere, with unyielding walls, filled with fluid. But the cranium is neither altogether unyielding, nor a closed cavity, being, as now proved, connected with the cavity of the spinal canal. Besides this, the cranial cavity is not filled by a simple incompressible fluid, but in addition to the brain by a watery liquid, the quantity of which is subject to constant changes, owing to resorption or secretion, and to afflux or reflux between cranium and spinal canal. Owing to this, and a variety of other circumstances, an expansion or contraction of the cerebral blood-vessels, and consequently an increase or diminution of blood within the cranium, is not merely possible, but must actually occur.

*Cerebro-Spinal Fluid.* Physiologists differ as to the importance and functions of this substance. Some have considered it as a *post mortem* phenomenon. This is now proved an error, as experiments on animals have abundantly shewn. Magendie, who was one of the first who called attention to this fluid, estimated its average quantity in the adult subject at sixty-two grammes; which Dr. J. Williams (*Lancet*, 1860) considers much below the average. "The clear fluid," observes Dr. Williams, "which sometimes escapes from the ear and nose in cranial fractures, is now proved to be the cerebro-spinal fluid." According to Magendie, the evacuation of this fluid very frequently plunges even the most vigorous animal into a state of complete inertia; and that any change in the quantity or quality of that substance produces well-marked disturbance in the animal economy.

According to Ecker (*Physiologische Untersuchungen, etc.—Physiological Researches in the Cerebro-Spinal Fluid*, 1843), the cerebro-spinal liquid is in constant motion, especially during inspiration. It is accumulated between the arachnoidea and the pia mater; it flows during inspiration into the fourth ventricle, and then through the *aquæductus Sylvii* into the third and the two lateral ventricles. This fluid has been found in considerable quantity in the section of para-

lytics. It cannot *a priori* be denied that its accumulation in the ventricles may disturb motion. "Perhaps," observes Ecker, "it is owing less to the increase in the ventricles than to its simultaneous diminution in the other parts of the periphery of the hemispheres of the brain and cerebellum. Removal of this fluid in animals by an aperture between the atlas and skull made animals lose their equilibrium; spasms and tremors occurred in the extremities; all which phenomena disappeared on the renewal of the liquid. It is clear, therefore, that the cerebro-spinal liquid is not merely a conservative provision, but influences both physical and psychological phenomena." The pia mater seems evidently the organ which secretes it from the blood on the surface of the nervous centres, and it then passes, by a mechanism unknown to us, into the cavities of the brain. Salt, introduced into the current of the circulation, a portion of the substance is soon found in cerebro-spinal fluid. In an inquest on Sam. Page, who died from excess of spirituous liquors, Dr. Bradley of Boston (U. S.) found on dissection a strong alcoholic odour in the fluid in the ventricles, recognized by every one of the jury. (*Amer. Jour. of Med. Science.*) The cerebro-spinal fluid favours the movements of the brain, and prevents any friction of so tender a body as the nervous pulp against the parietes surrounding it.

The long-pending question about the existence of a central canal in the spinal cord, and the fact of the intercommunication of the sub-arachnoid spaces, have been set at rest by the anatomical investigations of Luschka (*Die Adergeflechte, etc.—The Venous Plexuses of the Human Brain*, 1855). The spinal canal communicates above with the fourth, or, as Luschka calls it, the ventricle of the cerebellum, which again opens into the sub-arachnoid space through an aperture at the end of the *calamus scriptorius*.

The celebrated German physiologist T. Ch. Reil, in whose works many of the germs of apparently recent physiological discoveries may be found, had already conceived the plan of an anatomico-physiological comparison of the cerebral structure and mental activity of animals with that of man, with special reference to race, nation, sex, and age, both in the healthy and morbid state. The following invocation, preparatory to his dissecting a human brain, is so characteristic of this enthusiastic physiologist, that we have no hesitation in quoting it. "Direct my hand, Erato! that I may gently open the shell which covers the noblest production of creation. Arm my eye with acuteness, that it may intelligently examine the Dædalus of organization, which is the birthplace of history, the cradle of art, and

the mysterious bridal couch upon which body and soul, the gods of light and the children of nature, carry on their orgies." We may, indeed, safely say that a more complex and marvellous apparatus than the human brain is not to be found in nature. Its delicacy is so great, that six millions of its component microscopic filaments may be packed within a square inch; and yet, how wonderfully are the nervous fibrils interwoven! Will this labyrinth ever be displayed before the eyes of the investigator, like the works in a skeleton clock?

"We find in the brain," says Huschke,\* "hills and dales, bridges and aqueducts, beams and vaults, hooks, claws, ammon horns, trees, sheaves, harps, and tuning-forks. No one has yet explained the signification of these singular forms; and centuries may yet elapse before a Copernicus appears,† who may be able to regulate the solar and planetary tracts of our psychical organism."

No one at the present day denies that the nervous system connects all parts of the organism; and that the central organs, and specially the brain, are more or less concerned in psychical phenomena. The great object of cerebral physiology is, therefore, to trace this connection, or, at any rate, to find out how far the mental phenomena are the results or the concomitants of the nervous mechanism; and possibly to deduce some general principles, applicable not merely to the individual nature of man, but to humanity at large.

What are the changes produced by external impressions on the peripheral nerves, and how do they cause perception in some parts of the nervous centre? and how again are, from this centre, the motions determined? Where is the transition from the material impression to the spiritual conception? All attempted solutions leave us in the dark on this perplexing subject. We know the beginning and the end, but the connecting link is as yet hidden from us. The late Sir W. Hamilton, certainly the greatest polyhistor among recent British metaphysicians, considers the various hypotheses held by philosophers relating to the intercourse between mind and body, such as the system of assistance; the pre-established harmony; the theory of a plastic medium, which, partaking of the two natures of body and mind, can act upon both; and, finally, the theory of physical causes, as unphilosophical, simply because of their attempting to establish something beyond the sphere of observation; and he dismisses the subject in the following terms: "The sum of our knowledge of the connection

\* Schädcl, Hirn, und Seele (Brain, Skull, and Soul). Jena: 1854.

† Pourquoi l'histoire naturelle n'aurait-elle pas aussi un jour son Newton? Cuvier, Diss. Prél. Rev., p. 4.

of mind and body is, therefore, this—that the mental modifications are dependent on certain corporeal conditions; but of the nature of these conditions we know nothing.”

All this may be very true. The connection of body and soul is as yet a sealed book; still, science need not give up discussing this or any other question concerning the nature of man. Who can deny the possibility of science ultimately succeeding to trace and establish the laws governing our psychical life, in its connection with the physical organism? or are we to suppose that the connection is not subject to immutable laws like purely physical phenomena? The progress in this direction, and of cerebral physiology in general, has been necessarily slow; still, there has been a progress. The researches of Du Bois Reymond, Matteucci, Brown-Séguard, and other experimentalists, have at any rate made us better acquainted with the physical condition and mechanism of the nervous system. And this is a real progress; for we must first be better acquainted with the corporeal structure, before we can attempt to explain its connection with psychical phenomena.

Willis, who justly may be called the father of modern cerebral physiology, wrote thus in 1683 (*Discourses on the Souls of Brutes*): “Though we can discern nothing with our eyes, or feel with our hands what passes within the secret chamber of the brain, yet may we, by rationally comparing the effects with the working of the machine, at least conjecture what kind of functions are performed in some parts of the head.”

*Function of Convolutions.* Both anatomy and physiology lead to the inference that the convolutions, especially the vesicular grey matter which envelopes them, are connected with the functions of the mind, so that they have been called the intellectual centres. Whether certain convolutions possess those special functions assigned to them by the phrenologists is a different question altogether. A mere alteration of the vesicular grey surface is capable of producing mental disturbance. These convolutions are, according to R. Wagner, already developed in their main proportions about the eighth month; so that the brain of an infant at birth has the principal convolutions as perfect as the brain of an octogenarian. The convolutions differ greatly in individuals; in some they are very complex, and in others poor. The greatest differences occur in the convolutions of the frontal lobes. There are adult brains, which in their disposition resemble that of the fœtus in the seventh month. The frontal convolutions are less developed in the female brain. There are, however, male brains possess-

ing a female type, and *vice versa*. In most cases of great development of the frontal convolutions, those of the other lobes are equally so. Rich and complicated convolutions are generally considered as concomitants of intellectual power. Most brains of distinguished individuals have exhibited such a structure. The question is, however, far from being settled; inasmuch as in other brains of great thinkers, the convolutions seemed but little complicated. Instances of this kind are cited by Wagner in his latest researches on the functions of the nervous system.\*

And here we cannot omit mentioning the remarkable fact, that the brain, at least a considerable portion of it, the very organ which, so to say, converts the impressions into sensations, and would from its delicate texture be *a priori* supposed to be gifted with the highest degree of sensitiveness, is itself insensible; so that it may be sliced off without the animal evincing any feeling of pain. Just as there have been soldiers who have carried bullets imbedded in the substance of the heart, so have there been who have carried bullets in the brain without immediate fatal results; nor have they been much inconvenienced by pain, as proved by the following cases.

William Roberts, surgeon, in Carnarvon, Wales, reported the following case in the *Lancet*:—"Griffith Jones, still living in a small farm on the lakes of Llanberis, lost his eyes by an explosion of gunpowder, in a quarry; a hole was made above the inner canthus of the eye, in the frontal bone, from which a quantity of brain escaped, Mr. Roberts states that he moved the director in every direction, even straight to the cerebellum. Yet the man felt nothing, and completely recovered, with his intellectual faculties unimpaired."

Dr. Badeley (Lumleian Lectures) quotes the case of a boy, who, on a portion of his brain coming away through a fissure in the skull, consequent on violent injury, earnestly requested that it might be sent to his schoolmaster, who had often asserted "that he had no brains."

The following case, brought before the Medical Society of Ghent, is still more curious, for it is gravely stated that the loss of cerebral substance *improved* the intellect. A young man in Ghent lost by a pistol shot two teacups full of brain, and more at subsequent dressings. He lived for two years, with his intellect vastly improved, having before been of limited intelligence.

Paroisse (*Opuscules de Chirurgie*, Paris, 1806) received after the battle of Landrecies, in the hospital at Soissons twenty-two wounded soldiers. In all of them a considerable portion of the cranium, in-

\* Gottinger, Abhandl. Vorstudien, 1801.

teguments, and brain, had been cleanly cut off in battle, by sharp swords. All of them marched with their wounds thirty-five leagues, about five leagues per day, to the hospital. Ten of these soldiers, in whom the loss of bone, integument and brain was less, recovered completely within six or seven weeks. The remaining twelve were carried off in about three weeks. In none of these were the intellectual faculties much disturbed.

*Doubleness of the Brain, and alleged Duality of the Mind.* Some eighteen years ago, Dr. R. Wigan published an ingenious little work, in which he endeavoured to prove that each hemisphere is in fact a separate brain, and not only capable of a distinct process of ratiocination, which may or may not be carried on simultaneously in both hemispheres, but that each brain is capable of a distinct volition, thus establishing what he terms "the duality of the mind." The doctor further lays down that in a healthy encephalon one of the brains is almost always superior to its fellow, and thus capable of controlling its vagaries in thought, and preventing its volitions from passing into acts. He appeals to the experience of most persons of being at times conscious of two opposite volitions, so that it has given rise to the ideas of being possessed by a good or evil genius. This is, however, merely the war which the two brains carry on against each other, the stronger brain of course gets the victory. Hence it may be explained why in some cases patients subject to hallucinations are at the same time conscious that they see only phantasmas. It may then be assumed that one hemisphere is in a morbid state, whilst its fellow is in a healthy condition; in other words, one brain is mad, and the other brain is sane. Considering that the destruction of one hemisphere does not necessarily involve the abolition of thought, nor any decisive impairment of the principal intellectual faculties, it certainly seems no exaggeration in maintaining that we have two brains for thinking, as we have two eyes for seeing, and two ears for hearing. But here the following curious questions arise. Do we use both brains at all times, or do we on common occasions use only one hemisphere, as we use only one hand in writing and other handy work? May not the two hemispheres be in a state of alternate activity, so that one hemisphere is torpid whilst its fellow is wide awake? The curious cases of spontaneous somnambulism, in which persons so affected are said to possess "double consciousness" (a term, by the way, very objectionable), that is to say they forget entirely in one state all that has passed in a previous condition, give some countenance to this alternate condition of the two brains. Some

have suggested that we only use the two brains when we closely fix our attention on some subject before the mind. Have we the power of suspending the action of one brain whilst we are using its fellow? Such are a few of the speculations to which the duplicity of the brain has given rise.

Huschke, speaking of the corpus callosum, which unites the two hemispheres, says, the larger the commissure the more developed are generally the mental qualities of animals. Men with short or thin commissures are of limited understanding. If the commissure degenerates from disease they lose their memory, or may become idiotic. Treviranus considered the large commissure as the organ of memory, and others as the seat of the soul.

Neither Huschke nor the other authors give any reason for their opinions. Now, without considering the *corpus callosum* the particular seat of any mental faculty, we may fairly assume that upon its perfect integrity depends the combined action of the two hemispheres. Hence we can readily believe that individuals, in whom this commissure is largely developed, can bring the two brains into synergetic action; they can concentrate their thoughts upon any subject before the mind. This power is perhaps the most important element in the faculty of memory. Hence Treviranus was only wrong in calling the commissure the seat of memory, its action being seemingly mechanical. The power of fixing our attention begins to fail when one hemisphere, or may be the corpus callosum becomes impaired. But though we may admit that each hemisphere or brain is an independent organ of thought, it does not follow, as Dr. Wigan assumes, that the mind is dual, or that a separate mind resides in each brain. No doubt there are moments when we seemingly indulge in two different ways of thought, or are apparently impelled by two distinct volitions. This phenomenon is, however, explicable, by the rapidity with which both thoughts and volitions succeed each other, so that we imagine them to be synchronous.

*Unconscious Cerebration.* Every person, no matter whether or not he pays any attention to his mental process, must have made the observation that he sometimes meets in the street some individuals, who seem perfectly familiar to him, and yet he cannot for the life of him either recollect their names or the circumstances under which he met them. He taxes his memory in vain, until in despair he gives up the task. When lo! after some time all the circumstances appear of a sudden before his mind's eye, though his attention in the interval had apparently been engrossed with some other subject utterly

unconnected with that in question. This applies also to more complicated mental operations. Sir B. Brodie (*Psychological Inquiries*) alludes to this subject in the following terms:—"It has often happened to me to have been occupied by a particular subject of inquiry; to have accumulated a store of facts connected with it; but to have been unable to proceed farther. Then, after an interval of time, without any addition to my stock of knowledge, I have found the obscurity and confusion cleared away; the facts seemed to have settled themselves in the right places."

Dr. Carpenter (*Human Physiology*, 608-9), in treating of this phenomenon, observes:—"The entirely new development which the subject is frequently found to have undergone, when we return to it after a considerable interval, cannot be reasonably explained in any other mode than by attributing it to the immediate activity of the cerebrum, which has in this instance automatically evolved the results, without our consciousness. . . . It is difficult to find an appropriate name for this class of operation. They can scarcely be designated as reasoning processes, since 'unconscious reasoning' is a contradiction in terms. The designation '*unconscious cerebration*' is perhaps less objectionable than any other."

In the dialogue between Mephistopheles and Wagner (see Göthe's *Faust*) the inquisitive student is strongly advised "to stick to words." But, says the anxious scholar, "there must be a notion attached to the word." Meph. "To be sure there ought; but you must not be too nice about that; for just where our notions are wanting a word will help us out." Now, with all due deference to Dr. Carpenter, we must confess that "*unconscious cerebration*" seems to us an expression utterly devoid of any meaning. We apprehend that in a "cerebration" there must be something which "cerebrates," and something which is "cerebrated;" but, to use a popular expression, we are at a loss to conceive "which is which." But was there really any necessity for coining a new term for that mental process by which the automatic action of the brain, apparently without our knowledge, selects, aggregates, and eliminates facts and events? We think not. To be sure, the assumption of the automatism of the brain smacks somewhat of sensualism,—the modern name for materialism,—which broadly assumes that just as it is the function of the liver to secrete bile, and of the lachrymal gland to secrete tears, so it is the function of the brain to secrete thoughts. But whether we assume that the process is effected by the mind acting on and through the brain, or that the

latter acts automatically, the psychical phenomenon of a train of ideas being unconsciously evolved, once the impulse being given by a sensation or an idea, must be admitted as an ultimate fact, explain it as we may. These phenomena appear to us to pertain altogether to the law of association, which extends to all of our ideas, sensual, intellectual, emotional, and volitional. By association, under the laws of resemblance and contiguity in time and place, our ideas are regulated, linked together, and may be called up together. It has been said that it is to the mind what the law of attraction is to matter, drawing together ideas connected by affinities, and repelling others that cannot coalesce. The greatest confusion would prevail in our minds; our memory would be a lumber room, not a store house, were there not a fundamental principle at work which introduces some order among the myriads of our ideas. It is an automatic process not necessarily attended by consciousness. It is independent of our will; for though we have, in the waking state, considerable control over our association, we cannot altogether emancipate ourselves from its direction. Ideas which we would rather discard *will* start up, in spite of our efforts to suppress them.

And may we not, since it is permissible to theorize, in the absence of positive data, explain the spoken of psychical process in this way, viz., that whilst we use one hemisphere or one brain, in the elaboration of a fresh subject of thought, we leave the other brain to its own automatic action, that is to the association of ideas, in the evolution of which it will sometimes succeed more effectually when let alone than by the interference of the will, for it is frequently this very interference which defeats our object.

*The Cerebellum.* This organ is anatomically so distinct from the cerebrum, with which it is but slenderly connected at the base, that one would think that there could be no difficulty in assigning to it a special function; yet even here the theories are conflicting. There are comparatively few authors who have assigned to the little brain any participation in the higher psychical manifestations. Amongst modern physiologists we may mention Carus, who considers it as the seat of the will and desires; whilst Jessen deems it as the special organ of the emotions. Dugès (*Traité de Physiologie*) thought it was an organ of the perception of taste and hearing. Gall again, and his followers considered the cerebellum as the exclusive seat of sexual desire. Rolando looked upon the cerebellum as the central source of all voluntary motion. Magendie thought that this organ impels the animal forward, and thus was the antagonist of the *corpora*

*striata*, which induce the animal to retrograde. Flourens, Hertwig, and other experimentalists, only looked upon the cerebellum not as the source, but as the regulator of voluntary motions, inasmuch as animals deprived of this organ are still able to move, but cannot maintain their equilibrium. This theory of considering the cerebellum as the co-ordinator of voluntary movements, which had received the assent of most physiologists, is again contested by several eminent authors.

Brown-Séguard also denies that the guiding power has its seat in the cerebellum. "I have ascertained, he observes, that by the irritation they produce on various parts of the basis of the encephalon, that the diseases of the cerebellum or its extirpation in animals cause the disorder of movements, which has been considered as depending upon the absence of a guiding power. In fact the least irritation of several parts of the encephalon, with only the point of a needle, may generate very nearly the same disorder of movements that follows the extirpation of the cerebellum. I have been led to conclude that after this extirpation, or after the destruction by disease of a large or small part of this nervous centre, it is not its absence, but some irritative influence upon the parts of the encephalon that remain unaltered which causes the irregularity of movement."

"The cause of the co-ordination of muscular movements is" (says Schroeder van der Kolk) "situated in the spinal cord, and it has always been incomprehensible to me how any one could ever have referred it to the cerebellum. If the cause of co-ordination lay in the cerebellum no harmonized reflex movements could take place in a decapitated frog. . . . If the cerebellum were the seat of co-ordination, irregular movements would of necessity ensue, on an irritation of that organ. But in ulceration of the cerebellum, when the irritation is more chronic and not so violent, I have never seen irregular movements arise."

No wonder that the most recent writer on the physiology of the nervous system, Moritz Schiff, an experimentalist of considerable eminence, has arrived at the conclusion, that for the present, the real functions of the cerebellum are altogether *unknown*.

We have hitherto considered the hemispheres as the sole organ of the mind in man. Doubts have, however, long existed against the generally received opinion that the hemispheres properly so called constitute the only sensorium—the exclusive seat of consciousness. Modern experimenters have, therefore, endeavoured to establish the sensorial functions of certain ganglia in the centre and at the base of the brain; others in the medulla oblongata; and, finally, some in the spinal cord.

"I consider," says Lotze (*Medicinishe Psychologie*—Medical Psychology, 1852), "the corpora striata, the optic thalami, the tubercula quadrigemina, the pons, and the cells in their neighbourhood, as that series of organs in which the combination of sensual impression, and the excitation of co-ordinate motion take place, and that these parts may exclusively be considered as the 'organ of the soul.' To ascribe to each of these parts its proper functions we possess no exact data, except the blindness which seems to result from injury to the tubercula quadrigemina, and the disturbed co-ordination of motion, in consequence of the destruction of the optic thalami, and of some parts of the cerebellum. To consider so large an organ as the cerebellum the exclusive seat of sexual desire seems to me an absurd idea. I dissent, therefore, from all such fancies as to place intelligence in the cerebrum, the will in the cerebellum, and the emotions in the mesocephale."

Lotze further thinks that the hemispheres cannot be considered as exclusively the seat of intelligence, inasmuch as large quantities may be lost without interfering with psychical phenomena, and that there are instances on record in which the loss of cerebral substance has, after the cure, rendered the mental operations more active, and the temperament more lively than it was before the loss. He considers, therefore, the hemispheres, specially the cortical portion, as a nutrient organ for the nervous principle of the organs of sense. But though they have no direct influence upon sensation and recollection, the hemispheres may in one aspect be considered as an organ of intelligence, because they determine the force and functional capacity of the nerves, and possess thus a great influence upon the energy of sensation, emotion, and temperament. Dr. Carpenter, as is well known, has long advanced the same theory, giving to the above-mentioned structures the name '*sensory ganglia*', instead of *sensorium commune*.

*Thalami Optici.* From experiments performed to determine their functions, it seems that these bodies are not, as the name implies, essential to vision, for they have been destroyed without any loss of the power of sight. According to Longet the optic thalami seem to have a crossed action upon the voluntary movements. Destruction of the right thalamus has the effect that the animals fall at once upon the left side, and if the left be destroyed a similar debility is manifested in the right side. The removal of either of these thalami may also produce effects similar to those observed in the division of one crus cerebri, namely, a rotatory motion, the animal turning continually round. The real functions of these bodies are,

however, not satisfactorily proved; nor is this surprising, as they can neither be isolated nor entirely removed, without injuring the adjoining parts.

The terms *tuber annulare* and *pons varolii* are by many anatomists used synonymously; others apply the latter term only to the transverse fibres forming the commissure between the hemisphere of the cerebellum, and *tuber annulare* to the projection from the surface of the medulla, which contains a considerable quantity of vesicular matter; hence they consider this part as a special centre of sensation and motion. The experiments of Longet and Flourens show that even after complete removal of the encephalon above the medulla in warm-blooded animals, leaving the pons intact, there still remain indications of sensibility and voluntary motion, which cease on the destruction of the *tuber annulare*. The animal may still be induced to move by external irritation, but these movements seem rather due to reflex action of the spinal cord than to volition. The *tuber annulare* is, therefore, by some physiologists, considered as an organ by which impressions are conveyed inward, are converted into sensations, and where voluntary impulses originate, stimulating the muscles to contract.

*Tubercula Quadrigemina.* These are four round eminences, placed in pairs, two in front and two behind. The anterior pair, the nates, are longer than the posterior pair, the testes. Both pair are solid in the adult, and composed of white matter externally, and grey matter internally. That these bodies are closely connected with the sense of sight can be proved by direct experiment. Section at any point of the optic nerves to which they give origin, between the retina and the tubercles, produces complete blindness, whilst injury or destruction of the tubercles themselves produce the same effect. Besides being the nervous centres for the perception of light, a reflex action takes place through them to the iris, to regulate the quantity of light admitted to the eye, by the dilation or contraction of the iris. Dr. Laycock (*Mind and Brain*) dissents from this. "It is far more probable," he observes, "that the tubercula quadrigemina belong to the medulla, and may be considered to be co-ordinating structures for the substrata of the muscles of the special senses, including touch. In the mole, with rudimentary optic nerves, these tubercles are of immense size. This fact is of itself sufficient to disprove the theory as to the functions of these bodies."

*Corpora Olivaria.* Dugès (*Physiol. Compar.*, 1838,) observed:—"The olivary bodies possess another interest, as nervous centres. It

should be noted that the olivary bodies are more voluminous in man than in any other animal, and that the nerves of the pharynx, larynx, and the tongue issue from the olivary fasciculi, which by the mediation of the hypoglossus thus act on enunciation."

Van der Kolk says:—"Immediately after I had discovered the special fasciculus connecting the corpora olivaria with the nucleus of the hypoglossus I suspected that the very delicate combinations of motions in the human tongue, in articulation and speech, might afford an explanation of the much greater size of the olivary bodies, and of the more intimate connection with the nuclei of the hypoglossus. For speech and the articulation of words require such a multitude of varying combinations of its muscular movements, that it cannot appear strange that two auxiliary ganglia\* should be required for the performance of these functions." That the corpora olivaria are organs for the articulation of the voice is no mere conjecture, but confirmed by facts, several of which are cited by him.

From the intimate connection existing between the facial nerve and the olivary bodies, as shown by Retzius (*Müller's Archive*, 1836), the olivary bodies may also be considered as central organs for the mimic expressions in the countenance.

*Semicircular Canals.* The experiments performed by Flourens on these organs presented the following phenomena:—Section of the horizontal semicircular canal in a pigeon induced a tendency to turn to one side; section of a vertical canal was followed by a violent vertical movement of the head; section of the anterior vertical canal caused the animal to make continued forward "somersaults." Flourens hence concludes that the nerve supplying these canals does not minister to the sense of hearing, but to the direction of the movements of the animal.

In the sitting of the Académie des Sciences, Feb. 17, 1862, Flourens refers to this subject as follows:—"There are but four principal movements in man; from right to left, from left to right, backwards and forwards, each of which corresponds only to the direction of a semicircular canal; the movements from right to left, and from left to right—to the two horizontal canals, one right and the other left. The movement backward to the antero-posterior canal; the movement forward to the antero-anterior canal. These great phenomena, not yet explained, have engaged my attention for thirty years, and I trust I shall succeed in fathoming them."

\* The accessory olivary ganglia, discovered by Stilling, appear to be the centres for the process of deglutition.

These experiments, showing that there is a constant relation between the direction of each semicircular canal and the direction of the movement have been repeated by Brown-Séguard, and recently by Czermak; the former concludes that the auditory nerve is a veritable centre. Flourens does not say that the cause of the movement lies in the canals, but lies farther off in the encephalon.

*The Pineal Gland*, which has derived its name from resembling the cone of a pine, and has, from its central position in the brain, been considered by Descartes as the throne of the soul, has long lost caste, since it was found that the sand contained in it is not merely found in the brains of idiots but in the brain of every adult. Nor is the calcareous substance peculiar to the pineal body, but is found in other parts of the cerebrum, and from its resemblance to starch corpuscles, termed by German physiologists *corpora amylacea*. Indeed by some physiologists the pineal body is not considered to consist of nervous tissue at all, but is like the pituitary body, formerly believed to discharge its excretions through the nostrils, and thus to clear the brain, simply placed among the ductless glands. It is scarcely necessary to state that the functions of these bodies are altogether unknown.

*The Medulla Oblongata*. "Of all parts of the human body," says Schroeder van der Kolk\* (p. 87), "there is not one which is of so great moment to the existence and continuance of life, and to the maintenance of the most different and important functions of the system, uniting in a small space, and, as from a central point, directing so much that is various in aspect and really diverse as the medulla oblongata. . . . Here is, in fact, the nucleus and the central point, whence most phenomena proceed; *here the seat of perception or sensation seems to lie*; violent pain, by reflex action here, produces groaning; here reflex movements pass over to the other side; here is the centre of automatic respiratory functions and of deglutition; hence the nervus vagus derives its remarkable influence upon the heart; and finally, an irritated condition of this part produces excitation of the sexual organs, and even appears to have some influence on the action of the kidneys. That the medulla oblongata is the seat of perception can scarcely any longer be a subject of doubt. Not only is it known that the brain itself is insensible, but while the nerves of sensation in the spinal cord pass upwards, the trigeminus descends to the medulla oblongata, *that is, to the seat of perception.*" (Page 93.)

\* On the Minute Structure and Functions of the Spinal Cord and Medulla Oblongata. Translated by W. D. Moore. London: 1859.

But, strange to say, whilst Van der Kolk considers the medulla as *the seat of perception and sensation*, he invalidates his assumption in his remarks "on shrieking"—"There are, in fact, many involuntary actions, which we ordinarily regard as voluntary; for example, shrieking with pain. This shrieking appears to be merely the effect of a reflex action on the upper part of the spinal cord, or medulla oblongata. . . . Hence it follows that in vivisections so many incorrect inferences are drawn as to feeling or perception in animals. If the brain is cut off above the pons varolii, and the fifth pair of nerves be strongly stimulated, the animal will cry out, *although without consciousness, without perception, and without feeling of pain.*" (Page 77.)

Here we may well ask, if the medulla, and not the brain, is the seat of sensation, how does it come to pass that the removal of the hemispheres abrogates sensation, though the medulla remains intact? The above fact would rather lead to the inference that the seat of perception is in the hemispheres, and not in the medulla. We simply draw attention to this glaring contradiction, without in any way denying that the medulla may be a centre of sensation and motion, specially in animals possessing no brain, properly so called. But not merely the medulla oblongata, but the spinal cord, properly so called, has been considered as a real sensorium.

*Sensorial Functions of the Spinal Cord.* Many observations have abundantly proved that animals may feel and will after the removal of the hemispheres. It is also remarkable that this removal does not produce the same effect in all animals. Thus, rabbits and guinea pigs were seen to run about after the operation, and the latter are even said to defend themselves, when irritated.

The clearest proofs of sensation and volition are, however, exhibited by reptiles. "Twenty-four hours," says Volkmann (*Wagner's Handwörterbuch*, i., 579), "after I had removed the large hemispheres from a frog it skipped about in the room, endeavouring to conceal itself behind a chest of drawers, and though pushed back several times with the hand or foot, it always returned. Placed into a pot it did not spring forward, but upwards, as if it saw the aperture. Motions of this kind cannot be called reflex, for such actions an excitation is requisite, which primarily proceeds from the periphery to the centre, and secondarily from the centre to the periphery."

A large alligator, four feet long, being decapitated, the headless trunk, as on many former occasions, performed numerous actions, indicative of volition, sensation, and intelligence. The body curved

in a manner so as to recede from the offending agent, and the limbs were directed so as to remove it. From its actions, far more impressive than words, it was evident that it judged accurately, as to the degree, duration, and place of painful or painless impressions. (*Dr. Dowler on Nervous Action.*)

E. Pflueger\* has published a very interesting monograph "on the sensorial functions of the spinal cord," not only in reptiles but in mammals, and also in man. This theory has only received a partial assent from physiologists.

*The Vital Knot (point vital, nœud vital).* There is a small V-shaped spot of grey substance in the medulla oblongata, resulting from its bifurcation, which is by Flourens pointed out as the centre of life, because instant death is the consequence of its destruction.

Dr. Brown-Séquard, however, considered that Flourens has erred, in ascribing this function to this part, inasmuch as the removal of the "nœud vital" does not immediately produce death, nor is voluntary motion and sensation instantly destroyed.

Flourens replies:—"Physiologists have asked me to indicate the precise spot of the 'point vital.'" I answered, "the point vital" is indicated by the V-shaped gray substance. They asked me for an external mark, and I gave it. But I never imagined they would take the external mark for the spot itself. It seems, however, that some have committed this mistake; they removed the V-shaped grey substance, and were astonished that the animal did not die. The V-shaped substance has nothing to do with the "nœud vital," which is situated beneath it. The "nœud vital" is double, as every thing is double in the nervous centres. In order that life should cease, both halves should be divided to an extent of two millimetres and a half each, five millimetres for the two. A transversal section, deep enough, of five millimetres at this given spot, is sufficient to destroy life at once.

From the conflicting opinions entertained by physiologists, in regard to the function of most parts of the encephalon, it cannot but be admitted, that despite of numerous experiments, cerebral physiology is still in its infancy. The most essential requisite is, no doubt, in the first place, a microscopic anatomy of the brain, which is far from being complete; so that Gratiolet, one of the most eminent

\* Die Sensorischen Functionen des Rückenmarks. Berlin: 1853. See also G. H. Lewes' Physiology of Common Life, and papers read before the British Association 1858, for the details of a theory generally in accordance with that of Pflüger.

cephalotomists of the day, says—"Let us confess that in our ignorance of the true structure of the medulla, the peduncles, and the optic thalami, the question is abandoned to the speculations of physiologists." How long it may be before cerebral physiology shall acquire a firm basis, and reach that state of perfection which may enable us to solve any of the mooted problems, we cannot at present say. In the mean time, we must continue searching for corporeal parallels to psychical manifestations, and collect all possible information relative to cerebral structure, both of individuals and of the different races of mankind.

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## SEEMANN ON THE INHABITANTS OF THE FIJI ISLANDS.

By A. A. FRASER, Esq., F.A.S.L.

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It is somewhat singular that so long an interval should have occurred between the revelation of the wonders of the Pacific by Captain Cook—its practical discovery in fact—and the occupation, for colonization or commerce, of certain islands and groups of islands, which he proved to contain all those elements which can be welded into wealth and prosperity. It is true that the famous Botany Bay was examined a few years after the great navigator had visited it,—the spot of his landing being marked by a plate and inscription,—but more than half a century from that date passed before the first emigrant ship ran into Queen Charlotte's Sound, New Zealand, with a number of settlers to occupy a country with which Captain Cook was delighted, and which both the Americans and the French thought of colonizing before us.

The aborigines of Australia having familiarized Europeans with their manners and customs, the white rovers soon faced the feared and long-dreaded New Zealander, or Maori, and anchored in his harbours, fished on his coasts, ascended his rivers, and soon boldly ventured on more intimate relations. It was bold spirits who colonized Australia, and the boldest of them who settled amid the can-

nibals of Cook's Straits, and gave the Maori that taste for trade which was the germ of civilization.

Fiji, lying a week's sail to the north of New Zealand, was far less likely to be occupied quickly by Europeans than the latter group. It did not lie on the route of large fleets, its inhabitants were shunned as the most truculent of savage tribes, and its encircling reefs were the dread of the mariner. But, as the whale fishery drew whole fleets of ships to uncolonized New Zealand, so the Bêche-de-Mer and Sandalwood trade attracted American traders to savage Fiji. In both cases, turbulent seamen from among the traders formed the nucleus of European occupation. The early authentic history of the group is closely connected with the career of one Charles Savage, who was wrecked on one of the islands, and who became quite a powerful chief. It will give some idea of the manner in which a slain enemy was and has been treated by the Fijian, when Wilkes and others state that Savage was killed in a fight, eaten, his bones made into sail-needles, and his skull into a drinking cup.

The group of islands called Fiji, extending over five degrees of longitude and three of latitude, contains over two hundred islands, two of which—Na Viti Levu and Vanua Levu—are, the former ninety, and the latter one hundred and fifteen miles long.\* Fiji, from its size, position, and products, has lately occupied a prominent position before the public; and it would appear that our government a short time since were anxious to have it critically examined by competent authorities, with a view to understand its usefulness and value as a colony.

A party was arranged accordingly to examine the group. The result of the visit has been the interesting and reliable work before us, *A Mission to Viti*, by Dr. Seemann, who, in the character of botanist and traveller, has certainly made the most of his time; visiting out-islands, exploring new districts, ascending mountains till then untrodden by Europeans, and discovering entire orders of plants, not a member of which was previously known to the scientific world. All this was done too with the keen relish of an enthusiastic admirer of Nature, and hence the book carries with it an air of freshness and vigour.

We are glad to observe, that, at the outset Dr. Seemann was convinced of the necessity of adhering closely to the authorized form of the Fijian language, he says, "Nothing but endless confusion will be the result if every nation is allowed to write Fijian names according

\* Feegeean and English Dictionary, Vicnu, by the Rev. D. Hazlewood.

to its own orthography." Exactly so. And if travellers will be careful to observe the same course they will save themselves much trouble, and get the blessing of those who follow them. For example, "Mudwater" is found to be Macuata, and series of names are recognized after great difficulty only, and all this might be obviated, if travellers would, with Dr. Seemann, get an insight into the character of the language, names from which are to be published to the world. After some puzzling, it was found out that the non-descript name which appears in most maps for the North Island of New Zealand, Eaheinomauwe—as handed down by voyagers—should have been Te-ika-a-Maui.

Many a scrutinizing glance has been cast over Na Viti Levu (big Fiji), and many a bold spirit has longed to explore its rivers, and distant mountains, as voyagers have anchored on its coasts for refreshment or trade. And the curiosity of the traveller has been heightened by the fact, that the only knowledge the tribes on the coast have of the interior is wild rumour. Even at the present date, this large island is for the most part entirely unknown to us; our discoveries being limited to portions of the south-eastern coast, and especially the district of the Wai Levu, or Rewa River.

Up this river went Dr. Seemann, determined to explore as much of the country as possible, his party consisting of Col. Smythe, Mr. Prichard, the Rev. J. Waterhouse, Danford, Chief Kuruduadua, and a host of followers, all embarked in canoes. Away they dash in high spirits, and now Dr. Seemann begins to take advantage of his enviable position as a traveller with a vast field of observation before him. "I thought I could not do better," said he (p. 148), "than take advantage of their local knowledge, and dot down all I heard, saw, and had pointed out." And if these dottings have not the sensational adventures of those travellers who think they ought to be shot, or drowned, or something worse at regular intervals to make their travels worth reading, they have the greater merit of being the careful and critical observations of an old traveller and man of science "upon the wing," as Dr. Burton observes.

Towns, plantations, and varied scenery delighted the eye, as the light canoes with their strange-looking outriggers dash up the river. But then they approach the "hundred waterfalls," and the river becomes a net-work of dashing, foaming rapids. The canoe was dashed away and capsized, and the tea and sugar came to grief, the biscuits becoming a pulpy mass like "bread-and-butter pudding."

The travellers reach the town of Nagadi, and we get a good insight

into the manners and customs of the "Kai Viti." A supper of pork, yams, and taro, was cooked in the native fashion, "all baked on hot stones in true Polynesian style, as Captain Cook described it one hundred years ago." After supper came the grog, in other words, "yaqona" (yanggona), the brewing of which would not probably suit English tastes any more than the liquor itself. Those who may be curious to see the apparatus for brewing kava—as it is commonly called in the Pacific—will find the *et ceteras*, with many other articles worthy of attention brought home by Dr. Seemann, in the museums in Kew Gardens.

One fact is recorded which is worthy of attention, as it explains the reason why Europeans often live amongst the worst savages in perfect safety—a thing not often understood. Dr. Seemann says, that Colonel Smythe discovered one day he had left his purse at the last halting place. "Make yourself perfectly easy about it," said Kuruduadua, when this loss was communicated to him, "I allow no thieving here; I club all thieves; they don't do that at Rewa or Bau." Of course the purse was safe, and would have been safe anywhere, as being the property of a man *under the protection of the chief*. So with individuals as with property; and the exploring party were perfectly safe while under the ægis of this chief, although in a district where human life was little valued, and the natives were confirmed cannibals.

The ethnology of the Fijian branch of the human race is a subject full of interest, of great importance, and, as regards purely scientific and accurate knowledge, but little understood. Various missionaries and members of scientific expeditions have written much upon the manners, customs, and traditions of the Fijians, but they have had no system of anthropological research, by which to guide their researches to a conclusive issue. They have gathered isolated facts, but there has been no centre around which to group them; and, for the present, they are comparatively useless to the ethnologist. Let us take the views of Dr. Prichard\* upon this point. After a very short discussion, he insists that "the Polynesian nations, though belonging to a different physical type, are, nevertheless, genuine descendants, or really cognate tribes of the Malayan family." And this, upon all but circumstantial evidence—easy communication from island to island, slight affinity between the Malayan and Fijian languages, etc. But who has attempted to prove this from evidence such as the islands themselves might offer? We

\* Natural History of Man, vol. ii, p. 436.

do not wish to impugn a sensible hypothesis, but we would rather have a proved fact, as a basis of argument, than an hypothesis.

Dr. Prichard—to show how he arrives at conclusions—quotes Crozet, dividing the New Zealanders into white, brown, and black people; and adds, “the latter are of smaller stature than the former, but there is no clear indication of their belonging, as some have conjectured, to a different stock.” Was the latter assertion founded on such ascertained facts as scientific men like to use? Decidedly not. The Rev. T. Taylor, for many years Church missionary at Cook’s Straits, a philologist and naturalist of considerable experience, distinctly states,\* after long observation, that the Maories “are decidedly a mixed race.” And the natives themselves have traditions of a strange race, included in their mythology, which may, for aught we know, *with certainty*, refer either to some found in the island of New Zealand, when they emigrated thither, or to others of a different race, who have arrived since, and have become fused into the Maori family. The actual fact is generally denied; but who has proved, upon irrefragable evidence, that the Maoris have a common origin, and that they found the large fertile islands of New Zealand uninhabited, when they reached them from the North? No one.

After quoting evidence referring to the Tonguese, viz., “the natural colour, I believe, almost without exception, is black; but some stain it brown, purple, or of an orange cast”; which is totally incorrect, Dr. Prichard (vol. ii., p. 477) agrees with M. Lesson, “that the Polynesian race had peopled the distant groups in the great Pacific before the progress of the Pelagian negroes, in a similar direction, took place;” and yet, we contend, that the light Polynesian race are the conquerors in the Pacific. But after making general conclusions upon the races of the Pacific, he says, very naïvely, “we have not yet sufficient information respecting the Viti islanders to afford any conclusive evidence on this subject.” Dr. Seemann’s observations on the people are pertinent and correct; and from what crops out, here and there, we believe had not his labours been specially directed to the “flora” of Fiji, as the botanist of the mission, we should have had a mass of ethnological evidence derived from observation, founded on fact, and arranged and pushed to legitimate conclusions on vexed points.

We do not remember seeing any where else so clear and phi-

\* See *Te ika-a-Maui*, p. 184; also his belief of Chinese or Japanese having settled here, and of a Chinese bell found at Wangarei in 1839.

† See Dr. Seemann’s evidence, *Viti*, p. 236.

losophical an argnment upon the nature of cannibalism—upon which so much misapprehension exists—as the following (p. 181): “Fijians always regarded eating a man as the very acme of revenge, and to this day the greatest insult one can offer is to say to a person ‘I will eat you.’ In any transaction where the national honour had to be avenged, it was incumbent upon the king and principal chiefs—in fact, a duty they owed to their exalted station—to avenge the insult offered to the country by eating the perpetrators of it. *I am convinced, however, that there was a religious, as well as a political aspect of this custom, which awaits future investigation. . . . .* There is a certain degree of religious awe associated with cannibalism where a national institution, a mysterious hallow akin to a sacrifice to a supreme being, with which only the select few, the tabu class, the priests, chiefs, and higher orders, were deemed fit to be connected.”

We must here insist upon the fact that cannibalism has been, and still is, to a less extent, not only a custom, but an *institution*, entering deeply into, or rather having been formed out of the several elements of Fijian character, and moulded into a semi-religious, semi-social instrument, whereby:—

1. Reparation was to be afforded, for insult, injury, etc.
2. The gods were to be propitiated, as by a kind of sacrifice.
3. The most complete revenge could be obtained, doing justice to the wronged, and giving pleasure to the gods as well.

The perusal of this book alone will satisfy all, as to the prevalence of the *institution*. The drum beats,—that horrid wooden drum,—and the natives rush out to see the victim. “He\* is stripped naked, struck down with the club, his body ignominiously dashed against a stone, *in front of a temple*, and then the body is cut up, and *divided amongst a chosen few*, ere the vital spark is extinct. Sometimes he is dashed into an oven, whilst yet alive, and half frizzled. The little children run off with the head, and play with it, as you would with a cricket ball.”

A mass of evidence could easily be furnished, to prove that cannibalism in Fiji was not only an institution, but one, sad to say, extensive in its operations. One instance; in 1841, Ratu Varani, a chief of power, in Viwa—who, with his own hand clubbed the captain of “*l’Aimable Joséphine*,” a French brig, and took the vessel—led one hundred and forty Macoëans into an ambush, and “in† the

\* “*Vah-ta-ah*,” p. 30, Introduction. By Rev. J. Waterhouse.

† *L’Univers Pittoresque*. Paris: 1837.

‡ Notes in the Memoir of the Rev. W. Cross, p. 199, et seq.

space of a few minutes about one hundred of them were massacred. A few were shot, others were cut to pieces with hatchets; others had their brains dashed out with the fearful clubs of 'these horrible dogs of war.' Only a few of the number were saved, and *the rest were taken to Bau, cooked, and eaten.*"

Some writers, betrayed by appearances, have imagined that scarcity of food was the real cause of anthropophagism in the Pacific; but the ground of this argument is taken away as regards Fiji, when we consider that, notwithstanding the islands do not produce but a fraction of what they might, yet enormous feasts are of constant occurrence; and furnishing fresh provisions to whalers and others has long been a source of profitable barter, and this often on a large scale.

As a matter of course, there would be many among the rude savages of the Pacific in whom the horrid practice of eating their victims ended in a morbid relish for such food; and out of much information on the point, we are willing to rely upon the authority of Dr. Seemann, as given at p. 174, et seq. The views of the French navigator, Dumont D'Urville, resting upon evidence gained on the spot, are so pertinent to this subject that we cannot forbear quoting them:—"Ceci démontre que les préjugés superstitieux, et les plaisirs de la vengeance, dirigent ces sauvages dans leurs festins barbares bien plus encore que les simples besoins de l'appétit physique. A cet égard, nous partageons complètement les idées de Forster, Savage, Nicholas, Marsden, Kendall, etc."\*

Dr. Seemann touches upon the question of the spread of the light coloured race over the Pacific, and its subjugation of the black (p. 236, et seq.); and we have a few judicious remarks, which are worthy of the attention of ethno-anthropologists. He says, "Ethnologists have long been watching the spread of the Tonguese over the South Sea, and Viti has become a field of high interest, as the light-coloured Tonguese, a genuine Polynesian people, have here met face to face powerful representatives of the dark-coloured Papuan race." And, speaking of the two races—Tongans and Fijians—observes, "the Tonguese, or Friendly Islanders, may well be called the flower of the Polynesian race. . . . They are tall men, with fine intelligent features, dark, often curly, hair, and of a light-brown complexion." It is also stated, "they are far beyond the Fijians, in good looks." Commander Wilkes' evidence is similar; and he adds, "it was pleasant to look upon the Tonguese, but I felt more

\* Voyage de l'Astrolabe. Paris: 1830. Tom. ii, p. 547.

interest in the Fijis." Using the word race to mean such a branch of the great human family, as is readily distinguishable, by marked peculiarities of physical structure and language, it would appear that the dark men of the Pacific—to whom the Fijians belong—are inimical to the light race, and that the latter, being more powerful and warlike, tend towards the subjugation of the former. Here, again, there seem to be several points of the deepest interest, which, not being settled by rational deduction from ascertained facts, leave the question of race, its limits, variations, etc., in great confusion. Admitting, with Dr. Prichard and M. Lesson, that the Malay race spread from west to east, and that the distant groups in the great Pacific had been peopled "before the progress of the Pelagian negroes, in a similar direction"—in other words, that the light-coloured race spread somehow over the Pacific, and were succeeded by the dark Malays—we are forced to inquire, whence came the light Polynesians? They are commonly spoken of as springing from the Samoan group, and they might have arrived there from the clouds, for what evidence we have gained to the contrary; in fact we believe it would suit the arguments of some to give them such an origin, because it simplifies matters to tell us that the inferior race spread over the Pacific till they were met by the superior celestials, who were and are bound "westward ho!" If the two races of population set in the same direction, how could the weak supplant the strong? and the conquered race, by some sudden, unexplained cause, turn conquerors? And yet Dr. Prichard is vexed with Mr. Crawford, for not accepting his conclusions.\* Space will not permit us to go deeply into the question, but, if we have started questions which are commonly supposed to have been clearly answered, it is because, from personal experience, we are surprised at the grand theories built upon such slight evidence, and astonished, that while our scientific expeditions are despatched to investigate the botany and zoology of distant and little-known regions, by attentive observation and research on the spot, the most superficial attention is given to those points relating to anthropology, upon which, we think, more depends than upon philological notes, and second-hand information. The Novara expedition is an exception to this rule to some extent.

Dr. Seemann, "more than half a tree worshiper," is at home among the products of the Fiji group, and we have his authority as to some of the vegetable wonders of these islands. Here are palms, useful and ornamental; fruits in profusion; shaddocks, guayava, custard-apples,

\* Natural History of Man, vol. ii, p. 428.

plantains, and bananas, weighing from 50 to 80lbs. a bunch; and as to yams, "specimens eight feet long, and weighing 100lbs., are by no means rare in the group." The islands contain also fine timber, some of the Dammara pines rivalling those of New Zealand, in size. Here also are the iron wood and paper mulberry trees; the former being handy for clubs, etc., and the bark of the latter to make the native clothing. Passing these, and numerous others, we must notice that trade is carried on in arrowroot, tortoise-shell, oil, provisions, and articles of native fabrication. As regards the growth of cotton, which is just now a matter of importance, Dr. Seemann states, "if I understand the nature and requirements of cotton aright, the Fijis seem to be as if made for it . . . . in fine, every condition required to favour the growth of this important production seems to be provided." Surely this will be a cotton-growing group, and if not so serviceable to England, will feed the Manchesters of Australia. And we shall be surprised if the general, as well as the scientific reader, does not find himself interested in the rich and beautiful Flora of Fiji, as described in so pleasing a style.

All those who have had the opportunity of visiting a large Chinese city, or seaport, have noticed baskets of black-looking substances, like pieces of charred leather—and something similar is trepang, or bêche-de-mer, of which the celestials make "a very rich and palatable soup and dress it in different kinds of stews." This\* bêche-de-mer—an echinoderm—is found in large quantities upon the reefs in Fiji, and Dr. Seemann gives us a notice of the character of the trade, and to what an extent the people depended upon it for barter. The Americans seem to have monopolized the trade, and, as "a whole cargo which cost 1200 dollars" has been sold for 12,000 dollars, they make fortunes occasionally by it. In the historical remarks, at p. 405, *et seq.*, we have some interesting particulars respecting the early traders in this "sea-slug" and sandalwood—the former referring to the tastes, the latter to the superstitious worship of the Chinese. It was by means of these traders that Europeans were led to visit these islands, and open up an intercourse which is now ripening into friendly association for the purposes of commerce.

We are glad that Dr. Seemann's book is not encumbered by a heterogeneous massing of so-called manners and customs, but that observation for the most part takes the place of hearsay oddities. Besides, so much has been done in this direction, that we must begin

\* Specimens of various kinds of trepang may be seen in the Chinese division of the Food Collection at the Kensington Museum.

*de novo*, and, clearing away much of the rubbish, systematize the really good evidence which remains. This has been done to a great extent in Chapter xix, more especially relating to the Fijian religion. Here we find the usual feeling of connection in some way with the departed—a belief in the creation, flood, and destruction of the world—of a kind of heaven which is rather difficult to reach—of a punishment for cowards, etc. Their priests are certainly odd characters, and evidently make good use of their friendly relations with the gods, the offerings to which they *carefully look after*.

Not only may parallels be found between Old-World and Fijian customs, but, to carry comparisons further, the Fijian language does, in Dr. Seemann's estimation, vie with our soft Spanish or Italian in euphony. We should bear in mind that the Slavonic languages look alarming when written, but are far different spoken. The Fijian, like the Greek language, has its three numbers—which one would hardly imagine—and in reading the names, *b* is sounded *mb*, *d-nd*, *g-ng*, *g-ngg*, and *c* like *th* soft. Repetition is in great use colloquially, and some of the ordinary compound words are scarcely shorter than formidable German composites, for instance, an "*ill-tempered man*," would be a "*tamata dauvakacudrucudruya*."

And now the question arises, what will become of Fiji? Its value is before the world. Who will occupy it? England refuses the offer of Cakobau the king; will the French do so? However, Dr. Seemann's critical observations enable him to say, "I have no doubt as to the future of Fiji." Nor have we. "The importance of the group once recognized, nothing will stop our race from taking possession of it, and replacing barbarism and strife by civilization and peaceful industry." It appears that colonization is rapidly taking place. Land is being purchased by our countrymen, trade is spreading, and as a consequence of this, vessels are carrying the means and the instruments of civilization to the group, and collecting the fruits of this new West Indies for the Australian and other markets. Another point of interest attaching to this group is—as will be seen on reference to the appendix—that in the event of mail communication between Panama and Sydney, the island of Kandavu would be a good central position for a coaling station and general depôt for the Pacific. Besides, as the French are masters of Tahiti and New Caledonia—naval and military stations in the Pacific—our shipping would be entirely exposed on this great ocean without a place of refuge or defence.

*Au reste*, some books of travel are written to sell, and hence they refer to the imagination only; but this is a book evidently intended

to instruct, and to speak throughout to the mind of the reader. And if important topics are not treated so fully as might be, and information in some respects is scanty, we must remember this collection of facts, notes of travel, and general observations, was made by the author while busily and devotedly engaged in a particular duty. Throughout, we perceive the experienced traveller, the practical philosopher, and the man of science, and our great regret is, that Dr. Seemann had not the opportunity and means of devoting himself to the critical examination of the ethnology and ethnography of the Fijian Islanders as he has of the botany of their islands. However, amid a good deal of confused information on these islands, it is refreshing to read a book like this, and feel, that its facts are reliable, its observations forcible, and its arguments to the point—that it is, in fact, a good authority on these islands, and one which the general and the scientific reader will peruse with both satisfaction and profit.

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## THE RELATION OF MAN TO THE INFERIOR FORMS OF ANIMAL LIFE.

BY CHARLES S. WAKE, Esq., F.A.S.L.

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IMPORTANT as is the question of the relation between man and the lower animals, there can be no doubt that all inquiries as to the real nature of that relation have hitherto failed. Both materialists and spiritualists have been alike at fault. Neither of them has got beyond the mere external points of resemblance, the one of the body, the other of the mind; whereas the true question is, not in what do man and the lower animals agree, but in what do they differ so as to cause man's great superiority? The reason why the metaphysicians have thus failed is that, shackled as they have been by the prejudices of a too jealous theology, they have so framed the fundamental idea of their science, that the application of its truths to the subject of man's relation to the lower animals could not have any satisfactory result. On the other hand, the materialists, although their facts are abundant, have failed, because they have sought to deduce their theories from mere physical data, almost ignoring the influence of the spiritual powers in the phenomena of animal being and action. They have

been content to refer man's superiority to his possession of a greater capacity and finer texture of brain, combined with that of a refined organ of touch, forgetting that such superiority, with the higher nervous structure itself, may both be due merely to the operation of spiritual causes. Although Professor Huxley is by no means of this latter opinion, yet he may be quoted as an authority against any theory founded on mere structural differences between man and the lower animals; for he says "no absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves." Whether his explanation of man's superiority is sufficient will be shortly seen.

Before endeavouring to ascertain by the application of the principles of psychology, the relation of man to the lower animals, it will be necessary to examine rather more fully the question of man's higher nervous structure. Of course it is impossible to *demonstrate* what influence over mental development the brain may have, or what ratio the development of the one bears to that of the other. It is quite evident, however, that the brain proper is not really essential to the exercise of mental power. If we take the invertebrata, creatures that have no brain, but merely one or more small nervous ganglia in its place, we see the exercise of great mental activity, and of a process of reasoning, simple though it may be in its nature. Comparing the actions of the invertebrata with those of the vertebrata, although we observe a marked advance in reasoning power, yet the increase is by no means proportioned to that of the nervous development as seen in the vertebrate brain. Judging from that fact, and from the small difference comparatively in the development of their respective brains, we should expect to see in man but little advance in mental development over the higher mammalia. It is not so, however. The superiority of man over the highest of the mammalia is far greater than that of any of the latter over the invertebrata. Nor is it merely an increase of intelligence. It is rather an enlargement of the mental powers, leading to the accumulation of stores of knowledge utterly unattainable by brute creatures, proving in man a mental development in some sense differing in kind as well as in degree.

Nor does the addition of a refined sense of touch account for man's superiority. As Sir Charles Bell has well said, "the hand corresponds to the superior mental capacities with which man is endowed. The instrument is capable of executing whatever his ingenuity suggests. Nevertheless, the possession of the ready implement is not the cause

of man's superiority, nor is its aptness for execution the measure of his attainments. So we rather say with Galen, that man has a hand, because he is the wisest of creatures, than ascribe to his possession of a hand his superiority of knowledge." It may be added that the argument just drawn from a comparison of the development of the brain in different animals, with the amount of intelligence seen in their actions, may be equally drawn from a comparison of that intelligence with the development of the organ of touch. Superior as is the human hand over that of the ape, that superiority is by no means equal to man's intellectual superiority over the most intelligent of the lower animals. As an instrument of communication with the outer world, and as a means of obtaining a true knowledge of form, size, and distance, man is perhaps as much indebted to the hand as to the eye; but without the mental faculty of combining their various sensations, the human hand would have no superiority in result over that of the ape.

Equally weak is the reasoning which ascribes brute inferiority to the want of the power of speech. True it is that language is the great instrument of man's progress in knowledge, but it is no less true that man's possession of the gift of speech can only be accounted for by the supposition that he is of a superior spiritual nature, language itself being the chief outward sign of such superiority. The lower animals themselves not only use certain sounds by which to express certain emotions, but they are able also to communicate their ideas to each other. In those sounds we have the rudiments of the speech of man, and they are as perfect for the use for which they are designed as are the operations of the mental powers which interpret them. The peculiar structure of the human organs of speech as little explains man's possession of a language, as does his superior brain development the greater development of his intellectual powers. Those organs are no doubt especially fitted in man for articulation, but many animals can produce sounds as articulate as those of man; and some birds can even speak with remarkable clearness and volubility. This shows convincingly that "the main difference lies in the internal faculty or propensity. . . . The perfect correspondence between the vocal instrument, and the laws governing the motions of the air is a contrivance, but that which prompts the first efforts at articulation is in our intellectual nature."

In endeavouring to ascertain the true nature of the relationship between man and the lower animals, it will be necessary to treat of that relationship as of a twofold nature—that of the body, and that

of the soul, or whatever that principle may be in which reside the mental and emotional powers—as though the development of the powers of the soul is dependent, in the first place at least, on the body, they in reality exist independent of it. To show the analogy between the physical constitution of man and that of the lower animals, it will be sufficient to confine our attention to the development of the nervous system, as seen in the several organs of sense, that system being the portion of the bodily organism through which the inner principle of being holds intercourse with the outer world.

Considered as a nervous animal, man is seen to be allied to the lowest animated forms beneath him. The human being has five organs of special sense, but when we examine their operation we find that, however different may be the sensations transmitted by each, they may all be reduced to one single sense, that of touch or feeling. Smell and taste are dependent on touch, equally with seeing and hearing. In each case the impression is received by a sensitive surface, which is affected by contact with the operating medium, the difference between the sensations transmitted being caused by the structure of the organs themselves, rather than by any peculiarity in their operation. If we survey the animal kingdom we see the several organs of sense gradually losing their high and special development, until, when we reach the lowest form of animal life, no special organ of sense can be detected, and it is doubted even whether any nervous structure exists. Even, however, in the actions of the protozoa,—animals without the slightest trace of any bodily organisation,—we observe the operation of something like sensation, revealing the presence of a general sense of touch. This is the very simplest form of nervous development (if that term may be applied to it), and of course it is not pretended that there is any knowledge on the part of the protozoa of the sensation. It is wholly instinctive, and that because the operation is not of a special organ of sense, but merely that of the general nervous sensitiveness which underlies all the special media of sensation.

It is not until a nervous system can be distinctly traced that we find the development of a special organ of sense. When it shows itself, however, it is seen to be one of those that man also possesses. And it is important to our argument to observe that the sensational organs of the lower animals, when they *are* developed, are always essentially the same as those of man. He has in their perfection all the organs of sense possessed by any of the creatures below him. Passing through the radiata, the mollusca, and the articulata, we

reach the vertebrata, in which the organs of sense are more perfectly developed than in any other of the lower animals. Among the vertebrata we may accept the ape as the nearest approach to man in bodily structure, and we find that the special nervous developments are the same in both, the only apparent difference being in the superior fineness of the organ of touch in man, he being the only animal that possesses such an organ in the form of a true and distinct hand, used only as an organ of touch. That fact is significant, as showing the special development of the general underlying nervous sensitiveness, and, as such, being the most important of all the special nervous developments.

The organs of sense being thus alike in man and in the lower animals, the sensations which are the result of the operation of those organs, must also have a resemblance. Light affects the eye of the eagle in the same way as it affects that of man, and the same sensation will in each case be impressed on the brain. And not only so, but that sensation will be interpreted in the same way in both cases. The object from which the light which gives rise to that sensation is transmitted will have the same appearance to each. Nor can we doubt its being so, when we watch brute actions, and compare them with those of man under like circumstances.

We have now reached the second point of relation between man and the lower animals, and we are met on the threshold of inquiry by the important question—to the operation of what principle are the actions of the lower animals to be referred? Are they phenomena accompanying a peculiar state or development of a material organisation merely; or must they be ascribed to the operation of a spiritual principle, independent for its being of material organisation? We, perhaps, know too little of the true nature of matter to judge whether in its ultimate essence it may not be capable of thought or will. The intimate union between the body and soul of man points to a very near approach, if not in essence, at least in mode of being, of matter to mind. Until, however, we know more of the nature of the material essence, we are justified in asserting that matter cannot think or will.

The actions of many of the lower animals so closely resemble those of man, in their motives and object, that it is usual, as we have seen, to refer brute inferiority to the restricted development of the mental powers, consequent on some difference in nervous structure, or on the want of the power of speech, without supposing any actual inferiority of mental nature. None can doubt that brute

action is very often governed by observation, and by reasoning on the result of such observation. If that be so, it proves the exercise of the mental process (call it thought or intuition), from which judgment flows, and of the will which gives effect to the determinations of the reason. Nor can we deny to the lower animals the attributes of bodily sensibility and mental emotion. This sameness between the spiritual powers of man and the lower animals must be remembered. For if the actions and emotions of the latter are merely the result of the activity of the forces of a material organism, so must those of the former be also. Superior as the result of the operation of the mental powers may be in the case of man, if those powers operate alike in both, they must inhere in the same principle, spiritual or material. If, however, brute action is not the mere result of bodily organisation it must depend on the activity of a spiritual principle; and it is asked what is that principle? If we examine man's internal or mental actions we see that they may be classified as those of emotion, thought, and will, none of which we ever think of referring to the body alone. It is the spiritual principle of being we call the soul, the very man himself, which thinks, and which shows the result of its thought in the physical actions that flow from the determination of the will. If it be so, can we deny to the lower animals the possession of the soul? Even if the exercise of thought could be imagined to be the operation of a cunningly devised material mechanism, no mere machine could give the light which sparkles in the eye of the affectionate dog, or prompt the care of the sagacious elephant.

If the lower animals have a certain spiritual principle, which we call the soul, as part of their being, man, as a being of like emotions, thought, and mental action, must have the same spiritual principle, the possession of which is the second point of relation between them. It will perhaps be objected, that man may have a principle of being which acts in the same way as that possessed by the lower animals without its being the same in essence—that indeed the brutes have what has been called the animal soul which dies with the body, but that man has a spirit possessing all the powers of the soul in a superior degree, and in a fuller development, and which is immortal.

It is not for us to say that there *cannot* be two distinct kinds of spiritual essence which, though different, have yet the same powers and attributes, the only distinction between them being that those powers are more fully developed in the one than in the other. It does, however, seem to be improbable. The soul is made up of cer-

tain powers or attributes which alone give it existence, and the operation of which is alone the sign of spiritual life. Wherever, then, those powers exist, there also is the soul as the principle of being in which they inhere, and any inferiority of soul action in any particular case must depend, not on actual inferiority of spiritual nature, but either on some inferiority of bodily structure which hinders the development of the soul's powers, or on the absence altogether of some aid to that development. That man's intellectual superiority depends on superiority of bodily structure merely we think few people will now affirm. The structural difference between man and the ape is, indeed, comparatively slight; yet we see in the one case that intelligence is limited in its exercise to the satisfaction of certain wants, and soon reaches a point beyond which it can be developed no further; whilst, on the other, mental exercise is not bounded by any bodily, or even spiritual, want, the capacity for knowledge increasing with every addition made to it.

The true explanation of the inferiority of the lower animals is, that their mental powers, though not imperfect, either in their constitution, development, or operation, and though containing in themselves the germ of all truth, are yet limited in their very nature, and incapable, without the assistance of a higher principle, of reaching beyond a certain range of knowledge. The soul is essentially instinctive; but, superadded to instinct, it possesses the power of storing up its sensational experiences, of recalling them by memory, and of reasoning from them and forming judgments as to their relations. It is observable, however, that although brute reason enables its subjects to reason from past experience as to the proper conduct under particular circumstances, it never enables them to get further. The lower animals have no power of abstraction or generalization, in the proper signification of those words. They do, indeed, sometimes act as though they exercise such a power, but they do not in reality; the appearance of it arising from the intimate connection which always continues in the brute mind between instinct and reason. However perfect may be their reasoning about particulars, it never leads them to the knowledge of general truths, nor even to the remembrance of particular ones, except so far only as they may be influential over present action.

Referring now to the mental actions of man, it may be stated as an infallible formula that, if we add to the results of the mental actions of the lower animals the operation of the principle of reflection, we shall have, as the result, the perfected knowledge of man. If that be

so, the true explanation of the difference between human and brute mental development is to be found, not in any difference in capability of development, but in the fact of the operation of the mental powers being enlarged in man by the addition of a spiritual principle which the lower animals have not. The origin of all mental action is to be traced to certain intuitions which reside in, and may be said to be the life of, the soul. It is their working which is seen in instinct, and to dependence on them the operation of the simple reason of the lower animals owes all its perfection. Those intuitions are all-powerful in brute action; indeed, so much so, that, while they are the great living principles of action, the animal may be said to be merely the instrument by which they work. In man those intuitions are equally influential, and he is, up to a certain period of his life, equally their instrument. As man gains experience, however, he loses his dependence on the intuitions of instinct for the guidance of his conduct, and with the exercise of reflection he gradually arrives at the knowledge of certain principles of truth, on which are founded all the superstructures of his philosophy. But those principles of truth are in reality nothing but the very intuitions which had in infancy guided his hand, now made his own, and become the instruments by which he works for the extension of his knowledge.

We see, then, in man two spiritual principles; one in which the principles or intuitions of truth reside, and the other that which searches out those principles and makes them its own. The first, that which the lower animals possess equally with man, and which is the seat of the will, is the *soul*. The second, that which man alone possesses, is the *spirit*—the seat of that reflection, or higher reason, to the operation of which on the sensations conveyed through the several sensuous organs man's physical science is owing. There are two objections to this theory of a dual spiritual nature, which I must shortly consider. The first, the philological one, is plausible, but, in reality, of no force. It is that the two words, "soul" and "spirit" (the only two names which can be used to denote the two spiritual principles I have named) are both of the same meaning, literally denoting "air" or "breath". It has been said that "soul is coincident with *halitus*, breath, derived from *halare*, to breathe, a root familiar in the words *exhale*, *inhale*, and itself only an enlarged form of the earlier word *æð* or *dð*, a beautiful onomatopœia, expressive in its long, open, vowels of the very act which it designates"; and that "spirit takes us to the very origin of words, resting on the beautiful lisp or whisper with which the breezes quiver the leaves." That may

be quite true ; but it is a remarkable fact that in most languages, and probably in all the older ones, there *are* two such words, having the same ultimate meaning, and yet used as though intended to express different ideas.

As little conclusive is the objection that we cannot imagine more than one kind of spiritual essence, and that, therefore, the idea of a dual spiritual nature in man cannot be true. Such belief is the result, not of reasoning, but of mere prejudice, which, if contrary to fact, must be got rid of as quickly as possible. We know nothing of spirit in its essence, nor what may be the modes of its development. If, therefore, we find certain facts, which cannot be explained without the supposition of there being more than one of such modes, or even spiritual essences, we are bound to receive that supposition as a fact, throwing on one side all our prejudices, whether they are connected with religious belief, or arise from defective scientific education.

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#### THE PROCEEDINGS OF THE ANTHROPOLOGICAL SOCIETY OF PARIS.\*

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THE two last *livraisons* of the *Bulletins* of the Anthropological Society of Paris are now before us, and are fully equal in scientific interest to any of the previous publications which have emanated from the same source. The lucid and comprehensive exposition of the past labours of the Paris Society, with which M. Broca favoured us, and which was published in the last number of the *Anthropological Review*, has placed our readers entirely *au courant* with the past labours of the French Society ; and it will be the future task of the editors of the *Anthropological Review* to give periodical abstracts of the summarized conclusions which are arrived at in the Quarterly Bulletins of the Paris Society.

Enjoying the high privileges of the presidency in 1863 of M. de Quatrefages, with M. Gratiolet as vice-president, M. Broca as general secretary, and MM. Trélat and Dally as annual secretaries, the Society is as efficiently represented as it was during the years when the

\* *Bulletins de la Société d'Anthropologie de Paris*. Vol. iv. First and Second Fascicules—January to May, 1863.

presidential chair was filled by MM. Martin Magron, Isidore Geofroy St. Hilaire, Béclard, and Boudin; and the fact that more than two hundred members are at present enrolled in its books, renders the future prosperity of the Society, so long as it shall continue to be superintended under efficient management, a question of certain success. The interest which the French nation has long taken in sound anthropology, would augur well for the success of the science in that country; and we regret that England has been so tardy in the establishment of an Anthropological Society.

The remarkable work by the Abbé Brasseur de Bourbourg, on the *Quiché Language of Central America*, forms the subject of an able report by M. Pruner Bey. The analysis which he makes of this work is of the most lucid character; and those who have had the patience, or the sorrow, to wade through the tedious and turgid platitudes with which the abbé has filled his work, will feel a pleasure in reading the nine terse pages in which M. Pruner Bey has compressed the few known facts respecting the Quichés. M. Pruner Bey concluded his abstract of the abbé's generalizations by stating that he had examined in the galleries of the Museum twelve skulls of Quiché Indians of Vera Cruz, and that he discovered in them characters slightly different from those ordinarily assigned to the American cranium; thus, while the Mexican skull is brachycephalic, the skulls of the Guatemalan aborigines exhibited a type intermediate between dolicho- and brachycephaly. In a philological sense, while the languages of Mexico and of the North American nations are polysynthetic, the Quiché, Maya, and the language of Yucatan are analytic; in the Quiché an idea can only be expressed by a periphrasis, which in the Aztec is conveyed in one word. The Quiché drama which M. Brasseur publishes, was gathered from the tradition of the natives, and written in European characters shortly after the period of the *Conquistadores*.

M. Pruner Bey also contributes a valuable report on the climate of Egypt, on which Dr. Schnepf has recently published a work. Both these learned authorities agree that the influence of cold and wet on foreigners in hot climates is much more visible than in our latitudes. Dr. Schnepf describes, on the banks of Lake Menzaleh, the existence of a variety of men entirely distinct from the Arabs; and he controverts the opinion of M. Mariette, who considers them descendants of the Hyksos. Dr. Schnepf states that the Hyksos were strangers in Egypt; and the most minute researches do not enable us to find in this country a single foreign family who have prospered and have propagated for many generations. He concludes that the Hyksos,

whether they were Shemites or not, do not appear to have escaped this law, any more than the modern Greeks and Turks. As regards the Jews, Dr. Schnepf denies the cosmopolitanism; and alleging that, amongst the Egyptian Jews of the present day, not one can trace back their descent to the fifth generation, he condemns the Jews to the same destiny as the other immigrants into Egypt—that of extinction. M. Pruner Bey denies these propositions; and to his able report on the subject we must refer for the arguments which he brings forward.

Chile, although its zoological and botanical forms of life have been long studied with success, has many points of interest yet unascertained in its anthropology. A commission, consisting of MM. Bèclard and Rameau, with M. Pruner Bey as reporter, has drawn up a series of interrogatories. Taking the Chileno population in 1854 as 1,340,000 souls, of which 20,000 are foreigners, the population being comprised under Europeans born in the country, and Mestizos. There are some mulattos, but no negroes; whilst only 10,000 pure Indians still survive. The committee put a series of the most searching questions respecting the physical characters of the Araucaños, and contrast the frequently divergent statements of D'Orbigny, Dumoutier and Blanchard, Domeyko, Molina, Smith, and Parish. No author states whether the Araucaños are prognathous or orthognathous; and the committee state that no artificial deformation of the skull appears to have existed amongst the Chilenos. As regards the religious ideas of the Araucaños, no general proposition appears to be laid down; while it is admitted that they believe in a future life, that their Paradise is placed in the west, and that they believe in a good and an evil principle. As regards the Mestizos, their females appear less fertile than the Spaniards, and their greatest vice is drunkenness. All the classes of society include Mestizos, and the race has produced generals and other dignitaries. The committee do not correlate this fact with the form of government adopted in Chile. The reading of this series of instructions produced an animated debate on the questions relative to the colour of the skin, which were alluded to in the report. MM. Pruner Bey, Quatrefages, Dally, Trélat, Sanson, Bertillon, D'Omalius D'Halloy, and others joined in the discussion, which ultimately centered in the question of the "fundamental antithesis" of anthropology—monogeny or polygeny. We shall intentionally pass over the discussion in the present stage of the question, while we express our admiration for the manner in which the contending parties marshalled their arguments.

M. Pruner Bey contributes an entirely original and highly valuable

memoir on the hair as a characteristic of human race, examined by microscopical researches. The paper is of great length; it will eventually appear in the *Memoirs* of the Society. He has compared together transverse sections of the hair of twenty-four great races of mankind; and he also describes the hair of various regions of the body, and on the head of the anthropoid and other apes. He arranges them in a scale, one pole of which is represented by the Papuas, the Boschismen, and the Negroes, with flattened felted hair; the other pole being represented by the Polynesians, Malays, Siamese, Japanese, Túranians, and the Americans, not excepting the Esquimaux; all these types having rounded, smooth, straight hair. The Aryan races are intermediate between these two extremes. The Basques differ from the Aryan stock as much in their hair as by their language. One single hair, when it presents the average form characteristic of the race, can be assigned to its proper ethnic signification. Mixed breeds are recognizable by the fusion and juxtaposition of the characters inherent in the hair of their parents. We have no doubt that this memoir, when all the facts are laid before the scientific public, will prove of the most lasting service to anthropologists, as enabling them to bring to bear microscopical analysis on the question of ethnic distinction.

M. de Mantegazza sends an amusing memoir on the comparative physiognomy of the human races, from which many curious extracts may be made. The Negroes have the neck shorter than any race; the Jews shorter than the Russians. The knee is very low in the Russians. The Esthonians have the largest feet; Negroes have longest, Jews shortest arms. Russians have smallest, Lettons largest hands. Russians have greatest, Tshuvashes smallest feet. M. Mantegazza describes the tibia of the Gaucho, which is curved by long riding, and his great toe, which is separated from the others by reason of the small stirrups they use. The inhabitants of St. Kilda, M. Mantegazza asserts, have the same conformation, which they have acquired by the free use of the great toe, which they employ in climbing the cliffs to obtain the seafowl on which they feed. M. Jouvencel hinted that it would be very interesting to know whether there was any trace of heredity in these deformations. M. Gratiolet remarked that M. Mantegazza's labour was rather an amusing history of the customs, fashions, and caprices of the people which he observed, and had no direct connection with human physiognomy; to which the learned Italian author had given a signification different from that which was generally accepted.

The anatomy and physiology of the brain still continues to be the subject of elaborate memoirs from MM. Gratiolet and Broca. The former gentleman contributes a note on the skull of a paralytic and epileptic idiot deprived of speech, in which the capacity of the cranium was exceedingly reduced, without attaining absolute microcephaly. The right hemisphere of the brain vastly exceeded the left in size. M. Broca called attention to the skull of an idiot, a Negro, and a Mulatress, in which the cerebral convolutions were strongly marked; and described some diseased brains, in which lesions of the posterior third of the third frontal convolution had been accompanied with a privation of the faculty of language.

M. Garrigou laid before the Society some skulls, at least of Merovingian age, which had been derived from a sepulture near St. Acheul. These skulls are of great interest, as well as all the human remains of historical age from the locality. Messrs. Duckworth and Turner brought the subject before the British Association at Newcastle; and we understand that some valuable information will be given shortly to the Anthropological Society of London, coincident with the presentation of some skulls and other remains of "Gallo-Roman" age from St. Acheul, by the President of the Society.

The human jaw from Moulin-Quignon produced an active debate before the Paris Society. On the 16th April, M. de Quatrefages announced the discovery of M. Boucher de Perthes. M. Giralde's observed at the time that the obliquity of the *ramus* and the form of the condyle might be produced by the age of the subject, which should be carefully determined before any race-characters should be assigned to it. On the 7th May, the adverse opinion of the English palæontologists was laid before the Society by M. Giralde's; whilst M. Broca communicated the substance of a letter from Mr. Carter Blake to the same effect. M. Broca, in a caustic speech, was inclined to attribute some of the scepticism of the British palæontologists to the influence both of the Darwinian and anti-Darwinian schools, which united to decry a discovery which was to a certain extent opposed to the conclusions of either party. M. Gosse (fils) laid great stress on the testimony of the witnesses in favour of the authenticity of the jaw, and inquired whether it was expected that M. Boucher de Perthes should summon together the *savans* of the four quarters of the globe before making any new discovery. M. d'Omalius d'Halloy announced that the "Abbeville Conference" would shortly be held, and suggested the postponement of the debate, which was unanimously acceded to.

M. Bertillon contributes a most valuable memoir on the method to

be adopted in anthropology, in which he cites an admirable table of measurements of the circumference of the thorax in the Scotch militia as an example of the method of tabulation and ordination of anthropological statistics. We regret that our space precludes us from an adequate analysis of this most valuable and technical memoir.

M. Boudin, in a memoir which will appear at length, called attention to the singular fact that the number of military exemptions on account of height in France has diminished in a remarkable manner during the last thirty years, and supported this statement by facts and statistics. The average weight of the French soldier, as compared with the Indian sepoy, is as follows :—

			Height. metre.	Weight. kilo.
Sepoy (Madras)	-	-	1.682	50.397
Sepoy (Bengal)	-	-	1.733	58.438
French soldier (chasseur à cheval de la garde)	-	-	1.679	64.500

From the above, it will be seen how much heavier and shorter, both proportionally and actually, is the French soldier than the Hindu.

A report on the origin of the nations of French Senegal, by M. Simonot, terminates the *Bulletin*; in which, however, the concluding parts do not appear. Senegambia, according to M. Santamaria, is peopled by seven distinct families; the Berber, Arab, Mandingo, Sarajoulet, Peulhs, Yoloffe, and Shéréra. M. Santamaria correlates these existing types with the descendants of some of the sons of Noah, mentioned in the tenth chapter of Genesis. M. Simonot leaves to M. Santamaria the entire responsibility of this theory, and proceeds at once to the known physical facts. He seems to assign to the Negro race in Africa a higher intellectual value than some of his contemporaries and colleagues. He lays great stress on the arts of tanning, pottery, metallurgy, etc., practised by the Negroes, and especially upon their sentiment of music. Although constant nudity has excluded from their minds almost every instinct of shame, yet M. Simonot brings one instance to the contrary, to which it is our duty to assign its full value. The memoir is of the most valuable character, and we hope at some future time to lay before our readers an account of its termination.

## ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

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THE scientific carnival of Great Britain has again come and gone. The "wise week", as the good people of Newcastle called it, was on the whole most successful. The profuse hospitality of Sir William Armstrong, and the people of Newcastle generally, will long render this meeting memorable in the annals of the British Association. How far has the science of Anthropology been advanced by this meeting? All branches of science have their own accounts to render; and it is only our duty to examine the amount of advance made in the science of Mankind. Anthropology in name is not yet recognized in theory; but it is to some extent in practice. It is not a little remarkable, that some of those who are most opposed to the recognition of Anthropology as a recognized branch of science into the Association, are the very men who, in their practice at least, admit the claims of Anthropology, and who read papers which are entirely anthropological. For instance, Mr. Crawford, one of England's most consistent and venerable ethnographers, lost no opportunity of protesting against the introduction of anthropological papers into Section E; and yet, with that inconsistency for which he is occasionally distinguished, was one of the very first men in the section to read a paper on a purely anthropological subject. Mr. Crawford's paper, entitled "Notes on Sir C. Lyell's Antiquity of Man", was from the beginning to the end a paper on Man or Mankind, as distinguished from Ethnology, or the science of the Races of Man. No writer of any authority, either English, American, or continental, will now call the question of the antiquity of man an ethnological question. It is pure and simple an anthropological question. Other papers bearing on the same subject, we understand, were rejected by the Committee of Section E, because they were anthropological! and could not be read because Anthropology was not recognized by Section E, which was entirely confined to Geography and Ethnology. But such an example from one of the most eminent Vice-Presidents of the Section, could not fail to have its influence on other members; and the result was that, notwithstanding several anthropological papers were refused by the Committee, still there were a larger number accepted. An analysis of the papers read in Section E gives the following results. There were altogether forty-one papers an-

nounced to be read before the Section; eighteen of these were geographical, nine were ethnological, and fourteen anthropological. Besides, there were several anthropological papers, which were not accepted by the Committee simply because they *were* anthropological. Most of the geographical papers, we believe, were original; but there were only five out of nine of the ethnological papers which had not been read before, and, in the words of the President, "amply discussed" in London. All the anthropological papers read before Section E, including two which were not read, were, with one exception, never read or discussed before any other scientific body. It will, then, be seen that anthropologists have yet much work to do before their science can be generally recognized. But, as far as practice goes, they have cause for satisfaction; and the recognition of Anthropology in theory must soon follow its recognition in practice.

On the whole, therefore, we have no hesitation in saying that the general result of the meeting must be considered satisfactory to anthropologists. Several circumstances combined to make Section E one of the most popular sections, as, indeed, it always has been when at all properly conducted. In the first place, the Section was presided over by the prince of presidents, who was a host in himself, and who, we are bound to admit, contributed far more than any other man to make Section E popular and its proceedings satisfactory. Sir R. Murchison was free from the littlemindedness shewn by some of his associates. His whole conduct in the chair was both fair and honest; and all his exertions were used to render the meeting agreeable to all parties. Thus, we know he frequently felt it his duty to remain at his post to his own serious inconvenience. We can only regret that his other high duties, as one of the chief rulers of the Association, caused him to occasionally absent himself. There was no one at all capable of filling the post like Sir Roderick. It is no disparagement that his two countrymen, who acted occasionally in his absence, were far from being so successful in their presidency as their eminent friend. These statements are acknowledged truisms: but we are bound to say that even Sir Roderick occasionally failed to give satisfaction to all parties. We have received several letters complaining of "the apparent puff" which Sir Roderick appended to his introductory address! We certainly were ourselves a little surprised to hear Sir Roderick coolly enumerate a list of ethnological papers to be read before the Section, most of which, as we have stated, had been read long ago, and were "stale, flat, and unprofitable". Out of the six ethnological papers which Sir

Roderick announced to be read, there was only one which had not been read before! In a previous part of his address, he had mentioned some of these papers as having been "*read and amply discussed*". As to the strong remarks we have received respecting this part of the President's address, we would observe that in all cases they have been from those who were not personally present to witness the support and courtesy which Sir Roderick invariably gave to anthropological papers and to anthropologists. We would also observe, that Sir Roderick gave a *vis à voce* statement, which was not printed, at the end of his address, in which he acknowledged the valuable additions of papers the Section was likely to have from the representatives of the Anthropological Society of London. Nor do we think that Sir Roderick meant to do more in what he said than give his aid to ethnological science. We feel sure that he cares far too much for truth to care for any one set of men more than another. We ourselves are grateful for any aid he renders to ethnological science. We are as much interested in the result of ethnological science as of general Anthropology. There may be difference of opinions as to the best means of advancing the Science of Mankind; but we are sure that there is no difference of opinion as to the importance of Ethnology, or the Science of Races. Nor do we think that any man is worthy of the name of an ethnologist, who looks with disfavour on those anthropologists who believe that the Science of Mankind embraces something more than Ethnology. Rather ought they to rejoice to see the great success which is attending the labours of their fellow-workers. The British Association is for the advancement of science, perfectly regardless of personal opinions or party cliques. We feel sure, therefore, that it only requires a little time to remove any jealousy that may exist in the breasts of some ethnologists respecting the success attending the labours of anthropologists. Let them learn not to quarrel with the decrees of Nature. Astronomy was not arrested in her progress by the clamours of the astrologers; nor will anthropologists cease to develop the extent, magnitude, and importance of their science by the invectives of ethnologists. Rather let them develop their own subject, and look with rejoicing on the beneficent way which will ere long raise them from their present state of isolation, and raise them to their place as one of the branches of light which will illuminate the great system of organic life.

We will now give a general abstract of the anthropological papers read at the Association. On a future occasion, more of these papers will be printed at length. We have classed the papers under two

heads: General Anthropology;\* and one special branch of that subject—Ethnology.

#### GENERAL ANTHROPOLOGY.

*On Anthropological Classification.* By Dr. JAMES HUNT, F.S.A., President of the Anthropological Society of London.—After the author had given a short outline of the nature of the subject, in which he distinctly stated that the origin of man belongs entirely to mythical times, and is a question which could not at present be solved by human experience, he proposed merely to classify man as he now exists, or as he has existed since the historical period, without reference to those distinctions being absolutely original. It was Dr. Hunt's duty to inquire—were these well-defined differences in mankind at the earliest dawn of history? a question which he answered in the affirmative, as the ethnology of the most anciently known continents is very much the same as at the present day. He considered also that these differences had been permanent; and the scope of the present paper was to inquire whether these physical differences were so well marked as to serve as the basis of classification. He reviewed the classifications of Ephorus of Cuma, Buffon, Linnæus, Gmelin, Herder, Voltaire, Blumenbach, Lacépède, Duméril, Maltebrun, Cuvier, Virey, Hunter, Lawrence, Metzan, Bory, Desmoulins, Prichard, Lesson, Fischer, Morton, Latham, Hombron, Jacquinet, D'Omalius D'Halloy, Pickering, Burke, Knox, Agassiz, Crawford, and Isidore Geoffroy St. Hilaire, and offered critical remarks on each of these systems as a whole. Many of them were of the most arbitrary nature, the offspring of chance or human fancy, unfounded on the knowledge of any ascertained facts, and there was no attempt to define the method on which a sound anthropological classification might be based. The multiplicity of the systems at present in vogue is a sufficient refutation of the truth of most of them. Dr. Hunt considered that anatomy and physiology were the primary sources whence an adequate knowledge of the principles of anthropological classification could be derived. Language he considered no test of race. He laid great stress upon the form of the cranium as the most convenient and certain distinctive mark, and spoke with great approval of the ternary classification adopted by Gratiolet, who divides mankind into the Frontal (European), Parietal (Mongol), and Occipital (Negro) races—these cranial distinctions being coincident with the mental and moral characters which were

\* To those papers which were not read before Section E, we have affixed the letter of the Section after the title of the paper.

solely dependent on man's physical structure. Other secondary physical characters could also be used with advantage; and Dr. Hunt especially alluded to the classifications which might be based upon colour, stature, hair and beard, longevity, diseases, temperaments, odour, entozoa, and other subsidiary points of distinction. The degree of intelligence was the chief character distinguishing man from the inferior animals. If a classifier of the negroes of the West Indies were to use language alone as a criterion, he would classify them under the head of Europeans, with whom their acquired language is identical; their physical characters alone mark them as African. Dr. Hunt considered that language must be utterly discarded as the first principle of anthropological classification. He gave a far higher value to religion, and to art, considering language merely as the third element. It was possible to change the language of a race; but apparently impossible to change either their religion or their innate ideas of art. That there are well-marked physical, mental, and moral distinctions in mankind is as well an ascertained fact as that there are differences in the orang and the chimpanzee. We must, therefore, classify mankind according to the physical, and psychological differences which now exist, for the present state of anthropology will not enable us to say how and when these distinctions have originated.

*Cranioscopy of South American Nations.* By MR. C. CARTER BLAKE, F.G.S., F.A.S.L.—The object of the paper was to re-consider some of the primary principles on which those cranioscopists who have classified the races of South America, have based their arrangements, and to call especial attention to a few important exceptions which appear to invalidate the generalisations commonly accepted. ✓ Every practical cranioscopist is aware that Retzius's classification of human skulls into brachycephalic and dolichocephalic was applied by that illustrious Swede to the arrangement of the great leading South American types. The lamented and deceased cranioscopist gave, as examples of the brachycephalic type, as exhibited in South America, the tribes of Ecuador, Peru, Bolivia, Chile, La Plata, Patagonia, and Tierra del Fuego; while the dolichocephalic or longheaded type found its representatives in the populations of Carib, Guarani, Brazilian, Paraguay, and Uruguay origin. This broad generalised statement of facts still remains the accepted and predominant hypothesis. How far is it consonant with the extent of our knowledge on the subject? Those few tribes and nations of South America of which any accurate and reliable information exists will be briefly recapitulated in the

following observations, and especial attention drawn to the *desiderata* which appear in our collections. The geographical order will be adhered to, apart from any broad generalisation, which may arise, based on craniometrical classification; such generalisations, *e.g.*, as that of Morton, who divided the whole American races into two great families, the Toltecan, comprising the extinct half-civilised tribes which have become extinct during a pre-historic period, and the barbarous tribes. The latter division was subordinated amongst the Appalachian, Brazilian, Patagonian, and Fuegian branches. Mr. Blake then proceeded to criticise these types in detail. In the first place, he pointed to Colombia; the characteristic type prevailing amongst the tribes of Venezuela is the Carib. The skull is here markedly long-headed, with the parietal diameter less than the longitudinal. The frontal bones are strongly flattened; the zygomatic arches large. Accurate and reliable evidence respecting the cranial conformation of the natives of Ecuador is wanting. The Cara and the Scyri unknown. There were several types in Peru; *e.g.* the Chinchua type shorthheaded; the Chimu type longheaded, so far as known; the Inca or Quichua shorthheaded, flattened from before to behind by compression from the frontal bone to the occiput. In Bolivia there were the Aymar , longheaded, of which few examples existed in our collection; the Titicacan, longheaded, but of whom the other physical characters are unknown. In Chile the type was longheaded, so far as known at the present day. The Anthropological Society of Paris has recently sent a series of queries respecting the physical characters of the Chile races, which showed the utter want of information on this topic. In Patagonia the type was also longheaded, as in Tierra del Fuego, Paraguay, La Plata, and Brazil.

Commodore MAURY asked the author of the paper whether there was any relation between the distribution of any of the cranial types alluded to and the distribution of the inland basins. An attention to physical geography would, he was confident, throw much light on the question of race.

Mr. MARKHAM pointed out that the Quichua and Aymar  tribes were distinct as regards language. The Aymar  language was as distinct from the Quichua as the Italian from the Spanish. The Chinchas were far more nearly allied to the Quichuas than were the Aymar s.

Mr. CRAWFORD, after complimenting the author of the paper on the industry with which his materials had been collected, denied that craniology afforded us any sound knowledge of the affinities of races. He would tell an anecdote which was entirely new to the British Association. Professor Owen on one occasion had described a skull

which was really that of a Scotchman, as that of a Negro. Therefore, Mr. Crawford concluded that knowledge of the cranium was no guide to the affinities of races. He complained that Mr. Blake had not offered any generalisation as to the number of indigenous stocks in South America, and stated that no such generalisation could be arrived at by mere craniology.

After a few remarks from Mr. GREENFIELD,

Dr. JAMES HUNT said that he had intended not to offer any remarks on the interesting paper that had just been read, but he could not silently listen to the observations of Mr. Crawford without rising to protest to the British Association against the sneers which Mr. Crawford was in the habit of casting in the teeth of anthropologists who devoted themselves to the science of man. Section E. had become notorious for their neglect of all true science relating to man. All other sections made advance from year to year, but Section E. did not. The same subjects were discussed every year, and no progress was made or would be until anthropology became recognised by the Association. Many men of science devoted to this subject despaired of doing any good by attending the Association. Dr. Hincks said yesterday that Mr. Crawford was entirely ignorant of the science of language, and he was obliged also to say that his friend, Mr. Crawford, was not competent to judge of the value of craniology as a basis for the classification of man. It was useless to argue with one who rejected both physical and physiological characters as a basis of classification, and one who was also opposed to the evidence of language.

Professor WILSON said he was sorry that it had been suggested that the subject under discussion was of no importance. He was not a craniologist, and therefore would not presume to offer an opinion upon the questions at issue, but he would mention a fact which had some bearing upon them. He was acquainted with a hatter in Canada, carrying on an extensive business both with the English and French communities. He took the measure of his customers' heads according to the Paris fashion, and he (Dr. Wilson) had collected the models—upwards of a hundred—and, with the assistance of a scientific friend, had classified them, without referring to the names affixed to them, in two distinct groups, the English and the French. Upon examining the names, it was found that, with two or three exceptions, they had made a perfectly right classification, though the only data they went upon was the shape of the skull. The science of craniology might have been carried too far, but he was sure it was calculated to lead to very valuable results. There were no doubt distinct national types of skulls, and he hoped that anthropologists, instead of being disencouraged would receive every encouragement from the British Association.

Mr. CARTER BLAKE, in reply, agreed with Captain Maury with respect to the advantages which were derived from a comparison of the cranial types with the geographical localities. He answered Mr. Crawford's complaint respecting the absence of any generalizations respecting the origin of the South American natives, by saying that he was quite content to wait and accumulate facts. As regards Mr. Crawford's amusing anecdotes, he was afraid his learned friend had put the

cart before the horse. Professor Owen did not mistake the skull of a Scotchman for that of a Negro; it was a Negro skull he mistook for that of a Scotchman. Physical characters alone could decide the affinities of a race; and as Mr. Crawford had rejected the test of language, he failed to perceive what the characters were on which his classification was founded.

Sir RODERICK MURCHISON, after commending the learning and ability of the paper, hoped that the science of anthropology, which had been founded by his friends, Blumenbach, Retzius, and Von Baer, would ere long be recognised by the scientific world.

*On the Physical and Mental Characters of the Negro.* By Dr. JAMES HUNT, President of the Anthropological Society of London.—The author said he had been collecting facts upon the subject for another society; but he was induced to bring it before the Association from the fact that it had never been brought before a scientific audience in England. In discussing the question, he would have nothing to do with anything but the full-blooded, woolly-headed, typical Negro, to the exclusion of the half-breed. The object of the paper was to determine the position which one well-defined race occupies in the genus *homo*, and the relation or analogy which the Negro race bears to animated nature generally. He had selected the Negro race, as it seemed to be an intermediate form between the highest and lowest existing races of man. In discussing the question, he had nothing to do with the origin of man, for analogies did not necessarily include relationship. The skin and hair are by no means the only things which distinguish the Negro from the European, even physically; and the difference is greater still mentally and morally. The skeleton of the Negro is generally heavier, and the bones are larger and thicker, in proportion to the muscles, than those of the European. The bones are also whiter, from the abundance of calcareous salts. The thorax is compressed; the leg is longer than in Europeans, but is made to look shorter on account of the ankle being only between  $1\frac{1}{3}$  in. to  $1\frac{1}{2}$  in. above the ground; the heel is both flat and long. Burmeister has pointed out the resemblance of the foot and the position of the toes of the Negro to that of the ape; and many observers have noticed that the Negroes have frequently used the great toe as a thumb. After pointing out several minor particulars, in which the Negro differs from the European, and quoting the opinions of several writers on the capacity of the Negro cranium, the paper recommended caution in accepting such capacity of the cranium as any absolute test of the intellectual power of any race. The brain of a Negro has a smoky tint, not found in that of an European. The hair is essenti-

ally different; and the voice resembles sometimes the alto of an eunuch—there being a peculiarity about it by which he can always be distinguished. Dr. Louis Büchner, after summing up the peculiarities of the Negro, says they exhibit the most decided approach to the ape. Other distinguished anatomists and physiologists had expressed a similar opinion. The assertion that the Negro only requires an opportunity for becoming civilized is disproved by history. The African race have had the benefit of the Egyptian, Carthaginian, and Roman civilization, but nowhere did they become civilized. The many cases of civilized blacks are not pure Negroes; but, in nearly every case where they had become men of mark, they had European blood in their veins. In the West Indian Islands it has frequently been observed that all the Negroes in places of trust which require intelligence have European features. Negro children are precocious; but no advance in education can be made after they arrive at the age of puberty—they still continue mentally children. It has been said that the present slave-holders of America no more think of rebellion amongst their full-blooded slaves than they do of rebellion amongst their cows and horses. That was because the tranquillity of Negroes in their approach to civilization resembled the content of domestic animals. From all the evidence brought forward, the writer of the paper saw no reason to believe that the pure Negro ever advances further in intellect than an intelligent European boy of fourteen years of age. After citing authorities to prove the low psychological character of the Negro, the paper continued:—"We now know it to be a patent fact that there are races existing which have no history, and that the Negro is one of these races. From the most remote antiquity, the Negro race seem to have been what they now are." The writer could see no evidence to support the opinion of some writers that the Negro had degenerated from some higher form of civilization. Everywhere we see the European as the conqueror and the dominant race; and no amount of education will ever alter the decrees of Nature's laws. The general deductions he would make were—First, that there is as good reason for classifying the Negro as a distinct species from the European as there is for making the ass a distinct species from the zebra; second, that the Negro is inferior intellectually to the European; third, that the analogies are far more numerous between the Negro and the ape, than between the European and ape. There was in the Negro that assemblage of evidence which would induce an unbiassed observer to make the European and Negro two distinct species.

Mr. GALTON said that the case was briefly this:—Among the Negroes

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of Africa there were more frequent instances of an abject and superstitious character, combined with brutal behaviour, than could be paralleled elsewhere in the world. It was a wonder that people like those of Dahomey could mould themselves into any form of society at all, and it was actually found that when the chief of such a tribe died it disintegrated and rapidly disappeared. In short, the tribes of Africa were remarkable for their rapid formation and short continuance. Many of their chiefs were of alien descent, and it was remarkable how their greatest kingdoms had been ruled by Tawareks—men with Arab blood—or, as Captain Speke now informed us, by straight-haired Wahumas. How did it happen, then, that so degraded a people could furnish men capable of constructing nations out of the loosest materials? The question once stated was almost its own reply. The Negro, though on the average extremely base, was by no means a member of a race lying at a dead level. On the contrary, it had the capacity of frequently producing able men capable of taking an equal position with Europeans. The fact of a race being distinguished by the diversity of its members was well known to ethnologists. There were black and red sub-divisions of many North African races, and the contrast between the well-fed and ill-fed classes of the same tribe of Negroes was often such as to amount apparently to a specific difference.

Mr. CRAFT said that though he was not of pure African descent he was black enough to attempt to say a few words in reference to the paper which had just been read. Many scientific gentlemen present would probably dispute that; but at any rate, supposing Adam to have been the founder of a race of men, white men had no stronger claim to him as their father than black men, as it was admitted that owing to the climate in which he commenced his existence, he could have been neither black nor white, but copper coloured. As Africans were very dark, and the inhabitants of Northern Europe very fair, and as, moreover, the nations of Southern Europe were much darker than those of Northern Europe, it was perfectly fair to suppose that climate had a tendency to bleach as well as to blacken. The thickness of the skull of the Negro had been wisely arranged by Providence to defend the brain from the tropical climate in which he lived. If God had not given them thick skulls their brains would probably have become very much like those of many scientific gentlemen of the present day. The woolly hair was not considered by Africans as a mark of inferiority, though some of them shaved it off, but it also answered the purpose of defending the head from the sun. With regard to his not being a true African—his grandmother and grandfather were both of pure Negro blood. His grandfather was a chief of the West Coast; but, through the treachery of some white men, who doubtless thought themselves greatly his superiors, he was kidnapped and taken to America, where he (Mr. Craft) was born. He had recently been to Africa on a visit to the King of Dahomey. He found there considerable diversities even among the Africans themselves. Those of Sierra Leone had prominent, almost Jewish features. Their heels were quite as short, on the whole, as those of any other race, and upon the

whole they were well formed. Persons who had any knowledge of Africans knew that, when they enjoyed advantages, they were capable of making good use of them. He might refer to the instance of the little girl brought to this country by Captain Forbes. This child was presented to the Queen, who had her carefully educated. When she grew up, she mingled in good society, and interested every one by her proficiency in music, and recently she had been married to a commercial gentleman of colour at Lagos. Another case was mentioned by Mr. Chambers in one of his works, and another case was that of Mr. Crowther, who was well-known to many gentlemen in this country. One word with reference to the ancient Britons. When Julius Cæsar came to this country, he said of the natives that they were such stupid people that they were not fit to make slaves of in Rome. It had taken a long time to make Englishmen what they now were, and, therefore, it was not wonderful if the Negroes made slow progress in intellectual development. It was, however, proved that they made very rapid progress when placed in advantageous circumstances. As to the Negro not being erect, the same thing might be said of agricultural labourers in this country. He pointed to Hayti as furnishing an instance of independence of character and intellectual power on the part of the Negro, and contended that in America the degraded position which he was forced to occupy gave him no chance of proving what he really was capable of doing. He was sorry that scientific and learned men should waste their time in discussing a subject that could prove of no benefit to mankind. He spoke with great deference to their opinions, but, for his own part, firmly agreed with Cowper that—

Fleecy locks and black complexion  
 Cannot alter nature's claim;  
 Skins may differ, but affection  
 Dwells in white and black the same.

The Rev. H. B. TRISTRAM said he had been a chaplain for several years in a mixed school for blacks and whites in one of the West Indian islands, and could testify that the children of free Negroes who were engaged in honourable occupations were invariably more intelligent than the children of slaves.

Mr. CARTER BLAKE said that he agreed substantially with the author of the paper upon the anatomical evidence which he had brought forward with regard to the Negro race. Mr. Craft had stated that the heels of the Negro were not longer than those of Europeans, but that was contrary to the testimony of anatomists. He contended that in nearly every instance of a Negro attaining intellectual eminence it had been ascertained that there was an admixture of European blood in his veins. The evidence of the paternity of full-blooded African Negroes, in contact with Europeans, was rather difficult to ascertain. Anatomists had ascertained that there were wide differences in the structure of the Negro and European, and he specified some instances of such diversity. If the woolly hair and thick skull of the Negro were given to him by a bountiful Providence to fit him for living in a tropical climate, the inhabitants of Brazil were suffering great

injustice, for they had neither woolly hair nor thick skulls. With regard to the philanthropic element, he thought it ought not to have been introduced into the discussion. In conclusion, he expressed his opinion that, till Mr. Craft could rail away the seal which nature had impressed on the physical character of the Negro, his breath was all spent in vain when he contended for the equality of the African and European races.

Sir E. BELCHER said that he had spent nearly all his life among the Africans, and believed that, when properly educated, they could be as true, as faithful, and as sound-hearted as Englishmen. He mentioned several instances which he had met with in his travels of remarkable intelligence in the Negro, and scouted the idea that he was naturally, either physically or mentally, of inferior capacity to other human races.

Professor WILSON claimed for the author of the paper and those gentlemen who supported him, the credit of being influenced by a desire to search out facts which could throw a light on the important subject under discussion. At the same time he differed considerably from them in some of their conclusions. It was very important to have sufficient data before forming a theory, and he thought that Sir Charles Lyell and others who contended that the intellectual progress of the Negro stopped at the age of fourteen, had fallen into the error which a person would who went into a workhouse among the most degraded and wretched of its occupants to find intellectual culture and capacity. The fact was that very few, if any, black children had any opportunity of pursuing their education after the age of fourteen, and, in addition to that drawback, they had the misfortune to belong to a degraded and oppressed class, which was crushed and held down in the social world. The wonder was that any of these unfortunate people had energy enough to make their escape and to acquire knowledge sufficient to enable them to carve a way for themselves through life as not many of them did. The English character was made up of many elements; but a few hundred years ago the inhabitants of this island were cruel, unlettered, practical people. When put under good training and subjected to certain influences the Anglo-Saxon proved capable of remarkable development, owing chiefly to the native energy of his character. The same quality was observable in some tribes of the present day, such as the New Zealander, and it was not wise therefore to argue as though the absence of combination denoted a natural and primary inferiority of race.

Mr. CRAWFORD made a few observations on Negroes generally.

Dr. HUNT in reply said he was sorry that some speakers had attempted to draw away the attention of the audience from the great facts under discussion. Scientific physical facts had been met with vague general assertions, and no reply had been attempted to be made by any speaker against the facts that had been adduced. He would leave his scientific friends to judge of the value of Mr. Craft's remarks. He was sorry, however, that the speaker had not confined himself to uttering exploded theories, but had accused scientific men of wasting their time when discussing this subject. He for one

thought it was a great pity that scientific men in this country had so long delayed to bring these facts prominently before the public, and thus explode some of the popular delusions on the subject. It was not at all necessary for Mr. Craft to tell anyone at all acquainted with the subject that he was not a pure Negro, although there were many present who were deluded with the idea that he was. As to the statement that Britons did not make good slaves, he was quite ready to admit the fact; and he knew of no European race that would make good slaves. In this respect Negroes were certainly far superior to Europeans. He then briefly replied to other speakers, and in conclusion, said the time was passed when the great fact he had brought forward could be longer ignored, and however reluctant he had been to introduce the topic, he felt that good would arise from the discussion that had taken place. All he asked was that scientific evidence of this character should be met by scientific argument, and not by poetical clap-trap, or by gratuitous and worthless assumptions.

*On Cranial Deformities, more especially on the Scaphocephalic Skull.*

By WILLIAM TURNER, ESQ. (D a.)—The Author commenced by stating that deformities of the skull might be occasioned by artificial means, by pathological changes, by posthumous changes, and by developmental irregularities and deficiencies. He in a great measure restricted himself in his paper to a consideration of the effects produced on cranial form by developmental irregularities and variations in the mode of ossific formation, more especially by premature or retarded union of the cranial bones along their sutural lines and at their synchondroses. He arranged the sutures connecting the bones of the skull cap into a vertical-transverse group, a median longitudinal, and two lateral longitudinal groups; and agreeing with Professor Virchow, of Berlin, he stated that should a premature ossification take place in one, or more than one, of the whole, or a part, of a line of sutures, then the growth of the skull corresponding to, and in a direction perpendicular to the line of synostosis will occur, and diminished length, or breadth, or height, as the case may be, will be occasioned. He illustrated this proposition by describing a peculiarly elongated and laterally compressed form of skull to which, along with Professor Von Baer, of St. Petersburg, he applied the name Scaphocephalus. Four as yet undescribed examples of this peculiar boat-shaped skull had come under his notice. The whole of these crania were characterised by possessing the following characters:—Absence of a sagittal suture, and consequent blending of the two parietal bones; absence of parietal eminences, lateral compression, great elongation. He then discussed at length the two theories which had been advanced to account for the production of such a form of skull;

and concluded that the balance of evidence was in favour of the theory that it originated from a premature union of the sagittal margins of the two parietal bones, and consequent compensatory growth of the skull in the antero-posterior direction, rather than from the development of the bi-parietal bone from a single median vertical centre. The author then directed attention to the importance of attending to the above proposition in ethnological inquiry, more especially with reference to the production, through its action, of various aberrant forms of skull in individuals of any given nationality, which may cause them to possess a shape of head quite different from that of the race to which they belong. He pointed out, moreover, that obliteration of the sutures to a greater or less extent exists in the crania of the Flathead Indians, which have been distorted by artificial means; his observations agreeing with those of Professor Daniel Wilson in this particular. He was of opinion that the pressure occasioned the tendency to premature union of the bones in these cases. The author did not think that persons possessing crania the form of which had been modified by premature synostosis necessarily exhibited any special tendencies to cerebral disease or deficiencies in their mental capacities.

*Human Cranium from Amiens.*—Mr. WILLIAM TURNER read a few notes, by Mr. Henry Duckworth, on the circumstances attending the discovery of a human skull at Amiens, and also a short paper of his own on the anatomical characters of the said cranium. The skull was produced and exhibited before the section. The cranium was found by Mr. Henry Duckworth, F.G.S., in the summer of 1861, whilst on a visit to the quarries of St. Acheul. It was dug out of the deposit named by the workmen the “*Découvert*” Bed. Its depth from the surface was about six feet. The anatomical description by Mr. Turner comprised an account of the appearance of the bones, and of the form and general characters of the skull. One of the most interesting points connected with it being its remarkable resemblance to the much discussed “*Engis*” skull, of which it might almost have been considered to have been a reduced copy. There was nothing in the appearance of the skull, or in the circumstances of its discovery to lead to the supposition that it threw any light on the question of the antiquity of man.

Mr. R. A. GODWIN-AUSTEN thought that the discoveries at Amiens had no bearing on the antiquity of man, as the whole of the locality had been a burying-place for an enormous period of time. He had visited the locality where the skeleton was dis-

covered, from which the famous jaw-bone, which had attracted so much attention, was taken; and he believed that the deposit there was nothing but an accumulation of drift from the chalk hills which overhung that particular spot.

*The Neanderthal Skull.* (C.) Professor WILLIAM KING gave reasons for believing it to belong to the Clydian period, and to be specifically distinct from man. He contended that the Neanderthal man was living in the concluding division of the glacial or Clydian period. He felt it necessary to advert to a question involved in the present subject, and on which a preconceived opinion, amounting to a prejudice, is pretty generally entertained. Some authors have no hesitation in admitting that the genus *Homo* has been represented by more species than one now living; but there is unquestionably prevailing a deep-rooted conviction that the psychical and speech endowments of *Homo sapiens* are generic; although there is nothing to warrant such a belief, and much to oppose it. He saw no reason to doubt that there have been species of the genus in existence, unpossessed of those gifts which so eminently place the existing human races, but in different degrees, above the highest anthropoid apes. Why may there 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? Man's psychical endowments are visibly expressed in the prominent frontal and the elevated vertex of his cranium. But considering that the Neanderthal skull is eminently simial in its great characters, he felt himself constrained to believe that the thoughts and desires which once dwelt within it never soared beyond that of the brute. The Andamaner indisputably possesses the dimmest conception as to the existence of the Creator in the universe: his ideas on this subject, and on his own moral obligations place him very little above animals of marked sagacity, nevertheless they are such as to specifically identify him with *Homo sapiens*. Furthermore, the strictly human conformation of his brain-case bears out the collocation. Psychical gifts of a lower grade than those characterising the Andamaner cannot be conceived to exist: they stand next to brute benightedness. Applying these arguments to the Neanderthal skull, and considering its close resemblance to that of the chimpanzee, and, moreover knowing that the simial peculiarities are unimprovable—incapable of moral and theositic conceptions—he saw no reason to believe otherwise than that similar darkness

characterised the beings whom he did not hesitate to call *Homo Neanderthalensis*.

*The Anatomy of a Young Chimpanzee.* By Dr. EMBLETON (D a).—On the 11th December, 1862, the body of a male chimpanzee, said to be about one year and a half or two years old, and which had died of bronchopneumonia, in a menagerie, at Newcastle, was purchased for the College of Medicine. It was scantily covered with black hair, except around the muzzle and arms, where the hair was silvery grey. It was fresh and in good condition, the trunk rather bulky, the chest large, the arms strong and muscular, the hands partly covered on the dorsum of the palm with black hair, which did not extend to the fingers, the palm or surface smooth, naked, and of a dusky flesh colour, the thumb small and short, measuring with its metacarpal bone, 2 in., the middle finger being 5 in. long, the legs comparatively short and weak, but fleshy to the heels, the feet rather more covered on the dorsum with hair than the hand, the toes and the soles resembling in smoothness, absence of hair and colour, the corresponding parts of the hands, the great toe freely detached from the others, and resembling a strong thumb, measured with its metatarsal,  $2\frac{1}{2}$  in., the third toe,  $3\frac{1}{2}$  in. The thumb appeared much shorter, slenderer, and weaker than the other fingers; the great toe thicker, stronger, and shorter than the other toes. The following dimensions of parts were carefully taken:—Length from vertex to the sole of the heel, 2 ft. 5 in.; length from top of sternum to tuber ischii, 1 ft.  $\frac{3}{4}$  in.; length of leg from top of femur to sole,  $11\frac{1}{2}$  in.; length of arm, from head of humerus to tip of middle digit, 1 ft. 5 in.; length of hand and foot, each  $5\frac{1}{2}$  in.; circumference of chest at broadest part, 1 ft.  $4\frac{3}{4}$  in. The whole body weighed 16 lb. 6 oz. avoirdupois. Owing to its tender age, and the necessity for preserving it, the skeleton was not much studied, and time did not allow of dissection of much of the muscular system. It may be observed, however, that there exist thirteen pairs of ribs and, therefore, thirteen dorsal vertebræ, and in consequence the number of lumbar vertebræ is reduced to four. The diaphragm was well arched, and very strong; the psoas parvus muscle was present, and attached as in a man. The skin, arranged by Mr. John Hancock, according to the exact dimensions and form of the animal, was deposited in the museum of the Natural History Society, and the skeleton, carefully prepared by Thomas Craster, in the collection of the College of Medicine. A dissection of the muscles and tendons of the palm of the hands is shown in sketch F. It was observed that the opponens pollicis muscle was

wanting; the others appear to be disposed as those of the human hand. Professor Huxley having maintained, in his *Man's Place in Nature*, that the hind limbs of the so-called quadrumane is not a hand, but in reality a foot, it was necessary to direct particular attention to the muscles and tendons of that part. Sketch C shows the posterior region of the leg, which is flat, and rather broad, and the fleshy parts of the lateral muscles are continued down to the ankles; the gastrocnemii are the principal features hiding the presence of the soleus, and the absence of a plantaris. Sketch B, fig. 1, presents the anterior region and the dorsum of the foot. The peroneus brevis, which is inserted into the fifth metatarsal, arises here above the peroneus longus, the tendon of which, passing behind the outer angle, runs obliquely into the sole of the foot.

Next internal to the peronei lies the rather slender extensor longus digitorum, the four tendons of which pass to the four outer toes. Between this muscle and the edge of the tibia lie three muscles, one being a good deal overlapped by the other two. These two send their tendons to be inserted, the *inner* into the inner side and under part of the first cuneiform bone, the *outer* into the base of the metatarsal bone of the great toe. The third muscle, at first deeply placed, comes out, a little above the ankle, from beneath the other two, and its tendon, lying between that of the outer of the two and the tendon of the long extensor, runs to be inserted upon the dorsal surface of the base of the first phalanx of the great toe. On the dorsum of the foot we find the short extensor of the toes, a broader muscle, and extending further towards the inner side of the foot than in man, by means of considerable superadded slip, which diverges abruptly inwards from the other part of the muscle, sends its tendon along the metatarsal bone of the great toe parallel with the tendon of the last muscle, to be inserted into the base of the second or terminal phalanx of that toe.

Every toe, then, in the chimpanzee, has at least a long and a short extensor for its phalanges, whilst the great toe has an extensor for its metatarsal, another for its cuneiform bone. Thus it may be said that there are four muscles of the great toe to ensure free and varied mobility in the sense of extension; the fifth toe has, as in man, in addition to its phalangeal extensions, the peroneus brevis attached to its metatarsal. Of the four extensions of the great toe, the two innermost appear to represent the tibialis anticus of human anatomy, divided to secure variety of motions in the root of the great toe; the next would quite answer to the extensor proprius pollicis only; it is inserted

into the base of the first instead of the terminal phalanx ; the fourth or short extensor is a new foot muscle, and unrepresented in either the hand or foot of man. Thus, in the peroneal region, and in that of the extensor, we find all the corresponding human muscles represented ; moreover, there are certain modifications of arrangement, and a new muscle for the first digit introduced, to give more freedom and variety of movement in extension to that member. This muscle is a foot muscle, not a hand one ; the divided tibialis anticus is rather a foot than a hand arrangement. There are no hand muscles introduced, though the great toe has four, and the thumb three extensors. There is here a great toe, more moveable in extension than any thumb.

We now turn to the sole of the foot. The three superficial muscles, the abductor pollicis, the flexor brevis digit., and the abductor minimi and digitorum are, as in the human sole, the first to come into view. On detaching the two last from the heel bone, we find, towards the outer border of the foot, a flexor brevis minimi digiti, and in the middle region the lumbricales and the tendons of the long and short flexors of the toes, with a small muscle accessory to the lumbricales arising from the long flexor tendon before its division. No muscular accessories arising from the os calcis and attached to the long flexor tendon were observed. At the outer border of the foot, when we abduct strongly the great toe, which can thus be brought to nearly a right angle with the rest of the foot, we see, after a little dissection, the abductor pollicis as a short doubly reuniform muscle, extending from the heel to the base of the first phalanx of the great toe, occupying considerable space, and close to it lie the two halves of the flexor brevis pollicis, separated by the tendon of the flexor longus pollicis. Lastly, between the great toe and the second is clearly to be observed the abductor pollicis. All these muscles of the great toe are highly developed and of great power ; and, if they all act together, will very forcibly pull the great toe towards the middle of the sole of the foot ; if the flexors of the other toes are made to act at the same time, the result will be a strong, rather oblique opposition of the great toe to the other four toes ; and if an object like the branch of a tree be placed in the sole, it will be grasped with much firmness. There remains, however, to be noticed an interesting arrangement by which that action will be enforced and made more secure. It is this : the muscle called flexor longus pollicis is largely developed in the leg, extending down to the inner ankle, and ends in a strong tendon, which runs into the sole of the foot close to the os calcis, and apart, as in man, from the other tendons, opposito

to the foot of the great toe, it divides into two slips; one, the lesser, runs outwards at a certain angle, being confined at first under a strong ligament, as under a pulley, to the great toe, as its long flexor tendon; the other, the larger division of the tendon, passes straight onward to the other toes, supplying each with an additional tendon. It will be obvious to any one inspecting sketch E, that when this muscle (therein named flexor digitorum et pollicis) is put in action, it will necessarily draw the great toe and the other four toes together, and that simultaneously, towards the middle of the sole. This addition of a fourth set of flexor tendons for the four outer toes, and with it a distinct provision for the simultaneous action of those toes with the first, is very remarkable, and seems to complete the foot of the chimpanzee as a perfect instrument of prehension. The absence of the human flexor accessorius may be presumed to be an advantage, as it provides more space in the sole for the object grasped, and as no transversus pedis was found, the distal ends of the metatarsals are left more free to separate and enlarge the grasp. Next to the surface of the bones was beautifully seen the tendon of the peroneus longus muscle, resuming, in its bony and ligamentous groove to its destination, the base of the metatarsal bone of the great toe. When we consider, then, this elaborate mechanism, and see that the opening of the foot is most carefully provided for by the existence in connection with the four outer toes of a short and a long extensor for each, and by the presence of four distinct extensors for the great toe alone; and observe that flexion or prehension is made certain, exact, and powerful, by the arrangement of flexors for each of the four outer toes, vigorous short muscles of the great toe, and a necessarily synchronous action of the great toe and the other four, we cannot avoid the conclusion that we have examined the most admirable prehensile organ adapted to arboreal life that we can imagine; we must also feel persuaded that the hinder limb of the chimpanzee is still a foot, a prehensile foot of high perfection, surpassing even the hand itself in firmness and precision of grasp, but not a hand.

The additions to the ordinary mechanism of the human foot that have here been noticed, are not, so to speak, borrowed from the hand, but are either extensions of the plan of the foot, or new parts that occur neither in the hands nor in the foot of man.

The function of prehension by the foot, as is well known, is one enjoyed, not only by apes and monkeys, but by many other animals; the parrots, cockatoos, and other birds, and the chameleon, to cite familiar examples, have prehensile feet; it is attached to the nasal

organ in the tapirs and elephants, to the lips in the giraffes, horses, etc., and to the opposite or caudal end of the spine in certain monkeys and marsupials. Prehension, therefore, cannot be taken in the characteristic function of the hand of the higher animals.

*Digestive Organs.* The tongue, broad, fleshy, soft, and delicate, much resembled the tongue of a child. The milk-teeth, twenty in number, somewhat blackened, were all present. The total length of the alimentary canal was 15 feet 10 inches, or about six and a half times the length of the body. It is thus made up, viz.—

	Ft.	Ins.
From lip to pharynx - - -	0	3
„ pharynx to cardia - - -	0	6
Length of stomach along greater curve - -	1	8 $\frac{1}{2}$
„ duodenum - - -	0	6
„ jejunum and ilium - - -	10	0
„ caput cæcum coli - - -	0	2 $\frac{1}{4}$
„ appendix vermiformis - - -	0	4 $\frac{1}{4}$
„ colon, ascending, transverse, & descending	1	4 $\frac{3}{4}$
„ sigmoid curve - - -	0	7
„ rectum - - -	0	4
	15	10

Outlines of the stomach and cæcum accompany the paper. The œsophagus is somewhat narrow; the stomach is shorter and more globular than in man; the left end, or *cul de sac*, well defined; the pyloric extremity, funnel-shaped and abruptly bent back towards the cardia, which it nearly touches, is slightly marked off at the bend by a constriction, and there are two other smaller constrictions between this part and the duodenum. The drawing of the caput cæcum coli does not require particular notice. The peritoneum appears to be disposed very much on the human model, the foramen of Winslow, for instance, and the bag behind the stomach, were quite human.

The liver, with the gall-bladder, all the parts at the transverse fissure being cut close off, weighed 10 $\frac{1}{2}$  ozs. Its vessels and membranes resembled those of a child. It is divided into two great lobes, right and left, and each of these has a small rather detached lobule situated behind the transverse fissure, and bordering on the fissure of the vena cava. The spleen is rather thin, longish, and notched on its anterior border. The suprarenal glands are long and of a yellow colour, contrasting with the kidneys, which are brown, and also unlobulated.

*Skull and Brain.* The vault of the cranium having been removed, casts in plaster were at once taken by Mr. John Hancock of the inner surface of the bone of the brain covered by the dura mater, and, after

the brain was removed, of the cerebral surface of the base of the skull. Thus a correct cast of the whole cerebral surface was secured. Before the brain was in any way disturbed from its natural position, the relation of the posterior lobes of the cerebrum to the cerebellum was carefully observed; and the ten persons present, anatomists and naturalists, were unanimous in declaring that the former projected backwards over the latter a quarter of an inch. In the removal of the brain, the disposition of the membrane and nerves was observed to be strikingly similar to the corresponding human parts. The arterial circle of Willis was quite human. The entire encephalon with arachnoid and pia mater, vessels and nerves attached, and as much of the spinal cord as could well be reached by an ordinary scalpel, was carefully removed, and its weight was found to be 13 ozs. and 6 drachms, which is to the weight of the whole body nearly as 1 is to 19. The vessels having been removed, and the membranes, the whole brain was put at once into spirits for preservation and hardening, so that the separate weights of cerebrum and cerebellum were not taken. The three great lobes of each cerebral hemisphere were seen well developed; the two anterior lobes formed together a blunt projection forwards, whilst beneath their inner borders projected as ridges downwards, the under surface of these lobes were distinctly concave; the middle lobes were more prominent downwards than in man, and the projection of the posterior lobes backwards, overlapping the cerebellum, appeared as decided as before. After the brain had been for three days in spirits, the cerebral hemispheres measured in length  $4\frac{3}{8}$  ins., in breadth across the middle or widest part  $3\frac{1}{4}$  ins., the greatest width of the cerebellar hemispheres being  $2\frac{5}{8}$  ins.; so that the cerebellum is markedly overlapped laterally as well as posteriorly by the posterior lobes of the cerebrum. The convolutions of the cerebral hemispheres were numerous, somewhat intricate, and partially symmetrical, two main sulci, traceable one from the Sylvian fissure, the other from the base at the back of the crura cerebri, appeared to mark out even on the top of the hemispheres the division into anterior, middle, and posterior lobes, or masses of convolutions. The island of Reil in the fissure of Sylvius was quite evident with three small convolutions. The corpus callosum,  $1\frac{1}{2}$  in. in the length, showed as in man distinct though minute transverse striations, and a longitudinal raphe formed of two slightly raised lines and an intervening groove. A section of the right hemisphere, to expose the lateral ventricle, showed as bold and as numerous projections of the external sulci into the white centrum ovale as are commonly seen in

the human cerebrum. The ventricle itself was beautifully distinct, its anterior cornu curving boldly outwards in front of the striated body, its middle cornu winding outwards and downwards to the very bottom of the large middle lobe, and containing the hippocampus major and the corpus fimbriatus, and the choroid plexus and its posterior cornu extending in an ample curve backwards and inwards, so as almost to touch the grey matter of the surface next the median line, and having within it the projection called hippocampus minor, which may still be seen. On the floor of the body of the ventricle are to be seen the corpora striata, the tæniæ semicirculares and the free edge of the fornix with the choroid plexus; these last lie on the velum interpositum, which covers the third ventricle and the optic thalami, quite as in man. Further investigation in this direction was forborne, as it was thought desirable to preserve, for the present occasion, the parts already enumerated. The fourth ventricle, as it is called, and its walls, as they could be examined without injuring those parts, were inspected; the cavity was closed behind, and had its small choroid plexus after the human pattern; a second similar, but smaller, plexus existed on each side, just outside of the ventricle, and attached to the cerebellum. The point of the calamus scriptorius was well defined, but no white lines of origin of the auditory nerve were distinguished; on the other side of the medulla oblongata, the usual nerves were met with, and the pyramids and olivary bodies clearly to be seen, but they were not further examined. The cerebellum was laminated, and had the great human divisions; on examining that part which overhangs the medulla oblongata, the inferior vermiform process, the uvula and tonsils, the flocculus, and other parts enumerated in human anatomy, could, without difficulty, be dissected out; the superior vermiform process, also, was evident on raising up carefully the posterior lobes of the brain.

The conclusions arrived at in this short and imperfect investigation are, it will easily be seen, those which have already and for some time past been made public by Professor Huxley, viz.: 1, that the chimpanzee is not, properly speaking, quadrumanous, but that it possesses four prehensile extremities, two hands, namely, and two feet; and 2, that the brain of the chimpanzee differs from the brain of the man only in size and weight, therefore in the smaller size and extent of its cerebral convolutions; the same parts, without exception, exist in both brains. Whether the cerebral matter of the ape differs from that of man in microscopic characters, or how otherwise it may differ, are problems yet to be worked out.

*On the syndactylous condition of the hand in man and the anthropoid apes.* By C. CARTER BLAKE, F.G.S., F.A.S.L. (D).—I have now the honour to call the attention of the Section to a curious abnormality which is presented by the integument of a specimen of old male gorilla which was brought from the Gaboon by Mr. W. Winwood Reade, and presented by that gentleman to the Museum of the Anthropological Society of London. The specimens of Gorilla which have been the subjects of the elaborate and complete memoirs which have appeared from the pen of MM. Duvernoy and Isidore Geoffroy St. Hilaire, in the Archives of the Paris Museum (vols. viii and x), and by Professor Owen in various parts of the *Zoological Transactions*, have, with those described by other authors, all coincided in one attributed character, true as regards the specimens with which they were acquainted, which probably represent the majority of specimens of gorilla which had been examined in Europe. This statement, reduced to a general proposition, was that the integument of the skin of the fingers was more or less connected across the first digital phalanx, in such a manner that the first joints were firmly connected together by skin, sometimes as far as the distal extremity of the first phalanx, sometimes merely to the middle of this phalanx. In no specimen of gorilla, of the description of which I am yet cognisant, are the digits of the anterior extremity free to the same extent as in man, in which the distal extremities of the metacarpals mark the termination of the amount of syndactyly of the hand. In the specimen of gorilla to which allusion is made in this short note, the digits of the fingers present a different condition of connection than in the typical specimens described by zoologists. The second (index), third (medius), and fourth (annulus) digits are free beyond the distal end of the metacarpals as in the human subject; the fifth digit (minimus) is also in a less degree attached to the annulus than in the specimens of gorilla contained in various public museums. We have thus a specimen of gorilla in which the digits of the hand are almost as free as in the hand of the lower races of mankind. Careful examination by a lens, of the integument, before the preparation of the specimen by Mr. Leadbeater, who first called my attention to this abnormality, demonstrates the fact that the epidermis covers the cutis on the inner sides of the interdigital spaces of the first phalanges of this specimen. The consistency of this epidermis merely differs in degree from that of the homologous structure in the foot, and in other parts of the body. It would be interesting to compare such a curious abnormality of the integument with the similar abnormalities which exist in the human

species. The human fingers are most frequently connected together by syndactyly, and remain during life in that state of arrested development (as regards the integument) which is typified by the permanent stage of development of the gorilla. On the other hand, I have never yet met, either in the chimpanzee or oran-útan, with a similar case of freedom of digits to that here described. We must, however, recollect that the number of specimens of chimpanzee and oran-utan, which have been accurately described anatomically, form a very small percentage. How many individuals of gorilla may exist, in which a similar "accidental" variety may exist, must remain for a long time unknown to us. Syndactyly is often congenital. A case has recently come before my observation of a married female, in which the *medius* and *annulus* of both hands are firmly connected together by integument. A similar condition prevails in one of her children; another has the deformity on the right hand; whilst the youngest preserves the digits in their normal condition. The speculation whether a like rule or its converse may or may not prevail in the ape; whether it might not through generations during which the congenital defect of the gorilla, or absence of the characteristic syndactyly, might be transmitted, operate towards the production of a more prehensile form of hand, must, however, be postponed until a vaster series of specimens shall be examined by anthropologists or zoologists.

*On the ligamentous action of the long muscles in man and other animals.* By Dr. CLELAND (Da.)—The author pointed out that, in the human subject, maximum flexion of the hip-joint could not be obtained along with full extension of the knee, on account of the shortness of the hamstring muscles; and so also maximum flexion of the ankle-joint, along with full extension of the knee, was prevented by the shortness of the gastrocnemius muscle. This limitation of movements by the shortness of muscles, he said was best seen in the humeral region of the horse, where it was so great that very little flexion or extension of the shoulder could occur without a corresponding movement at the elbow; well-marked instances of similar interdependence of joints were to be found in other parts of the horse, and also in other animals—*e.g.*, in the legs and wings of birds. He proceeded to show that movements of that description compelled in the humeral region of the horse were exactly those most frequently and usefully employed by human beings; that the shoulder and elbow were usually flexed and extended together; that likewise in walking, leaping, &c., flexion and extension of the hip, knee, and

ankle went together; that in those movements the long muscles were not alternately contracted and extended, but kept in a state of medium contraction, very slightly altering their length, and were, therefore, evidently not the muscles which produced those movements. On the other hand, it was shown that a muscle passing over two joints, if maintaining a definite length, would cause another muscle passing over only one of them to act upon both. It was argued, that in the movements referred to, the long muscles gave force, but not velocity.

*Notes upon the opening of a Cist of the Stone Age, on the Coast of the Moray Frith.* By GEORGE E. ROBERTS, F.A.S.L., and Professor BUSK, F.R.S.—Mr. Roberts says that, in company with his friends Dr. Gordon and Mr. Harvey Gem, he had lately visited two mounds situated upon the sandy shores at Bannat Hill, a mile from Burghead; and after examining their contents, they turned their attention to the small cairns of rudely piled stones which lie a few yards from one of the shell middens, and which evidently marked the burial places of the tribe. Two of these were piled around small enclosed spaces, formed by the junction of four upright stones. A fragment of human jaw lying on the sand outside one of those led them to search among its contents for other bones, but unsuccessfully. The second cairn, however, with its central cist, yielded better evidence. This, like the neighbouring tomb, was a rude erection of four flat sandstone slabs, placed vertically, so as to enclose a space 30 inches long by 20 inches in width. The depth of the stone, which nearly corresponded with that of the grave, was 22 inches. Three of the stones had been slightly smoothed before use. The direction of this grave was S.S.E. by N.N.W. This, however, was of no moment, as the adjoining one differed so much in this respect as to lie at nearly right angles to it. The cavity thus formed was filled with sand, into which they dug, and presently succeeded in discovering a skeleton, which had apparently been buried in a crouching position, the legs below the knee being bent beneath the hams, and the head bowed towards the knees, *brachycephalic*, and presenting other peculiarities, which Mr. Busk had described in a note attached to the paper. From the position of the skeleton he was at first inclined to consider that the cist had never been broken into, but the absence of some few of the vertebræ and of the smaller bones, rendered this somewhat uncertain, though the disturbance, whether from curiosity or another motive, seemed to have been insignificant. He regretted, however, to add, that the box in which he

packed the bones was tampered with during its transit from Elgin to London, and some of the bones, including the lower jaw, from which precious evidence might have been obtained bearing on the *Moulin Quignon enigma*, never reached him. He had made inquiries about the matter since, but fruitlessly. No pottery or fashioned stones accompanied the skeleton.

The note by Professor Busk was to the effect that the bones had belonged apparently to a young individual about five feet eight or nine inches in height, of slight make, and no great muscular development. At first sight, from the comparative delicacy of form and want of muscular impressions, one would be inclined to regard them as those of a woman, but if so she must have been of more than the usual stature. Unfortunately no part of the pelvis, which would enable a correct judgment as to this point to be formed, was found among the remains. If the owner was a man he must have been a small size, and not of a strong build, with a remarkably small head for a male. The cranium was decidedly brachycephalic, the proportions of length to breadth being as 1.00 to .823, and for its size rather unusually high, the proportion of that dimension being to the length as .808 to 1.00. The forehead was narrow, and the superorbital ridges very slightly projecting, although the frontal sinuses were well developed. Compared with other ancient crania this might be regarded as belonging to the same class as those which had been considered as appertaining to the stone period of the North of Europe.

Mr. CARTER BLAKE said that although the shortheaded proportions of the skull reminded us of the skulls of the stone period of Denmark, or of the skull which had been discovered at Kellet, in Lancashire; although the manner in which the body was entombed, with the corpse in a crouching posture, are to a certain extent in accordance with similar conditions in such ancient remains, as, *e.g.*, those from Aurignac, in the south of France; yet the undoubted association of the skeleton with bronze remains, precluded our conception of such an extreme antiquity as that which would be coeval with the formation of the shell mounds of Denmark. More recent evidences, however, acquired by Mr. Lubbock, have rewarded that inquirer, by undoubted bronze remains from kjoekkenmøddings in Scotland, and the important facts which Mr. Roberts and Professor Busk had laid before the Section, have for the first time given us reliable evidence respecting the physical characters of these old prehistoric inhabitants of Scotland. Although the harsher features which characterized the skulls of the Danish stone period are softened, yet there is just so much family likeness as to lead us to the conclusion that one and the same general type of man inhabited Northern Europe, in Denmark, before the Baltic had so changed its beds, as to be no longer capable of

supporting those especially marine mollusca, which have passed away since the advent of our hunting and fishing population on its shores.

J. CRAWFURD, Esq., F.R.S., *On the Commixture of the Races of Man as affecting the Progress of Civilization*.—It was not until the discovery of a new world that races of man of strikingly contrasted qualities came to intermix. In the western world, the intermixture of nations which followed the conquests—first of the Romans, and afterwards of the northern nations—was an union of races of equal quality; and hence it cannot be predicated that either improvement or deterioration was the result. Very different was the case in the eastern world. There Greeks, Romans, and Goths intermingled with races greatly inferior to themselves—such as Egyptians and Syrians—and hence the deterioration to which, in a great measure, must be ascribed that decline in civilization which ended in the downfall of the Roman power. Nature has endowed the various races of man with widely different qualities, bodily and mental, much in the same way as it has done with several closely allied species of the lower animals. When the qualities of different races of man are equal, no detriment results from their union. The mongrel French and English are equal to the pure breeds of Germany and Scandinavia. When, on the other hand, they are unequal, deterioration of the higher race is the inevitable result. When the disparity of races is extreme, no amalgamation at all takes place, for an antipathy is the result, somewhat similar to that which prevents admixture between closely allied species of the lower animals in the wild state. The Hottentots, the Caffres, and the Negroes of Southern Africa have lived immemorially side by side without crossing. The author then remarked that the antipathy of race is presented in the greatest intensity and on the largest scale in the new world, the highest and lowest types of man being there brought face to face. The author then alluded to the laws of several of the American states with regard to Negroes, and stated his opinion that it is the presence of this African race, too prone to live and labour in slavery or in social degradation, and utterly incapable of rising to an equality with the higher race among whom it has been planted, that has caused the present distracted state of the North-American continent.

Mr. CRAWFURD'S Second Paper commenced with the *Mongolian Race*. As the race seems one throughout, although, by alternations of invasions and conquests, no doubt considerable intermixture must have taken place, no appreciable difference, whether in physical form or intellectual capacity, has followed. Towards the western frontier, however, there seems to have been some commixture with the Hindus,

as in the example of Assam; and, towards the Eastern, with the Chinese, as in the case of the people of Anam. The Indo-Chinese have, however, commingled with the Chinese in certain localities. The admixture, in these instances, is of comparatively modern date, not reaching further back than the first intimate knowledge of the nations of the far East by Europeans. It has arisen from Chinese emigration, originating in the pressure of population on subsistence. As is well known, Chinese emigration is, with very trifling exceptions, confined to adult males, and these always of the working classes, without leaders or capitalists. The immigrants get or purchase wives in the countries in which they settle, and the result is a mixed race, always educated as the fathers,—in energy and industry below the Chinese, but far above the Indo-Chinese. Fresh immigrants find wives among these half-castes; and in due time a population springs up little distinguished from the pure Chinese, except in the possession of a better acquaintance with the country and people they are planted among than the original immigrants. To the industry and skill of these colonists, for such they virtually are, are owing nearly all the staple productions of the countries in which they are settled ministering to foreign commerce. Within the vast bounds of China, the race of man, whether situated eight degrees within the tropic, or twice that distance beyond it, seems one and the same. What is true of China is equally so of Japan, over the whole of which one peculiar race would seem to extend, the exceptions being trifling, and consisting only of the aboriginal races inhabiting the island of Jesso and the Kurile Islands, with neither of which despised races do the Japanese appear to commix. The Japanese received letters and religion from China, but no evidence exists of a colonization of Chinese in Japan; and the wide difference, in manners, language, and institutions, which exists between the two races, would seem to indicate that no considerable intermixture ever took place. Indeed, from all we know of the history of the Japanese, an intimate connexion with the Chinese has ever been repugnant to them. I proceed next to take a glance at the commixture of races which has taken place within the vast insular region which French geographers have of late designated the Oceanic, as forming a fifth division of the globe. This great portion of the globe extends north and south from Formosa to New Zealand, and from west to east from Sumatra to within two thousand miles of the American continent. The most prominent aboriginal races existing in the vast region in question, are the Malay; the pigmy Negro of the Malay Peninsula and Philippines; the stalwart Negro, such as the

people of New Guinea, New Caledonia, and the Fijis; the tall brown-complexioned people, or Polynesians, of whom the Tahitians, Hawaiians, and Maories are examples; and finally the Australians. All these differ so completely in physical form, and there can be no doubt of their being different races of men. The strangers that have intermixed with the aborigines consist of Hindus, Arabs, and Europeans of the north and south of Europe. Among the native races there has been little commixture, and, with partial exceptions, none to the extent of forming a permanent cross-breed. Between the pigmy Negroes and the Malayans, although dwelling in the same countries, sexual unions seem no more to take place than between closely allied species of the lower animals in the state of nature. It is stated, however, that between the tall Negroes of New Guinea, with its adjacent islands, and the Malayan settlers on their coast, a cross-breed has sprung up. The people of the Fiji group afford an example of a cross between the tall Negro and the Polynesian, a fact to which the personal appearance of the people, and their mixed language, bear testimony. When, within the Oceanic region, the race is found to be one and the same, a difference of language as a test of race must, as in other parts of the world, go for nothing. Thus the Malays, the Javanese, some half-dozen nations of Sumatra, a dozen of Celebes, and perhaps a hundred of Borneo, speak essentially different tongues, yet are of one and the same race, or at least differ no more from each other than do Europeans, African Negroes, Hindus, native Americans, or Chinese. The earliest strangers who mixed their blood with the people of the Oceanic region were the Hindus, and, as might be looked for, it was confined to the race nearest to their own country, the Malayan, never having reached the rude and remote Polynesians and Australians, a fact sufficiently proved by the total absence in all their tongues of any trace of a Hindu language. The number of the Hindu settlers compared with the indigenous people must in the nature of things have been small, and it follows that it has left no trace of the peculiar characteristics of the Hindu physical form. The only evidence of the intercourse consists in language and relics of Hindu religion and customs, with Hindu architectural monuments. These, however, are abundant, especially in Java and Sumatra, the nearest countries to Hindustan, and also the most attractive to the emigrant, from their extent, their fertility, and most probably also from their superior indigenous civilizations. Among European nations, the Portuguese and Spaniards, the latter more especially, are the only people who have intermixed to any considerable extent with the Malayan

race, and none have done so to any appreciable degree with any of the other Oceanic races. In Malacca and Timor, the only portion of the Malay Archipelago long held by the Portuguese, a cross-race has sprung up with so much of Malay blood as to be hardly distinguishable from the Malays themselves. In the Philippines a far more considerable population has arisen from the union of the Spaniards with the natives, known, as is the cross of the Red Man with the Spaniard, by the name of Mestizoes, or hybrids. We possess one unique example of a hybrid race from the union of the European with the brown Polynesian, and have the blood of the two parties of equal amount. This is the case of the mutineers of the *Bounty*, who settled in the little unoccupied island of Pitcairn in 1790. In 1793 the colony consisted of the following parties:—nine Englishmen, thirteen Tahitian women, and six Tahitian men, making a total of twenty-eight persons. In 1814 they had increased to forty-eight; in 1831, to eighty-seven; in 1853 to one hundred and seventy; and in 1862, removed to Norfolk Island, Pitcairn being found too small to maintain them, they had risen to the number of two hundred and sixty-eight, so that in seventy years time the population had multiplied full nine-fold. The Tahitian men left no offspring, and as neither European nor Polynesian has from the first joined them, they may be described as pure Mestizoes, or half-castes. When seen in 1814, a few of the members of this peculiar colony were of the dark complexion of the first mothers, but the majority, following the physical characters of the fathers, were not to be distinguished from the inhabitants of an ordinary English village. As at present settled in Norfolk Island, they are found to be wanting in the energy and enterprise of their paternal forefathers. A noticeable fact connected with this little community is the rapid increase of population, and this without any addition by immigration. It is a contrast to the stationary or retrograde state of population in the other islands of the Pacific. The difference, no doubt, has arisen from superiority of race and civilization; and although the last of these had no higher source than a midshipman and eight English sailors, it was sufficient to generate intelligence and industry, and to exempt the colonists from the social vices which elsewhere hinder the advance of population.

Professor WILSON said that he had devoted a great deal of time to the question of the mixture of races on the North American Continent. In the case of the Negro the subject was surrounded by so many social difficulties that so far as important ethnological results were concerned, it could scarcely be said to have had a fair trial. Not so, however, in the case of the red man. There was no legal impediment to marriage between a Red Indian and a white man;

some of the latter even boasted of their Indian descent. The colonists who went from this country to the North American Continent in the early years of settlement were generally young, unmarried men, who united themselves, either with or without marriage, to Indian women. In process of time there arose a vast population possessing English and Indian blood in their veins—such, for instance, as was found on the Red River settlement. These people possessed physical qualities of a high order—were persevering in the chase, and valiant in fight with their enemies. They were, however, to some extent, civilised, being chiefly Roman Catholics in religion, and no longer using the scalping knife upon their vanquished foes. When introduced into the society of Anglo-Saxons they frequently manifested very superior intelligence and ability, indicating no degree of inferiority whatever as compared with what was usually called the superior race. One of these persons had been under his (Professor Wilson's) instructions at University College, had taken his B.A. degree with honours in classics, and afterwards visited England as an agent of the Red River Settlements. Assuming that the Red Indian was an inferior race, and the Anglo-Saxon one of the highest types of man, the instance he had given would go to prove that the mixture of inferior and superior races did not cause either one or the other to deteriorate. The problem could not be tried to the extent to which it was desirable to carry it, as the white men had arrived in America in such vast numbers as to drive the aborigines before them; but it did not follow that the Red Indian disappeared because he was the inferior race. The Red River settlement was an illustration of the amalgamation of the two races without such deterioration, and he (Professor Wilson) believed that there was a much larger admixture of Indian blood in the white population of the American Continent than was generally supposed; and that this accounted for some of the peculiarities of the American, as contrasted with the European character. He believed that a mixture might take place between the white and the red race, with benefit to both. He thought that the same doctrine would apply with respect to the Negro and white man, though in that case there had not been so fair a trial as in the case of the Indian.

Mr. CRAFT said that being of African extraction, he felt called upon to make a few remarks upon the subject under discussion. He did not quite understand whether the author of the essay to which they had listened intended to say that no amalgamation had taken place between the Negro and the Anglo-Saxon race in the United States. He thought that Mr. Crawford had intimated that there was a very strong antipathy between the two races, and that the laws of the Southern States prohibited intermarriage between the Negro and the whites. He submitted that in spite of those laws there was a large population claiming affinity with both races. He thought he should be right in saying that nearly two-thirds of the Negroes in the Northern states of America had more or less of European blood in them, and he also believed that had it not been for that amalgamation, instead of there being 4,000,000 of slaves in those states there

probably would not have been more than 1,000,000. He would simply state, on behalf of the African race, that whenever they had had equal opportunities with the whites they had shown that they possessed considerable intellectual ability, and many of them had risen to very high position in society. He mentioned that, in order that persons who were not acquainted with Africans might understand that there was just as much difference between individual Africans as between individual Englishmen. He found that all Englishmen were not Shakespeares. He did not admit that Kaffirs were fair specimens of the Negro race.

Dr. JAMES HUNT agreed with the author of the essay in the general conclusions at which he had arrived, but he thought he had not dwelt sufficiently on the great physiological law which was admitted by most observers, that where the intermixture was kept up through succeeding generations the offspring gradually died out, and the race became extinct. He thought that the laws in the Southern states of America against the intermarriage of the negroes and the whites were wise laws, but he admitted that the subject was surrounded by considerable difficulties.

Mr. MARKHAM cited some instances from the Continent of South America, to prove that intermarriages between European and native American tribes tended to improve the intellectual and physical character of the population.

The discussion was continued by Professor Wilson, Mr. Carter Blake, Mr. Ralph Carr, and Mr. Craft.

*Troops in India.* By Dr. CAMPS (H.)—An analysis was given of the recent report on the sanitary state of our army in India. The conclusions drawn were:—1. That by far the larger proportion of the mortality and inefficiency in the Indian army has arisen from endemic diseases, and notably from fevers, diarrhœa, dysentery, cholera, and from diseases of the liver. 2. That the predisposition to these diseases is in part attributable to malaria, in conjunction with extremes of temperature, moisture, and variability. 3. But that there are other causes of a very active kind in India connected with stations, barracks, hospitals, and the habits of the men, of the same nature as those which are known in colder climates to occasion attacks of the very diseases from which the Indian army suffers so severely.

Dr. JAMES BIRD said that Dr. Camps's paper seemed to be an abstract of the Sanitary Commissioners' Report, which he contended—by leaving out the ratio between peace and war—was not correct in its statistics. The returns were mixed returns: it was absolutely necessary, in order to obtain a correct result, that the peace and war returns should be separated. He had no fear of the climate, if the sanitary measures necessary were carried out. Dr. Edward Balfour said, in 1849, that he differed entirely from Col. Sykes's conclusion, that intemperance and vice were the main causes of disease; and he

(Dr. Bird) differed from them also. The causes of the excessive mortality were heat, moisture, and localities. The Station Reports showed that; although vice and intemperance had their effect. The colonel seemed to think that the rate of mortality in India was 67·9. He had shown that in the last twenty-six years it had scarcely exceeded 44, and in the last five years it had not exceeded 35. He dissented from the colonel's opinion as to the excellence of the barracks. The great mortality was increased by ill-ventilated barracks, and the filthy cess-pools in the midst of them. He believed the proper remedial measures applied to them would cause life to be preserved in India as well as in any other country. He held that the respiratory functions of the human body could be acclimatized to a warm region; but it was impossible to acclimatize any human body to miasmata; and he fully believed that, in order to lessen the mortality of the troops in India, it would be necessary to lay a good foundation for the barracks, and attend to their arrangements as carefully as those of workhouses and hospitals in this country were made.

Dr. JAMES HUNT entirely disagreed with Dr. Bird on the subject of acclimatization. There was a physiological change produced; but it was not acclimatization, but the gradual production of disease. With regard to the fact of the mortality being chiefly put down to intemperance and immorality, he must say he could find no evidence of that. It was certain that in such climates as that of India, it was necessary for European inhabitants to take stimulants; the defence of teetotalism for India was objectionable. He held that there should be a judicious selection of men suited to hot climates; they could not preserve every one in health there. As for attempting to rear the children of European parents, the system was utterly false. Throughout the whole of Bengal, there was not the third generation of Europeans; the mortality among children was excessive, and, in fact, it was utterly impossible to rear children. His conclusion was, that the only way to cause a decrease of mortality among the troops, would be the selection of men suitable for the climate. By a study of temperaments and other peculiarities, it was possible to predict with a degree of certainty, which he found most surprising, what would be the influence of climate on different temperaments.

Colonel SYKES defended the Commission from the statements of Dr. Bird. For their reports they had the authority of a very great number of witnesses, and there could be no impeachment of the integrity of its members. Where great heat and moisture existed, disease prevailed; but he found that where great heat prevailed along with dryness, it was not detrimental to the health of the men. The great evil of the whole system, was the employment of European troops in such numbers without real necessity, thus causing an enormous amount of misery amongst the families of the labouring poor in England. That was what most of all he deplored. A very great deal of expense had been incurred in barrack accommodation; and he was still of opinion that vice and intemperance were fruitful sources of disease. After considering what we had lost, the question for them was, what were we likely to lose in the future? At all events, we

should preserve our power in India with the very smallest possible number of English troops; and he should even be inclined for us to run some risk for the sake of humanity, and for the preservation of the youthful blood and sinew of the country.

Dr. HANCOCK was of opinion that vice was a great source of the disease in India, but that was created in a great measure by the restrictions on marriage. The climate was not the cause. The arbitrary restrictions on the marriage of the men deprived them alike of friends and family, and they were driven to the vices which ultimately brought them to the hospitals.

Colonel BAKER thought that the conclusion drawn from the papers before them, that the average 67·9 per thousand was the true average of the mortality of troops in India, was erroneous. He maintained that the sanitary measures of the Government in India had been very effective, and had reduced the average mortality in time of peace.

*Instinctive Actions.* Dr. WM. MURRAY (D a) endeavoured to demonstrate the part which each of the sources of nervous power plays in generating those effects, which, in the aggregate, make up an instinctive act or set of actions. The author thought that the instinctive movements of animals, and their nerves or physical construction, do not differ from those of man in kind, but in degree. In man the volitional, as representing reason, abstract deduction, and experience, is immensely superior to the others. As we descend in the social scale, we find the emotional, as the originator of the purely and really instinctive movements, become more prominent, and generally carrying the will with it, for we very seldom see an animal going contrary to his instincts. Lower still in the scale, we find all the arts necessary to the life of the animal left to the care and control of reflex action. Was there, then, he asked, in animals an intelligence? And his reply was—We strongly incline to the belief that there is, and that it varies in its power with the kind of animal, and manifests its existence by the extent to which it controls the emotional or purely instinctive part of his actions.

Dr. B. W. RICHARDSON rejoiced that the time had come when the convictions of men of science could be freely expressed, and when they dared to assert that there was nothing in man that might not be understood. Physiologists ought not to admit that there was any hidden vital force or mysterious entity in man which could not be comprehended or explained. For his own part, he would go still further than Dr. Murray had gone, and assert every influence upon man to be from without. Men were moved and controlled by the eternal universe alone; and a Shakespeare himself, in grandest poetic effort, was but giving up through his hands that which he had received and concentrated from the universe around him.

*On Life in the Atmosphere.* By JAMES SAMUELSON, Esq. (D a.)—

No subject in natural history, he remarked, except the allied one, the origin of species, had of late excited greater interest in the scientific world than the origin of the lowest types of living beings on the globe; and although the problem was far from being solved, yet, the investigations that had accompanied the discussion had already served the useful purpose of throwing new light on the anatomy and life history of the mysterious little forms of which it treated. It was rather with the latter object, than in the expectation of being able to assist in the solution of the general question, that he ventured to lay before the association the results of investigations recently made. He had, for example, taken rags imported from various countries, and shaken the dust from them into distilled water, which he then exposed to the atmosphere; and, after describing generally the character of the living forms he had discovered in this pure water, he stated in detail the forms of life found in each kind of dust, and among these were some new species of rhizopoda and infusoria, and an interesting ciliated worm-shaped form, which he believed to be a collection of the larvæ of some other infusoria. The general results of the microscopical examination of these fluids between the 27th of July and 15 of August was as follows:—in the dust of Egypt, Japan, Melbourne, and Trieste, life was the most abundant, and the development of the different forms was rapid. In conclusion, he observed that if he was correct in supposing the germs of the living forms that he had described to be present in the dust conveyed by the atmosphere, and in distilled water, it was worthy of notice that these germs retain vitality for a long period, one of which he could not pretend to define the limit. In his experience they outlived the heat of a tropical sun, and the dryness of a warm room during the whole winter; but in Dr. Pouchet's case they retained their life 2,000 years, for he obtained his from the interior of the pyramids of Egypt, and then survived an oil of 400 degrees of heat. Mr. Samuelson endeavoured to disprove the theory of spontaneous generation. He suggested whether the great rapidity with which these germs are multiplied might not account for the spread of epidemic diseases. He did not profess to have any acquaintance with such diseases; but might it not be desirable to subject the atmosphere of hospitals to the microscopic test?

Dr. ROLLESTON attempted to ridicule the notion of spontaneous generation which certain French writers had propounded and endeavoured to defend.

Dr. B. W. RICHARDSON believed it might yet be discovered that

certain diseases of an epidemic nature were produced by the infusoria of the atmosphere as suggested by Mr. Samuelson, and thought that the best way of arriving at some conclusion upon the subject would be by first removing all those diseases which all agreed could not possibly be so engendered, and testing the remainder. There would not be much difficulty in this, because all our known diseases did not exceed 279; and of these there were not more than ten or twelve not already accounted for. Many facts had been related confirmatory of the opinion that epidemic diseases were sometimes produced by inhaling dust filled with living creatures. On one occasion, for instance, three men were thrashing in a barn. In turning over a truss of straw some dust rose in their faces, and caused a slight irritation in the nose and throat. They thought nothing of it, however, but presently one of them said he felt cold, then another, and then the third; then one felt sick, and in the course of an hour they were all unwell, and on the following day all three were seized with erysipelas. Dr. Sailsby had recently made several experiments of this order. Some men were handling a tree covered with a fungus, when they were seized with symptoms resembling measles. The doctor first inoculated himself and then his children with the virus, and like results followed; they had the measles, or something very similar. The same facts had been observed by Dr. M'Donald, who had learnt of a case in which measles were produced in a boy by some slightly decomposed linseed meal having been thrown in his face. He strongly advised that the subject should be duly investigated.

*Influence of high altitudes on man.* (A.)—Mr. GLAISHER gave some account of the curious changes in colour that he and Mr. Coxwell experienced in ascending, and remarked that they could now go a mile higher without turning quite so blue as before.

Professor OWEN said he had attended the section chiefly in the hope of hearing from Mr. Glaisher something of the influences of these very high distances on the human frame, which was adapted, of course, to a very different medium. The fact which Mr. Glaisher mentioned as to his feeling a greater power of resisting the influence of very high temperatures was very interesting in physiology, and in relation to the series of facts with which they were acquainted. They knew their lungs did adapt themselves to atmospheres of different degrees of gravity, so that there were people who lived habitually on high mountains and felt no difficulty in breathing such as was felt at once when the inhabitant of a plain or low country came up to these elevations. Now, that depended upon the greater proportion of the minute cells of the lungs which are open and receive an attenuated atmosphere, in proportion to the minute cells that are occupied by a quantity of mucus. Those on the plain did not make so large a use of their breathing apparatus as those who lived at great altitudes. Hence more cells, occupied by mucus, would be taken up, and opened to free course and play; and he had no doubt that was the solution of the interesting fact mentioned by Mr. Glaisher. Physiolo-

gists were all agreed that one condition of longevity was the capacity of the chest, and therefore he hoped the increased breathing capacity acquired by Messrs. Glaisher and Coxwell would tend to the prolongation of their lives.

Mr. GLAISHER, alluding to what had fallen from Professor Owen, remarked that the adaptation of nature was certainly something wonderful. He had been in a position, anxious to remain, and though not a second was allowed him, he looked down, around, above, everywhere in a momentary glance, and everything became fixed on the retina with such ten-fold impressions that there were many of these scenes he could call to mind now, and could (if he were able to draw) reproduce them on paper. One sensation he found was that his arms were forced back and more air was taken into the chest. The eyes were clear, the brain active, and the powers increased according to the exigencies of the case.

*On the aboriginal occupations of North Tynedale and Western Northumberland—an illustration of the social life of the Celts.* By Rev. G. R. HALL. The present brief account embodies the results of recent researches connected with the aboriginal settlements of the western parts of Northumberland. The subject is one of more than local interest, as the ancient remains are concluded, with good reason, to be those of the earliest race of men who inhabited these islands, of whose social condition any trustworthy vestiges remain.

These dalesmen and mountaineers of a prehistoric Northumbria gave those names to hills and streams which are still current in the county. Its chief river—the Tyne—was so called long before the vanguard of the victorious Roman legions set foot upon its northern bank, or built the walls of Pons Ælfi, on whose site this important town of Newcastle now stands. The name of the Tyne is usually derived from the ancient British word *tyn*, that is, the *double* river, in allusion to the two branches called the North and South Tyne, which form it.

The former branch, the North Tyne, is the larger of the two, both as to volume, and the distances from its sources in the recesses of the Cheviot range of mountains to its confluence with the sister-stream of the South Tyne. North Tynedale is about forty miles in length; and the area embraced in this notice of it, including the districts drained by its tributaries, is over three hundred square miles.

A few notes on the aboriginal occupation of North Tynedale, derived from personal research during the past and the present year, may not be devoid of interest in connection with the Geographical and Ethnological sections of the British Association.

Two kinds of ancient British caerau, or fortified towns, may be

named the hill forts and the lowland fastnesses. They are located in the strongest positions, on the top of lofty upland ridges, crags, or rounded heights, in the case of the former; and the latter occupy advantageous sites on escarpments and platforms of the lower grounds, generally flanked by deep ravines and the precipitous banks of the numerous mountain streams in the river basin itself. In one instance, the middle of an inaccessible morass or bog has been chosen near the basalt cliffs at Sewingshields; and at Bridge House, near Wark, another singular site has been selected in the hollow or sinus, shut in on every side, the remains of which are still called the "Campsteads," as the oppida, or towns themselves, are commonly termed "camps" by the dalesmen; perhaps from having been used as encampments in the mediæval border forays and conflicts.

One of the finest examples of the hill-fastness of the aboriginal Britons of this district is found on Warden Hill, overlooking the junction of the South with the North Tyne. Its height above the sea, about 600 feet, gives no inadequate idea of the extensive view obtained from this spot, and of its consequent importance as a post of observation. It commands a prospect of many miles of each of the three valleys to the north, west, and east, as they spread out beneath the eye of the spectator like radii from a common centre. The ancient town of Hexham is in the lower foreground. A broad expanse of the undulating uplands on every side can be discerned. No neighbouring eminence commands it. All around the ground slopes gently or abruptly from the apex of the hill on which the fort was built. Its area, including the three concentric ramparts by which it has been defended, is about two acres. Within these outer defences some of the aboriginal dwellings or house-circles may be traced. On the opposite bank of the North Tyne, south of the line of Hadrian's vallum, stands another fortress, built—like most of the settlements which I have noticed in the district—of massive unhewn blocks of the native freestone. If we follow the upland "wastes," the "vastæ" west of the river, which Camden tells us were inhabited in his time, as they were no doubt in the pre-historic period, by a race of nomades, half shepherds and half soldiers, "*militare genus hominum*," a few noteworthy forts can be seen, besides two or three situated to the south of the Roman Wall, the principal of which was the strong hill-fastness of Barcombe. At Sewingshields, Lonbrough, the Catlass Ridge, and Roses Bower or Wark's Burn, at Bridge House, the Stone Folds, and Leek Hill, and Hindridge, we meet with these primitive fortifications; vestiges of whose Cyclopean walls, less or

more perfect, still remain. On the eastern bank of the river, North Tyne, and the banks of the Rede, several of these hill-fastnesses exist; as Errington Hill Head and High Shield Green "Night Folds," wherein, as we may suppose, from this traditional name, the aboriginal herdsmen, like those of Casivellaunus, when threatened by the advance of Cæsar's hostile legions, were wont to secure their flocks and cattle, brought in from these upland pasture grounds (which are still noted in these parts as an excellent "summer feed") and thus protected them from the ravages of wolves and night robbers. A chain of these fortresses again, crown the elevated ridge near Otterburn, one of which was occupied by the Scots in 1538 before the famous battle of Chevy Chase, between Douglas and Percy, was fought.

We may now turn to what I have called the lowland fastnesses of the aboriginal Britons, that is, the towns whose sites are on the declivities of the valley itself.

In former times the margins of the rivers North Tyne and Rede were clothed with abundant vegetation, and many picturesque remains of the primeval woods continue to adorn these valleys in the neighbourhood of Keilder Castle, Heselyside, and Redesmouth. In clearings of the forests the aboriginal inhabitants appear to have had numerous settlements in this district. Near Keilder some very perfect examples may be noticed, where eleven of these towns existed. Amongst these the double fort, popularly known as "Bran's Walls" (a name which calls to the mind the famous Celtic chieftain of later days, Bran Galed, or Bran the Hardy) is worthy of inspection. This stronghold occupies the slope of a hill overlooking the sources of the Keilder river, and is situated in the midst of a vast amphitheatre compassed by wild heather-clad mountains, of which Pell Fell, 1,290 feet above the sea level, is the highest. The shape is that of two irregular ellipses, closely connected with projecting works, covering together about an acre of ground. Eleven hut-circles, or dwellings, can be plainly traced within, their average diameter being about twenty-four feet. The Bell's Hunkin fort, in the North Tyne Valley, about one mile west from Keilder Castle, is also in excellent preservation. It occupies a strong defensive position on the brow of a deep ravine, the site being covered with a natural growth of the birch and alder, and mountain ash. A vallum, constructed of large stones, surrounds it, but there is no fosse. The vallum rises in some places to the height of seven feet, and within it I noticed five circular foundations of primitive dwellings, measuring five, six, seven, ten, and eleven paces

across, respectively. This stronghold is erroneously spoken of by the dalesmen as a Druidical circle or temple, of which none now exist in the valley, though Wallis mentions one as having stood near Nunwick, and tradition points to another, where a solitary pillar of basalt stands near the village of Barrasford, to which a wild legend, like the Breton folklore, representing the "Palet de Gargantua," or Gargantua's quoit, is attached. A group of aboriginal fortified towns, equally numerous, exists in the vicinity of Birtley, at the angle formed by the confluence of the North Tyne and Rede. In an area of about twenty square miles I have noticed nearly as many ancient forts, situate on the declivity of the valleys west of the watershed of the Wansbeck river and the line of the Watling Street. Within a radius of two miles from Birtley six aboriginal settlements occur. The chief of these stands on a wedge-like platform, in the Countess Park Woods, strongly defended by two concurrent ravines. The site covers, including the outer ramparts and fosse, more than three acres. It is traditionally the site of a great battle in the "troublesome times," which, as this popular term implies, have left an indelible memory behind them. This fastness is well worthy of inspection. It is the largest and one of the most perfect illustrations of this class of these primitive works to be found in Northumberland. One of the circular huts, perhaps the residence of the chief, is of extraordinary dimensions, being forty-six feet in diameter. The foundations of the inner and outer ramparts—which are several feet high in some places—and of the dwellings within, are plainly visible. In shape it is irregularly rhomboidal—that is four sides in straight lines, well rounded off at each corner. This and the neighbouring strongholds in the valley-basin would originally correspond very closely to Strabo's description, who informs us that "the woods of the Britons are their cities, for when they have enclosed a large circuit with felled trees, they build within it houses for themselves, and hovels for their cattle." This is analogous to the practice of Englishmen of the present day, who find themselves obliged to inhabit the backwoods of Canada, or the bush of the great Australian continent. The materials used in the construction of the lowland fastnesses, as well as of the hill fortresses, so far as I have noticed, are the native freestone. Only in one instance of a series of towns on the southern slope of basalt crags at Gunner-ton, has the whinstone been used. Both are built up into Cyclopean walls of unhewn but massive stones. I have observed in several sites traces of the action of fire, the white freestone having become reddened, a proof of a long occupation by the aborigines. The hut-

circles seldom vary in form, generally retaining the round shape of the primitive moveable tents of the nomadic races, of which these are continuations and reminiscences. Probably the foundations only were of stone, and the walls, ten or twelve feet high, with conical roofs, were of wattle work, roughly stuccoed perhaps on the outside, and with the skins of wild beasts, the spoils of hunting, hung within. Bede describes such a dwelling of the Britons of the seventh century, when he tells a story (*Eccles. His.* chap. 10, p. 126) of a pilgrim returning from King Oswald's grave at Maserfield, who being benighted seeks hospitality therein. The house was of wattle work chiefly; and he tells us that, after much feasting, some spark ignited the roof, where the only opening for the admission of light or the egress of smoke was situated. The British maidens were adepts at twining with their slender fingers the withies that grew by the margin of the streams and ponds into such wattle work. Their basgeds, whence our word basket, were known and valued even in the Imperial city of Rome. Circular and square huts, such as existed in Gaul, are represented on the Antonine Column. The aborigines of the North Tyndale district and the west of Northumberland were evidently somewhat above the condition of savages. They did not wholly depend for subsistence on the casual produce of the chase. At three different places a series of terrace-lines or platforms, raised one above the other, still remain in the vicinity of the ancient towns. Near Falstone, and at Birtley, they can be plainly seen. In the latter district the forts are numerous, two declivities are, as it were, furrowed by these lines of primitive culture. One, near to the Countess Park "camp," consists of eight terraces. But the largest is on the slopes of the elevated ground above the Cary House fort. The latter is in the form of two sides of a parallelogram, which, if defined on the other sides, would enclose an area of ten or twelve acres. Six terraces face north-west, running about four hundred and fifty yards, and meet the other lines, which are about half this length. Each terrace varies in height and breadth, from ten yards to a few feet broad, and in some places they are ten feet high. Here the corn, to supply the tribe with a store for present or future use, was grown. The querns, or hand-mills, were used to prepare it, of which many specimens have been found of granite and other hard materials, on different sites. Within the memory of very aged men these hand-mills were still used.

Another noteworthy feature of the district consists in the immense heaps of slag or scorixæ of iron, which I have met with on the slopes

of the vale of the North Tynes. Many hundreds of tons of this refuse from ancient ironstone smelting may be seen in a woodland glade near Birtley, and close to two primitive forts and the last named range of terrace-lines. They are still called the "Cinder Kiln Hills."

Iron exists in abundance almost at the surface of the ground. This is proved by the number of chalybeate springs, and the fact that the smaller drainage tiles are soon rendered useless by the speedy incrustation of oxide of iron that gathers on the inner surface, from the water which holds the iron in solution. From these workings, no doubt, the long, pointless swords of the ancient inhabitants were derived, though their manufacture was rude enough, from the excessive waste evident in the process. Iron spear heads have been found on the sites of some of the forts in the Keilder district. But the flint arrow and spear heads, of which a manufactory, as I consider it to have been, was noticed in removing, for purposes of tillage, the stones of a fort near Wark village, seem to have been the usual weapons previous to the Roman-Celtic period. A copper battle-axe, with beautiful scorings, was discovered, however, last year near Corbridge.

The last class of aboriginal remains to be noticed consist of the crugan, barrows or burial mounds. Several mounds of interment have existed either within or at the chief entrance of forts, which are, as usual, facing the east, the cardinal point of the heavens to many primitive races, as the north is to us. Thus at Warden Hill, outside the entrance, is a large tumulus; and in the Carey House fort, near Birtley, a kistvaen, or four upright slabs in the shape of a chest, containing a scored vase, with the ashes of some chieftain whose body had been burnt, was found by some men draining the site a few years since, who at first fancied the vessel contained hidden treasure. On the level platform above the High Shields Green "night folds" are numerous mounds in the midst of the traces of ancient culture, evidently of later date than the mounds themselves. Under each of these, tradition asserts that a warrior sleeps. The largest is called Dan's Cairn, a reminiscence, perhaps, of the terrible era of the Danish incursions into Northumbria. But the most remarkable of these tumuli exists near Gunnerton, in the neighbourhood of the "Camp Hill," where a fort has stood, noticed by Mr. MacLauchlan. The barrow itself has not been noticed or described. It is a conical mound, thirty feet high, surrounded by a deep fosse and vallum, with covered way leading to the stream on whose precipitous banks it stands. The circumference is about one hundred paces. A wild legend, like those of the Scandinavian Sagas, is connected with it of

some supernatural being, usually termed a dragon, keeping watch over a secret hoard at its centre. At some distinct date there has been an attempt to learn the truth of this tradition. The mound, which is still called the Gunnerton Money Hill, has been scooped out to a considerable depth from the top and eastern side.

These castrametations—terrace lines of field culture workings for iron—and burial mounds are the chief vestiges remaining in this part of Western Northumberland of its aboriginal inhabitants. They are interesting relics of a departed race who peopled this island in times before the dawn of history. When we ask who the builders of these cyclopean structures were, and when they lived, we are unable to give any definite reply. Most probably they were a portion of the Japhetan family, who, as Mr. Wright informs us, first overspread the countries and islands of Western Europe. When we compare the characteristics of these early remains with those by antiquaries elsewhere in England and Scotland, we may, perhaps, conclude that these ancient Northumbrians were of the Celtic race. If we follow the guidance of Ptolemy and other ancient geographers, we may further decide that the tribe or nation was that of the Gadeni, whose exact tribal boundaries are not accurately ascertained, but who appear to have peopled the western parts of Northumberland, the small portion of Cumberland north of the river Irthing, the western part of Roxburghshire, the whole of the county of Selkirk, with Tweeddale, a great part of Mid-Lothian, and nearly all West Lothian. This warlike and powerful tribe had the Brigantes as their neighbours south of the Tyne, and the Ottadeni eastwards on the coast of the German Ocean. These wild, inaccessible regions of mountain and moorland were well calculated to develop a spirit of bravery and independence. And thus we find that when the Emperor Severus invaded these parts, his legions were appalled at the strength, activity, and ferocity of the Northern Britons.

From a comparison of the materials used in the construction of the hill-forts and lowland fastnesses of this district, and their general conformation, I cannot find any sufficient warrant, as far as this region is concerned, for the supposition entertained by the Rev. W. Barnes (*Notes on Ancient Britain*, p. 41), that the two classes of fortifications were built and occupied at different, and perhaps, widely distant times. He remarks, "These wood-fastnesses (of which Cæsar and Strabo speak), seem to have been the trefydd in the lowlands and nor the caeran of our hills, which might have been antiquities even in those days"—the days of the Roman invasion and colonization of Britain.

As to the social life of these remote times, perhaps, the closest analogy and resemblance will be met with in the condition of the North American Indians, amongst whom Dr. Wilson (*Prehistoric Man*, vol. i, chap. i, p. 6) conceives that he has found "the living present of the long obliterated past of the Allophylian of Britain's prehistoric ages."

Mr. GEORGE TATE, F.G.S., etc., said that, having for several years investigated the early antiquities of Northumberland, he would respond to the call of the president. The paper read, gave an interesting description of the relative position of several of the ancient remains in Tynedale; but the author had not produced the best kind of evidence to support his speculations; nor did he seem acquainted with the facts elicited by better methods of investigation, than he had adopted. If we are to arrive at satisfactory conclusions as to the age of such antiquities, and as to the character of the people of whom they are the remains, archæologists must follow the course pursued by the geologist, who is not content merely to look at the outside of a rock and then to speculate on its age and origin; but, with hammer in hand, he will spend days and even weeks in breaking it up to find the organisms it contains, and from these he can arrive at sound conclusions both as to its age and the conditions under which it was formed. In like manner, must the antiquary condescend to use the spade and the pickaxe, to open the barrow and clear away the *débris* from ruined hut and camp, so that he may find relics which may throw light on the age of the structure and on the character of the people to whom they originally belonged. By this method, extensive explorations were made during the summers of 1861 and 1862 into the ancient British remains among the Cheviots, in the valley of the Breamish and on Yevering Bell and its neighbourhood. The Berwickshire Naturalists' Club were enabled to make these investigations, through the liberality of His Grace the Duke of Northumberland; and two reports have been printed in the *Transactions* of that body, giving an account of the explorations. Before referring further to these, I may notice that the author of the paper speaks of a copper battle-axe found near Corbridge; but this instrument is a bronze celt, peculiar for its ornamentation, but not found in association with any ancient British remains. He also calls a house described by Bede, British, while there seems to be little doubt of its being one of the ordinary Saxon dwellings. The ancient British remains examined by excavations, were in the wild hilly districts of North Northumberland, and consisted of fortified towns, the oppida of that people, great forts which crested the higher hills; smaller yet strong fortlets on the slopes of the hills and in the high valleys; hut circles, which were within towns and forts and scattered around the lesser fortlets; and barrows, the sepulchres of this people. A fortified town and ancient British oppidum, at Greaves Ash, near Linhope, is the most remarkable of these antiquities; its ruins cover an area of about twenty acres. Situated in the valley of the Breamish, on elevated ground, tolerably

level, and with the high hill of Greenshaw sheltering it on the north ; it consists of three principal parts at a little distance from each other, but all so connected by intervening buildings and defensive works as to form one town. The most important of these divisions consists of a number of hut circles, within a large circle, defended by two massive stone walls, one being from five to seven feet, and the outer one being from ten to twelve feet in thickness, and nearly a thousand feet in circumference. The explorations revealed peculiarities of structure in these great cyclopean walls, which are fully described in the published reports. The walls of the huts exhibited the same kind of masonry ; for the most part, they were quite circular, varying in diameter from eleven to twenty-seven feet, each with a well-formed entrance facing the east or south-east. Many of them were flagged with flat porphyry stones, and, in some cases, a raised row of stones across the entrance had acted as a check to a door which had opened inwards. The fire had been in the centre, as hearthstones were noticed still retaining the marks of fire, and in a similar structure near Yevering, charred wood was discovered on a central hearthstone. In one hut a rude low stone bench was observed, which may have been used as a bed. Some portions of the great defensive walls still remain five feet in height ; and in some parts the walls of the hut circles are from two to three feet high. Originally, the former may have been from eight to ten feet, and the latter as much as five feet in height, probably a tapering roof, of timber, wattle-work, and sods or rushes rested on the walls of the huts. Forts, strong from their natural position, and from the thickness of their ramparts, crown many of the higher hills ; perhaps the most remarkable is that of Yevering, a fine conical hill about fifteen hundred feet high. The summit is girt round by a thick wall, now broken down, enclosing an area, one thousand yards in circumference. Wild fancies were entertained by the antiquaries of last century respecting this place ; it was with them a Druidical temple, and one, of keener sight or stronger imagination than others, saw an altar stone with the marks of fire, which had burnt human victims. Such notions are entirely groundless. Too high and exposed to be suited for permanent residence, Yevering might be occasionally inhabited during the summer, but like others in similar situations, it was a place of refuge and defence for the people inhabiting the valleys, when they were attacked by a too powerful enemy. The people lived on the slopes of the hills, and in high and dry valleys between these hills, in circular huts, protected partly by smaller strongholds, the residences of the chiefs. These strongholds or fortlets were from thirty to one hundred and fifty feet in diameter, with thick walls similar to those at Greaves Ash ; and the huts were scattered around them ; some of which were little more than pit dwellings, dug out of the hill-side. The antiquities described, in the paper read, are similar to those among the Cheviot hills ; and it is noticeable, that they are similar to what are found in the south-west of England, in Cornwall, and in some parts of Scotland, leading to the inference, that, at an early period, the whole of the island was occupied by the same race. The arrangements, however, tell of a divided state of

society—of separate tribes and clans, often at war with each other. Exposure to similar dangers in different periods, causes the adoption of similar methods of meeting these dangers, modified, however, by different degrees in civilization. The relation of the several kinds of antiquities to each other seems analogous to what we have in the middle ages on the Borders, where there was almost constant warfare. The great hill forts are like the baronial castles; and as the cottages of Northumbrians nestled under the protection of the mediæval pele, so were the ruder huts of the ancient Britons scattered in the valleys around or near to the strong fortlets. It has been asked what is the age of these antiquities. Sir Gardner Wilkinson is of opinion that the ancient Britons, alarmed by the first invasion by the Romans, erected such strong fortifications as that at Greaves Ash to protect themselves against this new and formidable enemy. Taking, however, the relics discovered as a guide, as well as peculiarities of structure, I think, they are referable to a much earlier period. Both in the valley of the Breamish, on Yevering itself, and in the fortlets in the valley, several flint weapons and instruments and a quantity of broken pottery of the coarsest kind were found; in one of the huts was discovered a portion of an armlet of white opalised glass, similar to some obtained in Switzerland, belonging to the so-called bronze age, and similar to others from Scotland, taken out of a moss, and from under a cairn. A portion of an armlet of variously coloured glass was got out of a hut at Yevering, and a fine green glass bead out of a hut in the Breamish. Other armlets made of polished oak were in a hut on the top of Yevering. And within the same great fort was found a copper pin, which appeared to have been part of a fibula. There were no golden ornaments. The bones of a horse and the horns of the red deer were found in the valley of the Breamish. When these cities, forts, and dwellings were first constructed, the ancient Britons were far from being in a savage state; they had a rude civilization of their own, and had made some advance in art. Though their glass ornaments may have been imported from Phœnicia, they made their own bronze and flint weapons and instruments, and their domestic vessels of clay. Hunters they were doubtless, and keepers of cattle; but some of them, at least, had settled within walled towns, and were, to some extent, employed in cultivating the soil and raising corn—probably oats, for from the teeth of an Ancient Briton, taken out of a cist at Tossin, being worn flat in the crown, he may have lived upon hard vegetable feed. Numbers of querns of a primitive type, found over the district explored, prove that corn was ground and used; and as the under stone of one of these querns was found, as a flag in a hut, we have evidence of the use of hand-mills by the early occupants. Terraces on the hill sides, the most remarkable of which are at Heathpool, seem to me to mark the spots of this ancient cultivation, which indeed could only be carried on at moderate heights among the hills, since much of the lower parts of the country would be covered with swamps and woods. Two reasons would cause cultivation to be practised on horizontal terraces at an early period. Less mechanical power would be required to form ridges along the

side of the hill, and the heavy rainfalls of the mountainous regions would be less liable to wash away the soil from ridges that were horizontal, than from those up and down the hill. Many barrows had been opened; and in one of them near to Yevering Bell, an interesting discovery was made, tending to prove that iron was known to, and used by the Ancient Britons, at a period earlier than archæologists are willing to admit. In this barrow, along with flint weapons and instruments, and potsherds, some lumps of iron slag were found; and this discovery throws some light on the origin of heaps of iron slag, which I have met with in several places in the wild moorlands, distant from modern habitations. Respecting them there are no traditions, and connected with them are no remains of furnaces or other buildings; but they are not far distant from ancient British camps and forts. It is, therefore, not improbable that these heaps mark the spots where ancient Britons smelted the iron-stones of the district. In a cist at Tossin an iron weapon was found, associated with urns scored with the zigzag pattern, characteristic of ancient British interments. Of this I have given a description in the *Proceedings* of the Society of Antiquaries for Scotland. Probably enough, iron was more in use than is generally supposed; for from its rapid oxidation, it is only in very dry situations that it can be preserved. Such facts throw serious doubts over the Scandinavian classification of antiquities into stone, bronze, and iron ages. Certainly they can apply only in a very general and indefinite manner to Northumberland. Weapons of stone, wood, or bone may in many parts of the world have been used before those of metal; but it is not certain that metals were unknown in any period of British history, and it may be that the material used would depend much on the means of the individual; while the chieftain could procure the bronze sword or spear, or even the more valuable iron weapon, his humble follower may have been unable to obtain any better than one of wood or stone. I am inclined to conclude, that the remains we have been discussing belonged to the Celtic race, such a swere in possession of the island when Cæsar invaded Britain. Of any preceding race we have no evidence in Northumberland. No kumbecephalic skull has ever been discovered. All that I have seen or heard of were of the brachycephalic form, which I regard as the true type of the Northumbrian Celts. These few expositions may, I hope, give some idea of what has been done in the investigation of early antiquities in Northumberland; and I must say, that if we are to make any real progress, archæologists must carefully gather facts by actual labour and excavations among the interesting remains which abound in this county, and from these we may eventually be able, by inductive reasoning, to obtain a clearer and more extensive knowledge of primeval history.

*Antiquities of the Orkneys.* By Mr. GEORGE PETRIE. The author stated that no district of similar extent in Scotland possessed so many aboriginal remains as the Orkneys. These remains were

found in almost every island, and new discoveries were continually occurring. They frequently appeared as green tumuli of various sizes, and sometimes were unexpectedly met with beneath the surface and without any external indication of their existence. The ante-Norwegian antiquities of Orkney might be classified as—1st, Dwellings and other Buildings of Primitive Architecture; 2nd, the so-called Picts'-houses or Pights'-houses; 3rd, Barrows or grave-mounds and ancient graves unconnected with barrows; 4th, Miscellaneous antiquities, such as standing stones and cromlechs. The paper gave a general description of the first two of these classes. The dwellings were subterranean chambers or cells, and brochs or circular towers; while the character of the so-called Pict's-houses the author believed to be sepulchral, and if so they might probably belong to the same race who erected the brochs, and it might be the standing stones also. The author exhibited various ground plans and sections of the ancient buildings, and concluded with a hope that future researches would throw more light on so interesting a subject.

*On the Recent Discovery of Lacustrine Human Habitations in Wigtonshire.* By Lord LOVAINE. Dowalton Loch, in which the structures about to be described were discovered, is a sheet of water of very irregular form, about two miles long and half a mile broad, situated in Wigtonshire, on the west coast of Scotland, at the end of a narrow valley five miles in extent, the whole of which is occupied by a moss, part of whose waters flow into the loch, and the remainder into the sea near Monreith; the elevation of the water-shed near the middle of the valley being almost imperceptible. Sir William Maxwell, of Monreith, has effected the drainage of this loch at his own heavy expense, to the great benefit of his neighbours as well as himself, by a cutting at its southern extremity of no less than twenty-five feet deep, for a considerable distance through the wall of whinstone and slate that closes the valley. The water having been partially drawn off, the bed of the loch exhibits the appearance of an immense sheet of mud, surrounded by beaches of different elevations, covered with large rolled stones and angular blocks of slate. It contains a few small islets, composed apparently of the same materials as the beaches. Sir W. Maxwell, having heard that a bronze vessel had been found in the mud near the southern shore, succeeded in obtaining it, but could not trace other articles of the same description reported to have been found near it. On visiting the spot, 19th August, 1863, to obtain further information, I observed some timbers standing

on an island near the centre of the loch, and was told that some one had been there in a boat when it first appeared above water, and had found bones, a small granite quern, and piles, and a spot was pointed out to me at the extremity of one of the little promontories where similar piles were observable, which, on inspection, I found to be true. These piles varied from a foot to eighteen inches in circumference. Sir W. Maxwell's bailiff, Mr. Chalmers, who displayed great zeal and intelligence throughout these researches, having proceeded to the spot to secure labourers for the next day's search, reported that, though it was not possible to reach the larger island, a smaller one was accessible, and that a canoe lay near it. On reaching the island over about forty yards of mud, I found it nearly circular, about thirty-eight yards in circumference, and thirteen in diameter. It was elevated about five feet and a half above the mud, and on each side of it were two patches of stone, nearly touching it. On the north side of it lay a canoe of oak, between the two patches, and surrounded by piles, the heads just appearing above the surface of the mud;—it was twenty-four feet long, four feet two inches broad in the middle, and seven inches deep, the thickness of the bottom being two inches. On removing the stones which covered the surface, several teeth, apparently of swine and oxen, were found; and I proceeded to cut a trench round the islet, and upon coming to the southern end, a small quantity of ashes were turned up, in which were teeth and burnt bones, a piece of a fine earthenware armlet of a yellow colour, and a large broken earthenware bead, striped blue and white, together with a small metal ornament, apparently gilt; two other pieces of an armlet of the same material, one striped with blue and white, were also found on the surface. On cutting deeper into the structure (the foregoing objects having been found on the outside about two feet from the top), it proved to be wholly artificial, resting on the soft bottom of the loch: the uppermost layer was a mass of brushwood about two feet thick; beneath it large branches and stems of small trees, mostly hazel and birch, mingled with large stones, evidently added to compress the mass; below that were layers of heather and brushwood, intermingled with stones and soil, the whole resting upon a bed of fern about a foot thick, which appeared in all the structures examined to form the foundation. The whole mass was pinned together by piles and stakes of oak and willow, some of them driven two feet and a half into the bottom of the loch, similar to those above mentioned. The islet was surrounded by an immense number of these, extending to a distance of twenty yards around it; and the

masses of stone, which were apparently meant to act as breakwaters, were laid amongst them. The one next examined stood about sixty yards off, at the extremity of a rocky projection into the loch, but separated from it by the now hardened mud. It was smaller, and the layers were not so distinctly marked, and some of the timbers inserted in it under the first layer of brushwood were larger, and either split or cut to a face. A stake with two holes bored in it about the size of a finger, a thin piece of wood in which mortices had been cut, and a sort of box, the interior of which was about six inches cube, with a ledge to receive the cover, very rudely cut out of wood, were found. I succeeded two days afterwards in reaching the largest islet in a boat. It appeared by measurement to be three feet below the level of the other islets; but it was much larger, and several depressions on its surface showed that it had sunk. Wherever the soil was not covered with stones and silt, teeth were scattered all over it. We found quantities of bones at different depths in the mass, but always below the upper layer of faggots, and towards the outside. The progress of the excavation was very soon stopped by the oozing in of the water; but a workman, plunging his arm up to the shoulder into the soft material, brought up handfuls of the fern layer, mingled with sticks and hazel nuts, and large bones, believed to be those of oxen. Near the spot lumps of sand and stone fused together were picked up. On the south side of the island extraordinary pains had been taken to secure the structure; heavy slabs of oak, five feet long, two feet wide, and two inches thick, were laid one upon another in a sloping direction, bolted together by stakes inserted in mortices eight inches by ten inches in size, and connected by squared pieces of timber three feet eight inches in length. It extended to the length of twenty-three yards, and its base, about five yards beyond the surface of the mud, was formed of stems of trees laid horizontally, and secured by stakes. In other respects the formation resembled that of the other islet, but it was far larger, measuring one hundred yards round by about thirty-six yards across. No building of any sort was discovered, but a large plank of oak, twelve feet long, fourteen inches broad, and seven inches thick, lay covered with stones on the north side. The sinking of the mud had by this time laid bare a second canoe between the islet first examined and the shore; it was eighteen feet and a half long, two feet seven inches wide, and barely two inches deep: a block of wood, cut to fit a hole left probably by a rotten branch, was inserted in the side, two feet long, seven inches wide, and five and a half inches thick, and had there been secured by pegs driven through the side; across

the stern was cut a deep groove to admit a backboard. A hole two inches in diameter was bored at about one-third of the length of both canoes in the bottom. This was so rotten that it would not bear my weight without breaking. The next day, being unable to reach the last mentioned island, I found upon the spot which had been indicated to me on my first inquiry no less than six structures, similar to those before described, in a semicircle. They were, however, much smaller, apparently single dwellings. Though upon some of them charred wood was found, nothing else was discovered except a morticed piece of timber, which might have drifted there; and in one, inserted under the upper layer of brushwood, a large oak timber, measuring eight feet long by three feet in circumference. Throughout these investigations no tool or weapon of any sort has come to light. In the layers the leaves and nuts were perfectly fresh and distinct, and the bark was as plainly distinguishable on the stems and timber as on the day they were laid down, as were also the heather and the fern. It is difficult to conjecture the state of the loch when these edifices were formed, and whether or not they were completed at one period. The finding of the large stones in the layer of ferns might lead to the belief that they were gradually raised as the waters of the loch increased, and the necessity of strengthening them by breakwaters would seem to prove that the loch must have risen considerably before they were abandoned. No other sort of building has been discovered on them; but the great number of teeth scattered over the surface of the larger island, and even on the mud surrounding, and the immense expenditure of labour indicated in the shaping and hewing of the large timber with tools, which must have been from the work produced of the rudest description, betoken apparently a considerable population. The loch must have remained for a considerable period at each of the different levels before mentioned; at one time six or seven feet above its last level (that is, before its drainage was effected), to which it was reduced by three cuts made to feed neighbouring mills, one certainly of great antiquity. At three feet and a half below the ordinary level there are unmistakable appearances of a former beach, with which the top of the first mentioned islet almost exactly coincides. It is remarkable that, though there are many rocky eminences in the bed of the loch, none bear token of ever having been used for the erection of these dwellings, which seem to have invariably been based upon the soft bottom of the loch, where the intervening mud and water may have afforded the inhabitants a greater security from attacks from the shore. I had not time to examine fully the shores of the

loch, but I was assured by Mr. Chalmers that he had examined them carefully without finding traces of other structures. On a hill to the south there are remains of a Danish fort (*i. e.* a circular entrenchment); and the very ancient ruin called Long Castle is on an adjacent promontory on the north side.

Since writing the above, a very old man in Sir William Maxwell's service told me that in clearing out a channel between a small wooded island in Myston Loch, close to Monreith House, and the beach, he remembers there being found layers of timbers, piles, and flat stones laid in circles. I have also obtained from a farmer living near Ravenstone Moss a paddle of black oak, three feet long, fourteen inches broad, and one inch thick, which with four or five others he had found in that moss, lying close to a mass of timbers about six feet from the surface; this I have every reason to believe formed part of a structure similar to those described. I should have mentioned that, though retaining its shape, the timber is for the most part completely decayed, except where it has been protected from the action of the mud.

Dowalton Loch lies one mile to the left of the highroad, half-way between Wigton and Port William. The name of the loch is probably derived from the MacDowals, formerly lords of this part of the country, and possibly of Irish origin, constant communications with the north of Ireland having taken place from the earliest period. Sir William Maxwell suggests as an easy explanation of the different levels found in the loch, that the waters originally discharged themselves into the sea from the western end of the valley, a portion of them only now finding an exit that way, in consequence of the formation of the moss towards the centre of the valley, which compelled the remainder to flow into the loch. In this case the structures must be supposed to be formed in the early stages of the growth of the moss, whilst the loch was so shallow as to make it easy to raise the moss above its waters, and yet deep enough to float canoes, and afford the desired security from an enemy,

Professor WILSON said that a good deal of attention had been paid to this subject by Scottish antiquarians; and Mr. Joseph Robinson of Edinburgh had collected a great deal of important information, showing that a large number of lacustrine structures existed in that part of Great Britain. In a communication from Kincardineshire, addressed to the Earl of Buchan during the time he was president of the Society of Antiquaries, there was a description of a lake in which there were lacustrine habitations. There was also a description of numerous bodies of animals, and of various bone ornaments. Two of

the latter are still preserved in the Museum of Antiquaries, one of them being a plain circular disc, and the other an elaborate interlaced ornament. Similar ornaments were found in early British graves. He was justified in saying that the subject was a very interesting one, particularly at the present time. The opinion he had formed in relation to the discovery of bronze and of metals generally, was that they belonged to a much earlier period than antiquarians had hitherto been disposed to assign to them. The discovery of flint instruments in Suffolk, and the more remarkable discovery in Gray's Inn Lane, London, were altogether free from the supposed difficulties or doubts of modern speculation; and, therefore, were of special importance in the present stage of the argument.

Sir CHARLES LYELL said he thought it was perfectly clear, from the paper which had just been read, that there must have been several successive changes of level in the lake referred to, and he should have been glad to have heard from the author, and also from Professor Wilson, what, in their opinion, is its probable antiquity. The alteration in the levels would account for the changes spoken of by the author. Lord Lovaine had suggested that the changes of level had been brought about by the growth of peat impeding the ancient outlet of the lake. Now, if the archæologist could determine a proximate date to the lowest of these dwellings, and to the ornaments that were found there, it would throw light on one of the most interesting questions in chronology. It would throw light on the rate of the growth of peat, one of the modes of measuring the chronology of what geologists considered very modern periods—modern, that is, in reference to the existence of man; for those lake dwellings, as far as we knew, all of them relate to a period when the form of Europe was just what it is now, or what it was when the Romans conquered Gaul. Contrasted, therefore, with the period of certain animals found in particular formations, these lake habitations were all modern affairs; and if the bronze period could be carried back, as Professor Wilson had remarked, to ages far more remote than had previously been thought, those lake dwellings which exclusively belonged to the stone period, but which also strictly belonged to the period of the living groups, and were long posterior to the time of the extinct animals, must be proportionately ancient, contrasted with historical times. He saw a letter the other day from an able Swiss writer, in which it was stated that not less than one hundred and sixty lake dwellings had been found on the lakes of Switzerland. A large proportion of these lakes had been examined, and it was perfectly clear that some of them belonged to the stone period, without the slightest admixture of bronze. Not far from one of these stone period dwellings there might occur one in which there were, perhaps, two thousand instruments, all of bronze, with hardly a mixture of stone. This was a most important fact in connection with the investigation of tumuli, inasmuch as it was said, with great propriety, that the stone may have been employed sometimes by those who could not afford anything better, while those who were more wealthy used weapons of bronze. It was also said that there must have been a gradual passage from one

to the other. But if in some of those lake dwellings—which were geologically recent—there were found some instruments of stone, and in others, at no great distance, instruments of metal, it was perfectly clear that there was no danger of confounding the two—that there was a long period during which the stone implements prevailed, and another in which bronze or metal prevailed, and that in some cases there appeared to be a gradual change in the art of making those instruments. If, therefore, the bronze period could be carried much further than the antiquaries generally supposed, how ancient must those villages be where there was nothing but instruments of stone. And yet both epochs belonged to a period in which there was not found one of those extinct animals of which geologists had found so many unequivocal remains. He might take that opportunity of saying that however convinced he was that there had been a great number of frauds practised, especially in the valley of the Somme, owing to the great demand for specimens, yet he was also perfectly convinced that ninety-nine—certainly more than ninety—out of every hundred which had been submitted to examination were genuine. His faith in the antiquity of the instruments referred to was not shaken by any of the impositions which had come to light. The fraudulent specimens were invariably covered by a matrix, on the removal of which all the signs of age and of use by man were wanting. They wanted the discoloration of surface, and the original black fringe, and the incrustations of crystallised carbonate of lime, which characterised the genuine instruments. They had also other marks of their pretended character, which are easily distinguished. It had been observed in reference to the flints of Abbeville that if the workpeople there could impose on so many English and French scientific men, how could we know that we had not been imposed on before! First of all he would say that there was an essential difference in the character of the heads, but he would also remark upon a piece of evidence on which every person could judge as well as scientific men. Was it possible, that after we had gone on for nearly twenty years finding flints of the ancient type so rarely that only two or three would turn up at Abbeville during the course of a winter's digging—was it possible, or at least likely, that all at once, in three different places several miles apart, and in gravel of a different character, an epidemic, so to speak, should break out of just the particular types that were wanted? That was a consideration which ought to have prevented many persons from believing in the authenticity of all the specimens that had turned up. Referring again to the peat growth question, he might remark that it appeared from an island in a lake, in the county of Cavan, Ireland, that the lake had acquired additional depth in consequence of the growth of peat stopping the outlet. He could not help hoping, therefore, that we should by degrees get such a measure of the possible growth of peat under such situations as would serve, to a certain extent, to help us in speculating on the minimum of time which a growth of thirty feet of peat may have required. He still hoped that, upon examination, there would be found not merely ornaments but implements, and the remains of domestic and wild animals of the

period. If the lakes of this island were searched with anything like the diligence which was shown in Switzerland, we should doubtless discover a great deal of most important information on the subject of these newly-discovered habitations.

*On certain Markings on the Horns of Megaceros Hibernicus.* By Professor BEETE JUKES, F.R.S. (C.) Two large portions of bone, found at a depth of forty feet in a peat bog near Longford, were indented near the middle with depressions, arising, in the author's opinion, from pressure exerted from above while they lay at right angles, one upon the other.

Dr. FALCONER said that he had arrived at a diametrically opposite conclusion. Bones of reindeer, cut in precisely a similar manner, had been found in various bone-caves, the *rationale* of the markings being that the strong extensor tendon had been removed by sawing it away from the bone, just as the Esquimaux do at the present day. The "cross-hatching" marks, often to be seen on such mammalian bones, were undoubtedly produced by human weapons. Natural pressure would not have removed the strong outer layer of the bone, and preserved the weak, cancellated interior.

Professors Rupert Jones, Tyndall, and Wyville Thomson concurred with Dr. Falconer, as to the artificial character of the indented cuts—Sir W. Armstrong and Mr. Sorby taking the opposite side of the question.

*Notes on Sir C. Lyell's "Antiquity of Man."\** By Mr. JOHN CRAWFURD.

Sir R. MURCHISON said that he had no doubt that the paper which had just been read would create a great deal of discussion. On one point, at least, the author had succeeded in showing that Sir Charles Lyell had made a little slip in the recent work which had been published by him—namely, in attributing to all languages no greater antiquity than a thousand years. Upon the whole, he congratulated Mr. Crawford upon the manner in which he had treated the subject; and being an unbeliever himself in the doctrine of the transmutation of species, he cordially approved of the general tenor of the paper.

The Rev. Dr. HICKS said that he differed so entirely from the author of the paper, that he would not have it supposed that if he did not say anything against some portions of the paper, they were to conclude that he agreed with them. The paper was in fact a complete *omnium gatherum* on every conceivable subject, and it was wasting the time of the section to discuss such a paper. The part he should especially speak on was where he could see very clearly that Mr. Crawford had written the most entire nonsense. He pretended to criticise Max Müller, but it was clear that he did not in the least understand what Müller's theory was. He thought it a great pity that Mr. Crawford should meddle with such subjects, because it was very evident that he was quite ignorant of the science of language.

\* This paper was read before the Ethnological Society in April last. See *Anthropological Review*, p. 60.

After dwelling on matters of detail, and exposing what he thought to be the fallacy of Mr. Crawford's assertions and reasoning, he concluded by urging the importance of having a separate section, in which there really could be scientific discussion, especially for questions connected with the science of language.

The Rev. JAMES BRODIE, of Monimail, said, that after having carefully examined Sir Charles Lyell's work on the Antiquity of Man, he had come to the conclusion that he (Sir Charles) had utterly failed to prove that man had existed more than four thousand five hundred years. If there had been time and opportunity he would willingly have stated his reason for coming to that conclusion. As to the origin of variety in the human species, it was very evident, when the mental and bodily characteristics of man were taken into account, that there was but one species. It was very difficult to determine how and when the different varieties came to be formed from the parent stock. The Egyptian mummies and the pictures upon ancient temples proved that distinct races had existed for a great length of time without physical alteration.

Sir GEO. DENNIS said that, like the previous speaker, he also had carefully read Sir Charles Lyell's work, but so far from differing, he cordially agreed with the conclusions at which that learned author had arrived.

The Rev. J. D. GEDEN, of Manchester, said that the whole structure of the Indo-European languages, throughout their geographical area, was substantially the same. The syllables were constructed on the same principle, and the words were subject to the same laws of accident and derivation.

Sir WALTER JAMES said, that while he admired the ability and skill displayed by Mr. Crawford in the preparation of his essay, he totally differed from him on some important points. Mr. Crawford's hypothesis assumed that the first man, or the first set of men, must have been savages—a theory quite inconsistent with the notion that man was created by a Supreme Being. Arguing *à priori*, the first man created by the Supreme Being could not have been imperfect of his kind, but must have been endowed with strong intellectual and physical powers.

Dr. DONKIN said that Sir John Herschel had clearly shown that where a man was reduced to a point little above the ape in point of intelligence he was physically the most imperfect creature on the face of the globe.

Professor WILSON said that an essential distinction between man and the lower animals lay in the fact that man was what might be called a naturally domesticated animal, whereas the natural state of the lower animals was wild and untamed. Take the wild ox from the plains of India, house and feed him, and give him an artificial existence, and very soon there would be discernible differences of constitution and form distinctly traceable to the new mode of life. In one respect the one would be improved; that is to say, he would be better fitted for the purposes for which man required him, but the animal would, in point of fact, be degraded from his natural position.

But if man were taken from a wild and savage state and domesticated and civilised, everything that was truly noble in him and natural in him would be improved and developed. This proved that man was totally distinct in his primary condition from the lower animals, and that in his first state he must have been—not a half-bred savage, but a thinking, intellectual, noble being. The question of the development of varieties in the human race was one the solution of which would be slow and laborious, and he sincerely hoped that scientific men would not jump to rash conclusions. It was premature to bring forward the ethnological question of the unity of the human race as one capable of receiving a distinct answer. Much light must be thrown on the relations of languages and other subjects before science could solve the problem. In the meantime scientific men must be content to wait and to work backwards from point to point in their investigations—from known to unknown languages and races. One illustration in point could be easily produced, and it was a very valuable one, as showing the development of a new variety of men. When the Anglo-Saxon passed over to the continent of America with the Pilgrim Fathers they were distinguished by all the characteristics of Englishmen. Two hundred years had passed away, and what with the influence of climate, food, and perhaps the admixture of Indian blood, the American race had grown out of the old stock. One could hardly see an American in the street without knowing him to be such. It was important that those who rashly challenged the doctrine of Sir Charles Lyell as to the antiquity of man should bear this fact in mind, for if two hundred years had been sufficient to develop a New Englander, one could easily imagine that the thousands upon thousands of years Sir Charles was prepared to assign to man's past existence were sufficient to change either a white man into a negro or a negro into a white man.

Mr. CRAWFURD, in reply, stated that the exceptional instances of new breeds quoted by Mr. Brodie from the animal kingdom proved nothing in relation to the varieties of the human race. He could point to equally remarkable cases in the human family. Many years ago he met in Burmah a man covered all over with hair, and having no teeth. This man married a fair woman and had two children, one of whom, a boy, was fair, and the other, a girl, was, like her father, covered all over with hair and had no teeth. When the girl grew up, some friends of his were anxious that she should marry, and accordingly they offered a large premium to any one who would take her for a wife. At length a man was found who was sufficiently courageous to do so. Two children were born of the marriage, and again one was fair and the other exactly the counterpart of its mother. But such exceptional facts could not account for the immense varieties in the human species. As to the Americans being a distinct race, there were probably a dozen or more American gentlemen in the room, and he defied Professor Wilson to point them out.

Sir RODERICK MURCHISON congratulated Mr. Crawford on having elicited so interesting a discussion. As a geologist, he was impressed with that portion of Sir C. Lyell's work which had reference to the weapons used by the aborigines of France and England. The

character of the formation in which they were found proved clearly that they must have been deposited there ages before the period usually assigned for the creation of man. The application which Professor Wilson had made of that fact was a very important one, for if ethnologists had so much longer a period in which to carry on their researches, they might find means to account for the great changes that have taken place in some portions of the human family.

*The Antiquity of Man.* By Professor PHILLIPS (C.)—He said that one of the remarkable fruits of Geological investigation was to invest almost every point on the earth's surface with a new interest. The small French village of St. Acheul had long been remarkable for the school of the Jesuits established there; but antiquaries had discovered that it was near a burial ground of great antiquity. In the course of excavation there were discovered the graves of people far more ancient than any known to have been buried there. Other memorials were also discovered; and on one he had obtained from the workmen he read the name of Constantius. A stone coffin was found, and also an armlet, which had been placed on the arm of a buried person. When they looked in front of the great face of excavation, and saw overhead the Jesuit College, the ancient cemetery, and the Roman and Pre-Roman graves, the question arose, "What could be the antiquity of the sand and gravel deposit at the lower level?" In Sir Charles Lyell's recently published volume the situation was fully described. Concerning the deposits, there was no difference of opinion; they were to be reckoned among the later deposits of the geological time, and in the lower parts of these deposits a great number of interesting implements had been obtained, and some of these he exhibited. He described the deposits in detail, from illustrations, stating that fresh water and land shells were found in sand and scattered flints in an argillaceous deposit over it. For the fresh water and land shells in the gravel it was not necessary to appeal to the action of the seas, which, however, was seen in the lower part of the level. There were, in different levels, cases of great agitation of water, comparative agitation, and comparative tranquillity. They might imagine a lacustrine deposit, against which there would be the objection that it would not produce gravel in such a form, it being twisted about in all ways. There ought to have been found lying parallel to the surface of the lake a great number of lacustrine shells; but that was not the case, and the explanation would not apply to the mixture of fresh water and land and amphibious shells. The more ordinary explanation was to suppose the action of a river which had changed its position, so that the flint

instruments found near the bottom might formerly have existed near the top. The arrangement of the sands was obviously of such a kind that they floated over the pebbles, and covered all below. The whole question came finally to this:—Could they determine the age of the gravel beds? They could not escape the conviction that the flint instruments were of the same age as the gravel beds. Upon the supposition of strata having been deposited by river action, the upper surface of the deposits would continually tend to become level, and would be so when the deposits were of an argillaceous nature. In this case the slope varied from  $2\frac{1}{2}$  to  $1\frac{1}{2}$  degrees. In order to account for the present condition of things, it would be necessary to suppose that the country had been disturbed, and that there had been an elevation affecting the valley of the Somme. On an examination of the locality they would speedily arrive at the impression that it was requisite to remember that there was no period of geological history from which it was safe to exclude a movement of the earth's crust. The map of France showed the causes of the elevation. The rivers ran in parallel lines across the chalk, and it was impossible to separate the circumstance from the similar fact in this country, where these phenomena had been discovered. As there was reason to think that the valley had been subject to upheaval, accepting the supposition, they would not be able to determine the question of age by the excavation of the river. If they followed the suggestion of Sir C. Lyell, and took their measure from Scandinavia, they might come to some determination as to time; but this was a case of a local disturbance of the earth's crust, affecting certain lines of country in a given direction, and apparently ceasing beyond that. As it would be to some purpose to ascertain the antiquity of these deposits, he trusted Sir C. Lyell would not think it otherwise than a compliment to hear an opinion differing from his own.

Mr. WARINGTON SMYTH said that it was only during the last few years that this series had engaged attention. In the main facts, as they might be taken by the public, geologists were pretty well agreed; but, nevertheless, the results to be deduced were so momentous in regard to the history of man, that they must be obliged to gentlemen who devoted not only days, but even years, to the elaboration of the details. Professor Phillips differed in no great degree as to his facts from Sir C. Lyell; but as to the explanation of these phenomena and the physical agencies by which they had been produced there were differences of opinion, some attributing the present position of these curious strata to the erosive action of water, and some to elevations which we knew from other sources the whole of these countries had been subjected to within a recent period.

*On the Alluvial Accumulation in the Valley of the Somme and Ouse.*  
By Mr. R. A. C. GODWIN-AUSTEN, F.R.S.—The object of this paper was to show that these two river valleys belonged to areas over which the geological changes had differed so greatly that, at present, comparisons could not be made; that the materials of the gravel-beds of the Ouse had, like those of all the rivers of the east of England, been derived from the “boulder formation;” and that the state of the animal remains indicated that they belonged to the fauna of the period antecedent to the boulder clay; consequently that, should it be proved that flint implements were to be met with in the Bedford gravel-beds, it would not prove that the *Elephas primigenius* and its associates were contemporaneous with man. The valley of the Somme was shown to belong to an area which lay beyond the “boulder formation”—that the series of alluvial beds differed greatly in respect of the physical conditions under which they had originated, yet that they indicated a definite order of succession, and implied a vast lapse of past time; in each of these flint implements have been said to have been found. The only evidence on this point which the author considers to be reliable is that with respect to the Champ de Mars, near Abbeville, where the beds belonged to the most recent portion of the alluvial series of the Somme, in the “subaërial” accumulations. The author further attempted to show that there is no sufficient evidence of a post-glacial elephantine period; and also that the Somme valley could never have been the line of drainage of a vast river, but that the phenomena of river alluvia at great elevations are to be accounted for by physical changes of definite date.

Sir C. LYELL said he had expected to hear Professor Phillips and Mr. Godwin-Austen express a wider divergence from his own conclusions than they had done. He took it for granted that Professor Phillips agreed with him in the important point that not only the flint implements which he mentioned in the case of St. Acheul were of the same age as the old river gravel, but also the extinct mammalia. It therefore appeared that they agreed in the important point of the co-existence of man with those extinct animals. The new view which he had attempted to explain was that the upper valley gravel, some eighty or one hundred feet above the level of the sea, was not now in the position it was when the river flowed there, and formed this extensive deposit of sand and gravel. If he understood the argument, there was such a slope of the gravel covered with loam towards the Somme as there would not be if it was the deposit of a considerable river in its original state; in that case the slope would be the other way, from the river towards the bluffs, as in the case of the Rhine and the Mississippi. He was not prepared to say whether it was possible to calculate on the identity of the present state of that surface

with what it was at the very remote period when it was formed, and since which it must have had so many washes by rain during many thousand years. He was not prepared to say whether they could reason in that manner as a change of position. What he said was, that there was nothing in his speculations on the river gravels hostile to the conclusions which Professor Phillips had proposed of there having been possible local movements, or, at any rate, a considerable movement of that country since the old river flowed. He thought it was almost impossible that that should not be the case. Indeed, when he found two levels of river gravel, one higher and the other lower, it generally appeared to him that that must be in consequence of some great movement, that there must have been probably some stationary period, when great accumulations took place; and that there must have been a period of movement, the waters eroding and cutting away the country, until they settled down at a lower level, and there was a formation of gravel there. This was a most probable thing; but they must bear in mind that though they talked of these appearances at two different levels, there were occasionally intermediate levels and deposits of gravel even higher than St. Acheul. It would be difficult to suppose that it was always strictly at two levels that these gravel beds occurred; but there was a prevalence of them at a higher level and at a lower level, that lower level being necessarily higher than that of the present Somme. He, therefore, had no objection to suppose that, after the country had been for some time in that state at which the gravels and sand were formed, there was some movement or elevation during which the river was able to cut the land down, and then form the inferior or lower level gravels; and it did not appear to him that if that view were adopted it made any very essential difference. Professor Phillips thought it made this difference—that the time would be much shorter if there were such a movement, and certainly it would; but he could hardly conceive any movement would enable the river to destroy so much older strata, as it must have destroyed to produce such reiterated river beds. If Professor Phillips could bring evidence of such a movement it would be a great assistance; but that would not alter at all any views which Mr. Prestwich and himself had arrived at with regard to the manner in which the higher and the lower levels were formed. There were other proofs besides the fresh-water shells, and the absence of marine animals, of the fluviatile origin of the St. Acheul gravels. The gravel in the Somme, the Seine, and their tributaries was composed of rock that belonged to the hydrographical beds of those rivers. In addition, there was the presence of fluviatile shells as well as of land animals. He could receive the views of Mr. Prestwich that these gravels were remains of an old river; and he could admit that there might have been such a movement as Professor Phillips had supposed. Mr. Austen, in speaking of the Bedford section, had endeavoured to do away with the argument in favour of the antiquity of man, by supposing that the remains of extinct lions, rhinoceroses, and other animals, taken out of the gravel, which was about thirty feet above the level of the sea, were derived from an

older gravel. He supposed some preexisting formation, out of which the bones were taken, and then deposited in the present, so that that formation which contained the flint instruments would not be proof of the co-existence of man with those extinct mammalia, and that the mammalia existed before, and were washed out into the beds containing the flint instruments. Such an objection might be made to almost every river bed, because rivers were constantly ploughing up their channels, doing and undoing. Therefore, if any animal remains had sunk in the channel, the chances were that they would be torn out again, and rolled on before they got to their final resting place. It was perfectly true that in some of our valleys, such as the Severn, the old drift containing distinct animals will be undermined, and occasionally bones in a state of integrity will be thrown down into the new river bed. There were such cases, and they were guarded with respect to them; but as a general rule, if they found remains buried in gravel, the inference was they were formed during that long period when that ancient growth was deposited, bed after bed, and sometimes partly destroyed and re-deposited. If a geologist wished to draw a contrary conclusion, he was bound to show, first of all, where was the old formations out of which these extinct bones were derived. To make out his theory he would be bound to show that such a formation was under the drift of that country; which, however, was not the case. Under the circumstances, the hypothesis seemed a violent one, formed to get rid of a violent conclusion, to suppose that these bones had been derived from some other formation that existed in the neighbourhood, without a shadow of evidence of there having been such a one, and with all the existing evidence against it. He hoped the conclusion was one which, on reconsideration, Mr. Austen would not continue to maintain.

The Rev. S. W. KING gave an interesting description of a section of the Norwich crag exposed by a recent fall of rock, and said he thought the name of the rock was too local.

Dr. FALCONER could not accept the views of Mr. Godwin-Austen as to the mammalian remains in the implement-bearing gravels having been derived, like the inorganic materials, from a pre-existing age. No two mammalian faunas could be more unlike than those of the pre- and post-glacial ages. The Miocene Tertiary was marked by an exuberance of pachydermatous animals, and an excessively small development of ruminantia. Then, after a lapse of time so great that 1700 feet of strata had been formed in Europe, the Miocene mastodon dies out, giving place to two elephants and some colossal forms of deer; but still there was a marked absence of bovine animals. Immediately after the glacial submergence, new conditions of the surface set in, river-terraces and valley-gravels were accumulated from the pre-glacial material, but the organic contents of these were not those of the older beaches. All their characteristic types were wanting; instead of *Rhinoceros Etruscus*, *Elephas meridionalis*, and the larger deer, we had *Bos priscus* and *primigenius*, the musk ox, and the reindeer, and these bones often in a perfectly fresh condition—not rubbed, and scratched, and polished by ice-friction, as were the relics of the older time. So fresh and complete were these mam-

malian bones, that from a gravel at Folkestone, in exact parallelism with those of the Somme valley and of the valley of the Ouse at Bedford, he had obtained an entire fore-limb of *Hippopotamus*.

#### ETHNOLOGY.

*Varieties of Man in the Malay Archipelago.* By Mr. ALFRED WALLACE, F.R.G.S. In the Malay Archipelago are found two very strongly contrasted races—the Malays, and the Papuans. The former inhabit the great western Islands, Sumatra, Java, Borneo, and Celebes; the latter New Guinea and the adjacent small islands. The typical Malays are of a light brown colour resembling cinnamon or lightly roasted coffee, they have constantly straight black and rather coarse hair, little or no beard, and generally smooth hairless bodies, they are of a low stature, rather strongly made, with short thick feet and small delicate hands. The face is broad, the eyebrows flat, the nose small, well formed, with the nostrils somewhat exposed; the lips broad and well cut, the mouth large but not projecting. In character the Malay is impassive, reserved, and bashful. His feelings of surprise, admiration, or fear are not readily manifested, and he has little appreciation of the sublime or beautiful. He is somewhat taciturn, is deliberate when he speaks; he but seldom laughs, nor does he openly express his gratitude for a favour. He revenges an insult more quickly than an injury. He is honest and trustworthy in many matters, but prides himself upon his capacity of lying. His intellect is but mediocre, he is deficient in the energy necessary to acquire knowledge, and his mind seems incapable of following out any more than the simplest combinations. He is quick in acquiring mechanical arts, and therefore makes a good servant for simple routine duties. The Papuan is, in many respects, the opposite of the Malay. In colour he is a deep sooty brown or black, his hair is very peculiar, being harsh, dry, and frizzly, growing in little tufts, which in youth are short and compact, but which in adults often grow out so as to form a compact frizzly mop, nearly a yard in diameter. He is bearded, and his arms, legs, and breast are more or less hairy. The Papuan is taller than the Malay, and, perhaps, equal to the average of Europeans; the face is elongate, and the hands and feet rather large; the forehead is flat, the brows very prominent, the nose large, long and arched, with the nostrils hidden by the overhanging top. The face has thus a Semitic character, which is perceptible even in the children. The moral characteristics of the Papuan separate him widely from the Malay. He is impulsive and demonstrative in speech and action. His emotions and passions are expressed in shouts and laughter, in

yells and frantic leapings. He is noisy and boisterous in speech and action, both at home and before strangers. Of his intellect less is known, but it seems at least equal, and probably superior, to that of the Malay. He has a love of art, decorating his canoe, his house, and almost every domestic article with elaborate carving. It must be granted, therefore, that these two races are most strongly contrasted, and if mankind can be classed at all in distinct varieties, the Malay and the Papuan must certainly be kept separate. Besides these well-marked races are the inhabitants of the intermediate islands of the Moluccas and Timor, which, though differing in some degree from both, may yet, in almost every case, be classed with one or the other of them. The Negritos of the Philippines, and the Semangs of Malacca, differ in most important characters from the Papuan races with which they have hitherto been classed, and must be considered to have Asiatic rather than Polynesian affinities. The recent evidence of the antiquity of man, and his having survived geological changes and the extinction of many species of mammalia, introduces a new element into ethnographical researches, and enables us to speculate more freely on the application and origin of races. Mr. Darwin's researches on the structure and origin of the coral reefs of the Pacific, render it highly probable that great islands, or even continents, have recently sunk beneath its waters. The present distribution of animals in the Pacific Islands leads us to conclude that this subsidence is geologically recent. The inhabitants of all the Pacific islands as far west as New Guinea and Australia, have much in common, while they differ greatly from other races. Combining these facts and boldly following their indications, we may divide the Malay Archipelago by a virtual waving line through the Moluccas, so that all the tribes to the west of the line will be Malayan and of Asiatic origin, and all to the east Papuan or of Polynesian origin. This division is in harmony with that which has been shown to exist in the animal productions of the same regions, and obviates the difficulties attending every theory hitherto proposed as to the affinities and derivation of the Malayan and Polynesian races."

Professor JUKES said he could quite confirm Mr. Wallace's statements as to the distinction between the Malay and the Papuan races. He differed from him, however, in identifying the frizzled hair of the latter with that of the Negro. He was much struck with the latter part of the paper. The author had arrived at conclusions with reference to the antiquity of man, which he (Prof. Jukes) had ventured to draw some twenty years ago, though he had not ventured to state them publicly otherwise than in magazine articles and other anonymous papers. It had been for twenty years impressed upon his mind

that the great depression of land in Oceania was one of the chief causes operating for the distribution of race. If there had been a large continent in that part of the world inhabited by man, which continent has sunk and disappeared, and the tombs of which now exist in the coral islands, then the antiquity of the inhabitants of those islands would have to be dated from very far back indeed. In private discussions among his friends twenty years ago he never attributed to the human race an existence of less than a hundred thousand years. He had no data for arriving at that opinion, but the impression had been produced on his mind, and he still entertained the same conviction. A hundred thousand years was, after all, a small period to allow for the depression of a vast continent and the springing of a number of coral islands out of the bed of the ocean.

Dr. JAMES HUNT said that the paper which had just been read was one of the most important that had been submitted to the notice of the British Association. In the last portion of it the author very properly stated that the modern discovery of the vast antiquity of man had opened up fresh ground, and had, in fact, put the whole science of man in a new light. Some four years ago he had the honour of reading a paper before the Association on the harmony of the evidence in support of the antiquity of man, and on that occasion he spoke of the inadequacy of any of the views which had then been publicly put forward. The fact was, that when we talked of the existence of the human race we got out of our depth, and there were no data on which to build our conclusions. When he read the paper to which he alluded before the Association he quoted a remark from a German work which produced a smile, and which would probably have a similar effect now. The remark was to the effect that man had existed for not less than 35,000 years, and that there was every reason to believe that he had existed for nine millions of years. With reference to the question of race, the author of the paper very properly attached great importance to the principles of art which were found in different races. He entirely agreed with that sentiment. He would ask the author, however, whether he thought that similarity of language was a test of affinity, and whether, in the absence of civilisation, he did not admit that in certain races there was an inability to accept civilisation? Mr. Wallace ascribed the changes that had taken place in the races of Europe and America to physical causes. He would ask whether there was not a mental influence also at work in producing these changes?

After a few remarks from Mr. Crawford,

Mr. WALLACE said that the questions which Dr. Hunt had put to him were exceedingly difficult ones. With regard to language, he thought it was inferior as a test of race to physical and moral characters, but it was a very good test of close affinities of races which had been recently separated. It did not appear to him that it could be said of any race of men that it was unable to accept civilization. The inhabitants of Great Britain were once savages, and the Romans might have said of them that they were incapable of receiving civilisation, with as much justice as we could say so of the Negro. As-

suming the correctness of the hypothesis of the remote antiquity of man, it might be argued that if one people—the Britons—could exist 50,000 years uncivilized, why could not another race exist 52,000 years without losing their capacity for improvement. With regard to the influence of mind on the changes of race, there were no doubt many varied causes to be taken into account, and he was not prepared to say that any particular influence had not been at work.

Sir J. RICHARDSON said that the very first problem in reference to the antiquity of man had not yet been solved. As yet we could not venture to state what was the precise age of a bank of peat moss. The paper which had been read seemed to him to strengthen the theory of the unity of the human race. If ethnologists had only time to work out the changes in the human family some very serious difficulties would be removed.

*Ethnology of Eastern Manchuria.* By Captain FLEMING. The particulars in this paper will be found in the recent work of this author.

*On the Ethnology of Ceylon, referring especially to its Singalese and Tamil inhabitants.* By MUTU COOMARA SWAMY. The author commenced by saying that the population of Ceylon was nearly three millions, and that its inhabitants, who were distributed among a great variety of races, might be classified under the heads of European, Asiatic, and Eurasian. The population was not great, and consisted chiefly of English, Irish, and Scotch emigrants, employed in the civil and military service, or on the plantations. The Asiatics of Ceylon are the Veddahs, the Singalese, the Tamils, the Moors, and the Malays. The Veddahs are hunters, and are supposed to be the aborigines of the island. The Tamils of Ceylon belong to the same race as the Tamils of Southern India, and consist either of those who have been on the island for centuries, or who are recent emigrants. They are to be chiefly found in the north-east portion of the island, and their two great capitals are Jaffna and Trincomalee. Their main occupation is agricultural. The coolies are the labourers of the island. They cross over in large numbers from the continent during the coffee season. The Singalese are the inhabitants proper of Ceylon, and range themselves under the heads of Kandians, Low Country Singalese, and Rhodiahs. The Kandians are the inhabitants of the hill country, and are a hardy robust race, never till recently intermingling with their low country brethren. Their language is made up of three component parts—Elu, a Singalese pure, the Pali, and the Sanscrit. They possess an extensive literature, and their religion is Buddhism. The low country Singalese are either Bhuddists, Roman Catholics, or Protestants. The influence of Roman Catholicism is very great, and

the people are divided into classes after their occupations. The Malay population of the island is small, and the inhabitants form the Ceylon Rifle Regiment. They are faithful soldiers, brave and obedient; and in their religion thorough Mahommedans. The Moors are the small traders and shopkeepers of the island.

Mr. ELLIOTT said that the Tamil nation was the type one of the two great nations of Southern India, those who spoke the language of the south, and those who spoke the language of the north. Each was totally distinct from the other; the northern dialect being derived from the Sanscrit and the south being Tamil, and having a distinct alphabet of its own. He thought it probable that the slave population had also spoken a distinct language, as there were words still used by them which were not easily recognisable in the Tamil. These were probably vestiges of a tongue which was lost in the extreme state of destitution to which the race was reduced.

Mr. CRAWFURD expressed his gratification that the population of Ceylon had increased so much within the last twenty years. He had not the least doubt, however, that the island could easily support ten millions of inhabitants, and that it would ultimately reach that number if the Government continued to be wisely and liberally administered. He believed that all the pearls used by ladies in this country were Singalese pearls, being distinguishable from the Persian by their peculiar whiteness. The Malays of Ceylon were a very useful and industrious race.

Dr. HINCKS, having made some allusions to the peculiarities of the religion of some portions of the Asiatic population of the island,

MUTU COOMARA SWAMY entered into some further particulars respecting the distinctions observable between the philosophical religion of the Hindoos and Bhuddism. The former taught the doctrine of the absorption of the soul into the Deity and of four degrees of happiness—the existence of the soul in the same sphere as God—its still closer affinity—its assumption of the form of God, and finally its absorption into the Deity. Three-fourths of the religion of the Hindoos was philosophical, and he claimed for his countrymen that they had worked out metaphysical problems of the same nature as those of Kant and other German philosophers, long before Kant's philosophy was thought of in Europe. It was, however, a failing in his philosophical countrymen that they often found themselves in cloudland, and went so far in their religious speculations as sometimes to doubt even their own existence. In this respect they showed the same fate as other metaphysicians who were apt to lose themselves in the labyrinth of their own subtleties.

*Ethnology of the Island of Formosa.* By Mr. Consul SWINHOE. This paper was read before the Ethnological Society in the beginning of the year.

*On the Origin of the Gypsies.* By JOHN CRAWFURD, Esq. This paper was read before the Ethnological Society last session. Mr.

Crawford says:—"The origin, as our old English has it, of the 'outlandish persons calling themselves Egyptians or Gypsies,' and constituting 'a strange kind of commonwealth among themselves of wandering imposters and jugglers,' is, at least, a subject of great curiosity, not to say of etymological import. Although their first appearance in Europe be coeval with the century which witnessed the discovery of the New World and the new passage to the Indies, no one thought of ascribing to them a Hindu origin, and this hypothesis, the truth of which I now propose to examine, is but of very recent date. Their Hindu origin was not for a long time even suspected; it has of late years, however, received general credence, and, I think, justly. The arguments for it consist in the physical form of the people, in their language, and in the history of their migration. The evidence yielded by physical form will certainly not prove the gypsies to be of Hindu origin. The Hindus are all more or less black; and assuredly no nation or tribe of Hindus now exists, or is even known to have ever existed, as fair as the gypsies of Europe. It is on language chiefly that we must rely for evidence of the Hindu origin of the gypsies, and even this is neither very full nor satisfactory. The dialects spoken by the different tribes of this people, although agreeing in several words, differ very materially from each other. Besides the genuine Indian words to be found in the language of the gypsies, they all contain a large intermixture of foreign tongues, consisting of words of the languages of the people they dwell or have dwelt amongst,—of Persian, of Arabic, of Turkish, of Greek, of Hungarian, and of various Sclavonian tongues; these being, in some cases,—as, for example, in the Persian,—more numerous than the Hindu words. This is what was to be looked for from four hundred years' residence in Europe, and their sojourn among oriental nations in their necessarily slow journey westward. The Indian words which exist in the language of the gypsies are by no means so numerous as the Latin ones which are found in the Welsh and Armorican, or in the Irish and Gaelic, and there will be found wanting in the Gypsy language classes of words which are indispensable towards proving it of Indian parentage. Of the migration of the Gypsies from India there is assuredly no record in Indian history, neither have we of their arrival in any Asiatic country before they reached Europe. In both France and Italy their first appearance was in an inland city, in both of which they began at once to tell fortunes; a fact which supposes, of course, some acquaintance with the language of the people whose fortunes they pretended to predict. From these two facts, it may be inferred that the Gypsies

were in France and Italy for some time before their appearance in Paris and Bologna. Most probably they came to Italy from Wallachia, through Servia, Bosnia, and Dalmatia, crossing the Adriatic; but what internal commotion led to their adventure is unknown. From Italy, where they were seen five years before they reached France, they probably found their way into the latter country. If the Gypsies were originally an Indian people (and there is no other evidence of their having been so than a few words of an Indian language), they were most probably captives, carried off by some western invader with the hope of peopling his own desert lands. I must come to the conclusion that the Gypsies, when above four centuries ago they first appeared in Western Europe, were already composed of a mixture of many different races, and that the present Gypsies are still more mongrel. In the Asiatic portion of their lineage there is probably a small infusion of Hindu blood; but this, I think, is the utmost that can be predicted of their Indian pedigree. Strictly speaking, they are not more Hindus in lineage than they are Persians, Turks, Wallachians, or Europeans; for they are a mixture of all of these, and in that in proportions impossible to be ascertained."

*The Celtic languages in reference to the question of race.* By Mr. JOHN CRAWFURD. There exist two living European languages which, going under the name of Celtic, are usually believed to be one tongue, or at least, sister languages of one origin, and spoken by the same race of men. These are, on one hand, the native language of Ireland and of the mountainous part of Scotland, which are beyond doubt essentially the same, and the native language of Wales and Brittany—which are equally sister tongues. I have long been of opinion that the two languages in question are really different and distinct tongues. The words which seem to me most distinctly to prove languages to be cognate are prepositions, auxiliary verbs and conjunctions, adverbs of time and place, those parts of speech, in fact, which form the link of language, and without which sentences cannot be constructed. When these are essentially the same in any two languages, these languages may be pronounced at once as sister tongues, while, when they differ, they may with equal confidence be pronounced as different tongues, or of different origin, although they may contain words in common. Tried by the test which I have endeavoured to describe, the Gaelic and Welsh languages will be found to be, not sister tongues derived from the same parent, as are Italian and French, but two distinct languages. Their particles and auxiliaries are wholly different. The

phonetic character of the two languages differs very materially, and; with the exception of a comparatively small number, their words are wholly different. I have compared, with all the care I could command, the Irish Dictionary of O'Reilly, with the Welsh of Spurrel. The first contains better than 50,000 words, and the last above 33,000; and, in this multitude, I could discover not more than 200 which were common to the two languages. In nearly every case of these there was a difference in the form of the words in the two languages, and this independent of the factitious difference arising from disagreement in their orthographic systems. If the facts and arguments adduced in the course of this paper are admitted, we must come to the conclusion that the Gaelic of Ireland and Scotland, with the dialect of the Isle of Man, on one hand, are the same language, while the Welsh and Breton, with the now extinct Cornish, are essentially the same on the other, the two classes of languages being essentially separate and distinct. So far, then, as language can be considered a test of race, and to the extent that one European race of man differs from another, the parties speaking the two languages must be viewed as distinct original races. The difference between the two peoples in intellectual endowment may not be appreciable, any more than it is in other European races; but, physically, I think it is admitted that the Welsh are shorter in stature and darker in complexion than the people at least of the western part of Ireland, where there has been the least admixture of foreign blood.

*On Celtic Languages in reference to the question of Race.* By RICHARD STEPHEN CHARNOCK, F.S.A., F.R.G.S., F.A.S.L. At a late meeting of the Ethnological Society of London, John Crawford, Esq., F.R.S., read a paper on the "So-called Celtic Languages in reference to the question of Race"; which paper has since been printed by the author. The paper is so badly arranged, that it would be impossible to criticise it as a whole; I therefore propose to deal with it paragraph by paragraph.

The design of the essay is to show that the Gaelic and Welsh are two distinct languages, and are not derived from a common stock. "I have long been of opinion", says Mr. Crawford, "that the two languages in question are really different and distinct tongues; and having made such inquiries as were in my power, with the view of determining the question, I propose to state the result in the present paper. The qualifications which I bring to this task are soon told. One of the two languages, the Gaelic, was the language of my childhood (I still retain some colloquial acquaintance with it); and of the

languages of some oriental nations, probably in as advanced a state when their tongues took their present shape as were the Welsh and Irish when theirs did so." This sentence is not wholly undecipherable; but it might have been a little clearer. "In order to determine the consanguinity of languages, the first thing necessary is to find a test by which consanguinity can be certainly ascertained." The following is the author's test. "When between two or more languages there is a substantial agreement in phonetic character, in grammatical structure, and in the great body of their words, such languages may confidently be pronounced to be cognate tongues, or languages having a common parentage." No doubt; but are we to understand that it cannot also be the case unless all these circumstances intervene? In the very next sentence Mr. Crawford seems to contradict himself; or, at all events, to lay down a very different proposition. He says, "the words which seem to me most distinctly to prove languages to be cognate are prepositions, auxiliary verbs, and conjunctions, adverbs of time and place—those parts of speech, in fact, which form the links of language, and without which sentences cannot be constructed. When these are essentially the same in any two languages, these languages may be pronounced at once as sister tongues; while, when they differ, they may with equal confidence be pronounced as different tongues, or of different origin, although they may contain many words in common." We are told that the languages of Southern Europe all contain a considerable admixture of Teutonic words, but that they are written easily in words derived from Latin without their assistance, while it is impossible to construct a single sentence of them with words purely Teutonic. When our author speaks of the languages of Southern Europe, I take it he refers to the Italian, Spanish, Portuguese, and Romance languages. If so, after a careful comparison of these languages with the Teutonic, I am inclined to think that Mr. Crawford has made use of the word *considerable* for *inconsiderable*. "The proportion of Norman-French in our vocabulary is usually reckoned at one-sixth part, or five-sixths of our language is of German origin, although in use, from the nature of the words of the latter, the proportion is much greater." Whence did Mr. Crawford obtain this information? If he means to apply it to what is now called English, he must have consulted some old work on the language. In the first instance, the author of the paper is wrong in making use of the term German. But I will not quibble with words, as doubtless Anglo-Saxon is intended. It is necessary to notice this, because not only is there a great difference between these two lan-

guages, but the Anglo-Saxon (at all events, in proportion to the words that it possesses) contains a much larger number of words of Latin origin than do the German languages. I am aware that Hickee maintained that nine-tenths of the English dictionary was of Saxon origin, because there were only three words of Latin origin in the Lord's Prayer; that Sharon Turner was of opinion that the relation of Norman to Saxon was as four to six; and that another writer, who estimates the whole number of English words at 38,000, assigns 23,000 to a Saxon, and 15,000 to a classical source. Thommerel was of opinion that of 43,566 words, 20,853 were of classical, 13,230 of Teutonic (Anglo-Saxon?) origin, and that the remainder were from miscellaneous sources. None of these statements, however, will hold water at the present day. Out of the 80,000 words which now make up our language, considerably more than 30,000 may be traced to the Latin and Greek. As for the Norman element, instead of its constituting, as Mr. Crawford states, one-sixth part of the English language, it probably does not constitute one-fiftieth part. After descanting at some length on the Welsh and Gaelic, in order to prove that they are distinct languages, the author of the paper arrives at the question of grammatical structure. "I come next to the question of grammatical structure as a test of the affinity, so much relied upon of late by learned Germans. It is by this they come to the startling conclusion, that the leading languages of ancient and modern Europe have all sprung out of a dead language of India, or yet more extravagantly, from a language of the highest table-land of Central Asia, of which the very name and locality are pure myths. The corollary follows that all the races speaking them—black, brown, and fair, the Celts included—are of Eastern origin;" but, as we have shown elsewhere, it is not a corollary at all. In order to illustrate what is said in the previous passages, with regard to the European languages, Mr. Crawford very unreasonably refers to the American languages (1,200 in number), which he says have a common grammatical structure—one which distinguishes them from all the other languages of the world. He says, "that this, adopting the German test of affinity, ought to prove that all the American languages had one common origin, but that the theory is at once demolished by the crushing fact that, with the exception of the languages of a few neighbouring tribes and nations which have borrowed a small number of words from each other, the vocabularies of the numerous languages in question are wholly different; and that an agreement in grammatical structure is, therefore, in this case, no evidence of language; nor does

it even go to prove affinity of race." Is not this something like a *petitio principii*? Must we, as a matter of course, assume that because the vocabularies of two languages are wholly different, that, therefore, such languages cannot have been derived from the same stock? It is not difficult to conceive that a language may lose many of its words, or that words may be replaced by other words; and that, nevertheless, the grammatical structure of the language may remain the same. Missionaries asserted that in the middle of the eighteenth century the American tribe called the Araucaños spoke hardly a word which was not Spanish, though they preserved both the grammar and syntax of their own native speech.\* Mr. Crawford says, "From the eastern borders of Bengal, to the utmost limits of China, the numerous languages spoken are, without an exception, monosyllabic, or their words consist of single syllables—which necessarily admit neither of inflection nor composition. They are, therefore, unavoidably of the same grammatical structure. But the words of these languages are wholly different, even when the race of man is the same; and of the races of man there are at least two clearly distinct ones, the Chinese being an example of one, and the Birmese and Siamese of the other." This sentence is rather foggy, but what is meant is, first, that in the tract of country referred to there are two distinct races; secondly, that although the structure of all the languages spoken in such tract is the same, the words are wholly different, not only when the race is different, but when it is even the same. In answer to this, I will simply ask, does Mr. Crawford mean to assert that the Siamese, or as it is more correctly called the language of Thai, is a monosyllabic language. If the author of the paper had taken the trouble to look into the matter he would have found that the Siamese is not a monosyllabic language; and, further, that one of the two languages spoken in Birma is a polysyllabic language.†

I may here remark, that race can never to a certainty be determined by language. People of the same race may speak two different languages, while on the other hand people of different races may speak the same language, or at all events languages derived from the same source. The French and Italians are of a different race, although both nations speak a language of the same origin, *i.e.*

\* Cf. Hervas, *Catalogo*, t. i, p. 16-23; Max Müller, *Lectures on Language*, London, 1862, p. 77.

† The languages spoken by the people north of Birma, Siam, Cambodia, and China, are all polysyllabic; whilst in Japan, at the extreme east of the Chinese empire, of the two languages spoken, the *Koyo* is monosyllabic, whilst the *Yomi* is polysyllabic.

derived from the Latin. What would be thought of a man, who, having over night given what he considered cogent reasons for not visiting Rome during the summer months, on account of the malaria, should the next morning start direct for the Holy city; or of another, who, convinced of the inutility of fomentations for gout, should forthwith set to work to bathe his great toe in cold water? But the author of the paper does something like this. After going to the trouble of adducing arguments to prove, *as he thinks*, "that the boasted test of an agreement in the mere structural form of language is inadmissible as evidence of affinity;" and having travelled to the Malayan and Philippine Archipelagos and the islands of the Pacific Ocean, to disprove the structural theory advocated by Max Müller and others, Mr. Crawford proceeds nevertheless to compare the Gaelic and Welsh, with the view of showing that in point of structure they are entirely different languages. Again, after informing us that the formation of compound words, by the help of prepositions and postpositions, has been stated to be a distinguishing characteristic of all the languages called Indo-Germanic, or Aryan; and among these, as a derivative of the Sanskrit, the Gaelic, and Welsh, the author of the paper has the assurance to tell us "that no such manner of compounding words is known to either of these languages; and, therefore, in so far as this character is concerned, they are not of the pretended class in question." This assertion is wholly inexcusable, for, if Mr. Crawford, who "still retains some colloquial acquaintance with the Gaelic," had only examined the dictionaries of the two languages in question for the space of twenty minutes, he would have found that in more than one-third of the words in these languages the first syllable is a prefix. Perhaps, indeed, there is no language in which we have such decisive evidence of the formation of words by prefixes as the Welsh. The principal prefixes in the Welsh are *ad*, *am*, *an*, *ar*, *cyd*, *dad*, *dar*, *de*, and *dy*; *di*, *go*, *gor*, *hy*, *rhag*, *rhy*, *tra*, *try*, and *ym*. The prefix *ad* or *at* is of the same force and signification as *re* in "regenerate," "return;" thus, from *ad* and *galw*, to call, we get *adalw*, to recall. *Am* is both a preposition in the ordinary sense of that word, and a prefix. In composition it answers to the Latin *circum*, and the Greek *περι*, *αμφι*; thus from *am* and *chwyl*, a revolution, is *amchwyl*, a circumvolution. *An* or *a* (which, before *l* and *r*, takes the form of *av*,) is used in a privative sense, like the Greek *av* or *a*, and corresponds with the Latin *in*, and the English *in* and *un*; thus from *an* and *mádd*, good, is *anvâd*, bad. *Ar*, as a preposition, signifies close to or upon; hence from *ar* and *mor*, the sea,

we get *Amor-ica*; from *ar* and *coel*, a belief, *argoel*, an omen, a sign. The preposition *cyd* (var. *gyd*, *gyda*) is = the Greek *συν*, the Latin *cum*. As a prefix, it varies according to the letter which immediately follows; and is found as *cy*, *cyd*, *cyt*, *cyf*, *cyv*, *cym*, *cyn*, and *cys*. Thus from *cyd* and *gradd*, grade, station, degree, is *cydradd*, of the same rank; from *cyd* and *tir*, land *cyttir*, land held in common; from *cyd* and *mer*,\* water, sea, *cymmer*, a confluence of waters; from *cyd* and *dala*, to hold, *cynnhal*, to hold together, support, maintain; from *cyd* and *stdd*, state, *cystadl*, commonly pronounced *cystal*, of the same state. *Dar*, *de*, and *dy* are used very arbitrarily, and their power cannot be well ascertained; thus from *dar* and *eb*, a saying, is *dareb*, a proverb. *Di* is a privative, = the Latin *de* in *dedecus*; thus from *di* and *fydd*, faith, is *difydd*, faithless. *Go* is cognate with the Saxon *ge*; thus from *go* and *ber*, water, we have *gover*, a small stream. *Gor* is an intensive prefix (although it sometimes serves as a diminutive); thus from *gor* and *gwag*, empty, is *gorwag*, very empty. *Hy* answers to the English termination *able*, or the Latin *osus*; thus from *hy* and *côv*, memory, is *hygov*, memorable. *Rhag* is both a preposition and a prefix of extensive use; thus from *rhag* and *dant*, a tooth, is *rhagddant*, a fore tooth. *Rhy* is an inseparable prefix, which adds intensity and activity to the root; thus from *rhy* and *taer*, bold, is *rhydaer*, too bold, presumptuous. *Tra* is used as a preposition and a prefix, and corresponds with the Latin *trans*. It has also another meaning, corresponding in power with the English *very*, and in form and power with the French *très*; thus from *tra* and *noeth*, night, is *trannoeth*, beyond this night, next morning. *Try* is also used in the same manner as *rhy*; thus from *try* and *llaw*, a hand, is *trylaw*, very handy, dexterous. Lastly, *ym* makes the verbs and verbals to which it is prefixed reflective; thus from *ym*, *ad*, and *nabod*, is *ymadnabod*, to know oneself.† Mr. Crawfurd considers the glossarial test in a comparison of languages the most complete and satisfactory. Having compared the Irish dictionary of O'Reilly with the Welsh dictionary of Spurrell, he tells us that the first contains more than 50,000 words, and the latter above 33,000, and that he has not been able to discover more than two hundred words common to the two languages. I will not venture to say whether the last part of this sentence is or is not correct; but when a philologist is desirous of comparing one language with another, one would think it would be the most reasonable to consult two dictionaries in which a comparison

\* In some words, as will hereafter be seen, the two first syllables are prefixes.

† Cf. Archdeacon Williams's Gomer.

could be made. Now, O'Reilly's is the most voluminous dictionary of the Irish language; whereas Spurrell's is little more than a pocket dictionary; and, if Pughe's Welsh dictionary had been consulted, the number of words would have been found to exceed 95,000. Again, "taking the Welsh vocabulary, the Gaelic words in it will not exceed one word in one hundred and sixty-six. The English language, it is needless to insist, contains an incomparably larger proportion of Latin words, directly or indirectly introduced; the French, Italian, and Spanish languages a much greater proportion of Teutonic words. Even the Spanish at least has many Arabic words. But we know historically the real origin of all these languages—know the English to be of Germanic origin, the languages of the South of Europe to be derived from the Latin; while the other elements of all of them are extrinsic." This is partly erroneous, and partly puerile. The English is not of German origin, but a language, which, if every word be taken into account, is principally based upon Greek and Latin, derived partly through Saxon and Norman French, and partly direct from the two former languages. Mr. Crawford says, "With respect to the class of words common to the Gaelic and Welsh, they seem to me to be such as we can readily believe would gain admission into the languages of neighbouring people; and the probability is, that they proceeded from the language of the more advanced and powerful, to that of the least advanced and weakest. Such infusions are well known to have taken place among rude nations in other parts of the world, where intercourse was far more difficult, and the two British islands cannot be supposed to be an exception. The words common to the two indigenous British tongues are of a very miscellaneous character, but they are never such as are indispensable to the structure of language, while both tongues can be written or spoken without their assistance." Mr. Crawford then refers to the names of plants and animals, indigenous or of foreign origin, immemorably acclimated or domesticated, with the object of showing that they are generally different in the Gaelic and Welsh. Some stress is laid upon the fact that the Gaelic possesses no specific name for the bull or the entire horse. Mr. Crawford does not inform us whether the practice of gelding was common, or even known, to the Celtic nations. The Romans, no doubt, gelded their horses, at least those which they employed for common and domestic purposes. The nations of Africa and Asia, except the Chinese, never geld their horses at all; and some kingdoms of Europe have not yet adopted this barbarous practice. The custom in question belonged more peculiarly to the Scythians and Sarmatians,

than to any other nations; and the Franks first learned the art and custom from the Hungarians, and to this day the French call a gelding "cheval hongre." Mr. Crawford says, "the existence of Latin words in any Gaelic writings handed down by tradition, I may take this opportunity of stating, would prove them to be more or less adulterated, if they pretended to an antiquity beyond the era of the introduction of Christianity. Applying this rule to the poems of Ossian, whether those translated or paraphrased by McPherson, or such as have been handed down by oral tradition without his name, we discover words of Latin origin, which, had they been of the ages of Ossian, whose heroes are always represented as heathens, would not have been the case. We find, for example, such words as shield, sword, arms, gold, and silver, of Latin origin; but, above all, the names of the numerals from an unit up to a thousand, a class of words here of a compass not likely to exist in the language of a people so rude as must have been the Irish and Caledonians of the time ascribed to Ossian. That the poems of Ossian are spurious is one thing. There cannot be much doubt about the matter; but that the Latin words in these poems may have found their way into the Gaelic languages prior to the introduction of Christianity, does not seem at all unreasonable, and may be accounted for without any great difficulty. Let us see what our author says on the etymology of local names." He derives *Armorica* from two words common to the Gaelic and Welsh languages: viz., from *ard*, a height or high, and *muir*, the sea; or more probably, *mor*, great or extensive." But, taking into consideration the peninsular character of this part of France, the common etymology from *ar-mor*, "upon the sea," would seem to be the most reasonable. In like manner, *Muirar*, the native name of the province of Moray, in Scotland, is doubtless an inverse, from the Gaelic *muir-ar*; whilst *Pomerania* in Prussia has been very reasonably derived from the Slavonic *po-mor*, "upon the sea." We are told that "the etymology of the word *Wales*, which the French write *Galles*, is unknown, unless it be a corruption of the Roman word *Galli*." It is clear enough that *Wales* and *Galles* are the same word. The Anglo-Saxon has *Walas*, the Welsh, Britons; *Walli*, Britannia; *wealh* (pl. *wealhas*), a foreigner, stranger, one from another country, a Welshman, Welsh. The old German has *Gal*, *Gall*, *Wall*, *Wale*, *Weale*, *Walah*, a stranger, a Gaul, a Roman; *Walcholant*, Gaul; the modern German, *Welscher*, an Italian; *Welschland*, Italy. The Med. Latin *Wallus*, *Gualus*, *Gaul*; all which words are, without doubt, derived, with the aid of the prefixes *g* and *w*, from the old German *al*, *el*, strange, foreign; from

the Latin *alios*. Hence the Alamanni, who gave their name to Allemagne, *i.e.*, Germany, were called. There was also a Gaulish tribe called the Allobroges, who would seem to have derived the first part of their name from the same source.\*

Mr. Crawfurd says "of the etymology of the word Britannia, employed by the Romans, there is certainly no certain knowledge. Some have derived it from the Prydain of the Welsh or the Bhreatunn of the Irish, but I think it far more likely that both these words are corruptions of the Latin word Britannia." This is not at all probable. The word Britannia, in Latin, means nothing at all; and is merely the latinized form of the original name of the country. The etymologies of the name Britain are legion; but perhaps the most reasonable is that from *bret inn*, "high island." Mr. Crawfurd is of opinion that the appellations of all great countries have been bestowed by strangers more civilized than their own inhabitants, and that the names of Italy, Spain, and Germany are examples in Europe; and India and China in Asia, to say nothing of the great geographical divisions, Europe, Asia, Africa, America, and Australia. Perhaps the author of the paper is right, although he has not proved it by *all* the examples which he has given. Further, whatever may be the European designation, it will be found to have been formed in many instances from a native word. Mr. Crawfurd concludes, "If the facts and arguments adduced in the course of this paper are valid, the languages which are its subject are two distinct and separate tongues. Bede, indeed, seven centuries ago, pronounced the Welsh and Irish to be as different from each other as Latin and Saxon. So far, then, as language can be considered a test of race, and to the extent that one European race of man differs from another, the parties speaking the two languages must be viewed as distinct original races." It remains to be seen whether by the facts and arguments which have been adduced, Mr. Crawfurd has proved his case.

To conclude: notwithstanding that a large amount of matter has been brought together in a small space, I am disposed to think that Mr. Crawfurd's paper is illogical and inconclusive; and that it is totally unworthy of the author of the very able dissertation on the Malay language.

\* Allobroges, pop. Gallie Narbonesis, sic dictus, quod ex alio agro translatus esset. Vetus Scholiastes ad Sat. 8, Juvenalis: *Allobrogæ Galli sunt. Ideo autem dicti ALLOBROGÆ, quoniam BROGÆ Galli agrum dicunt, ALLA autem aliud. Dicti igitur, quia ex alio loco fuerant translati.* WACHTER.

## ADDENDUM.

*Personal Recriminations in Section D.* The following discussion, though having no reference to the subject matter of the paper, took place in Section D, after Mr. Carter Blake's paper on "Syndactyly in Man and Apes" had been read.

Professor ROLLESTON said he really had no remarks to make upon the paper which had just been read; but there was one thing that he would wish to lay before the Section, in order that they might see that the Sub-Section of Zoology had not been idle. When he heard that a paper was going to be read upon the hands and feet of apes, it struck him that Section D was not wanting in its duty; and a statement having been made, and having received—from causes which he would not specify—a large amount of circulation, it occurred to him that this paper might have some reference to the difference which that statement alluded to between the foot of the anthropoid ape and the foot of man. He thought that the propositions laid down by a gentleman in whom Newcastle had not realized the proverb that a prophet had no honour in his own country, might be going to be controverted; and under these circumstances, Dr. Embleton, another Northumbrian, and himself had thought it their duty to facilitate the proceedings of this Section by bringing forward the arguments and authorities that could bear upon the subject. They did not consider that the question was one to be settled by rhetoric, and so they set to work, and, as the result of four hours labour, they had prepared a comparison of the foot and hand of the ape with the foot and hand of the human subject. His business for six months in the year was demonstrator of anatomy; and he should be glad if any one who took an interest in the question would call upon him in Subsection D, to act as a demonstrator of anatomy upon this subject, and he had no doubt of being able to remove any doubts that might exist upon it.

The PRESIDENT thought their thanks were due to the President and members of the Sub-Section for their visit, and also for the valuable papers which that department had contributed to the Association. He should be glad, and he had no doubt it would give great satisfaction to all who were present, if Professor Rolleston would at once make the statement to which he had alluded.

Professor ROLLESTON said, if he thought that what he had to say was worth very much, he should not have acceded to that request, because, though not a Newcastle man, he was quite north countryman enough to know that there was nothing like standing by old friends; and, therefore, when he had had anything good to communicate, he had always taken it to Sub-Section D. A statement appearing in a journal of large circulation and popularity must have weight in the proceedings of an assembly like the British Association, which itself possessed popular elements; and every now and then, in such periodicals, statements did find place that astonished men of science, and misled persons who had no claim to that title. A statement of this kind, to which he wished now to refer, asserted that every naturalist

knew that the muscle that bound the great toe was, in the ape, also a flexor or bender of the other toes ; whereas, in the human foot, it was a single muscle, the effect of which was illustrated in the pirouette of the dancer. So far from every anatomist knowing this to be the case, every anatomist could contradict it. There was no single work, ancient or modern, upon anatomy, which could give authority for such a statement. Henle, one of the best of the old authorities, so far from saying that the great toe of a human being had only one flexor, represented the muscle as sending out its branches to two other toes also. And every competent anatomist would deny the opinion which the writer of the article in question attributed to them all. There were several in that room who would confirm his words—who, with him, had taken the trouble to examine the question ; and they would be happy to show to any one the results at which they had arrived. His fellow-countryman Mr. Church, who had written one of the best papers upon the muscles, was in the room, and no doubt his word would be taken ; but, if it would not, no one would question the authority of Dr. Embleton, who was also present and ready to confirm what he (Professor Rolleston) stated. A broad and sweeping statement was made, and the world was informed, *ex cathedra*, in a periodical of great circulation, that every anatomist was acquainted with the fact mentioned. He appealed to those gentlemen whom he had named, and also to Mr. Turner and Dr. Cleland, to say whether the statement was correct.

Mr. TURNER could confirm in every respect what Dr. Rolleston had said. There did exist in the human foot a connection between the flexor muscle of the great toe and the other toes, and that connection was the rule and not the exception.

Dr. JAMES HUNT wished to ask Professor Rolleston whether he had any objection to name the "journal of large circulation" in which the statement occurred. If that were done, they would then be in a better position to discuss the matter.

Professor ROLLESTON scarcely thought that the gentleman who put the question could be ignorant of the name of the journal, but would state at once that it was the *Edinburgh Review*.

Mr. BLAKE, in order that the question might be adequately considered, would suggest that the *Edinburgh Review* of April last should be placed upon the table, and the passage in question read at full length. He thought the references in the way in which it had been mentioned, to an article published in accordance with all literary ethics, were calculated much to complicate the subject by the introduction of personal and irrelevant controversy. The customs which usually governed these literary publications prevented the avowal or the disavowal of the review in question ; but he might request that the whole of the passage might be read, and further, that certain of the passages in the same publication upon analogous subjects might be read also.

Dr. E. PERCEVAL WRIGHT wished to say a word, in confirmation of the statements of Dr. Rolleston and Dr. Turner. During the last two winters he had taken every opportunity of examining this point,

and in no one instance was he fortunate enough to discover a single exception to what he was inclined to believe was the normal anatomy of this muscle. He had likewise talked over this subject with his friend Professor Hyrtl, of Vienna, whose opportunities for prosecuting the study of human anatomy were immense, and the exceptions to the ordinary state of things found by him were very rare indeed, so that it would appear that the author of the statement in the review in question had mistaken some popular statement for a scientific though easily acquired fact.

Dr. CLELAND could also confirm, so far as his knowledge went, the statement of Professor Rolleston.

Mr. BLAKE said he should be glad to have the statement shown to him in the article in question, in which *simpliciter* it was declared that the insertion of this muscle in the great toe was unaccompanied by any further diversion of it. All that was there stated was, that the force concentrated upon the great toe.

Mr. CHURCH thought that an allusion had been made to his paper. He might be excused for making an observation. It was stated in the review, in reference to this muscle, that in the foot of the various wild nations, and particularly in climbers of trees, it showed more deflection generally. He had tried to find out the differences which the muscles in the human form showed, and though he had had the advantage of the Bodleian and the Radcliffe libraries, he had been unable to find any anatomical account of the wild races of man, in reference to the foot: and he should be glad to know where such accounts were to be found.

Professor ROLLESTON might perhaps be allowed to hint that the discussion had gone quite far enough. The article contained the words, this "solitary tendon passes along the sole of the foot," &c., and after stating the position it occupied with regard to the great toe, proceeded to compare it with that in the foot of the orang-outang which possessed three tendons, so that there could be no question as to the construction which the words bore. On a question of this kind authorities were better than rhetoric, assertions, or opinions, and to authorities he had therefore confined himself.

Mr. BLAKE believed the words "solitary tendon" as the reviewer had used them were strictly correct. By the assertion that one solitary tendon passed along the sole of the foot he was not aware that by any logical construction was conveyed a denial of the fact that before the muscle sent forth its greatest slips, other divergent slips may not be sent forth, and in no passage had the presence of those divergent slips which Mr. Church and Mr. Turner had pointed out been denied. He must complain that such unfair stress should be laid upon the passage, that its meaning should be thus warped, that the logical signification of the words should be, he hoped unintentionally, misrepresented, and that dust should be thus thrown in the eyes of zoologists, as had been done in the theatre of Albemarle Street. He was certain that his anatomical brethren would give the writer of the passage in question credit for having offered a fair and true explanation of the broad differences between the foot of the ape

and the foot of a human being, and the best explanation he could have given to a general audience. The broad question was left just as it was—the whole force of the long flexor in the man was concentrated upon the great toe; but a different condition prevailed in the apes, the force of the long flexor being in their case divided amongst several toes. He was unprepared for a discussion of the myology of apes arising upon a question of their integument, and the subject seemed to have travelled far beyond the record.

The PRESIDENT (Professor Balfour) observed that the question had reference only to the tendon, and reading the passage in the review in the ordinary sense, they had a solitary tendon in the one case, contrasted with three tendons in the other, so that it seemed Professor Rolleston was justified in the construction he put upon the words.

Dr. EMBLETON said he had at one time entertained the belief that that which Mr. Blake had stated was the general rule; but on referring to old authorities as well as to the more recent works upon the subject, he found that the cases where there was a single tendon only attached to the long flexor were the exceptions only.

Dr. CLELAND said the dispute narrowed itself very much to this:—Mr. Blake found fault with the article being treated unfairly; but the force of the reviewer's arguments appeared to be that whereas in the monkey there were three tendons going to three different toes, in the human being the force was concentrated upon the great toe only. The fact was, that the tendon was connected not merely with the great toe, but with all the other toes also, and exercised its pressure upon one as well as upon the other, so that it could not logically be said that the force of the muscle was concentrated upon the great toe.

Professor ROLLESTON wished, before the discussion closed, to ask whether it was not the duty of the president of a section to call attention to such statements, bearing upon his department, as appeared in journals of scientific pretensions? He had thought it his duty, in the sub-section over which he presided, to draw the attention of those who attended the section to statements that were growing current in the periodical literature of the present day. He had taken pains to make himself master of such subjects as came before the section, and to acquaint himself with the popular as well as scientific literature in reference to them, and in that way he had referred to the article in the *Edinburgh Review*.

The PRESIDENT (Professor Balfour) considered that Professor Rolleston had done quite right in calling attention to this matter. It was a great advantage for subjects of this kind to be brought forward and discussed, and he had no doubt that Mr. Blake would agree with him in that opinion.

Mr. BLAKE admitted that Dr. Cleland had very well put the case, and if the word "concentration" was objected to, he would say the greatest power of the muscle was used on the great toe, or employ any analogous word; there was the greatest portion of the power directed upon the great toe in a human being, and there were also divergent slips the existence of which the reviewer did not deny, while, with respect to apes, the force was diverted to several toes. He could

only express his gratification at the way in which this discussion had been carried on by Dr. Cleland, Mr. Turner, Mr. Church, and Dr. Embleton, and expressed himself entirely in accordance with the anatomical facts, as well as the interpretation of the reviewers' version of these facts which these gentlemen had that day promulgated. He wished also to take that opportunity of expressing the very great pleasure he felt on reading the very able paper on the Chimpanzee by Dr. Embleton; and so long as they had scientific facts of this nature, met, as they always ought to be, in a fair spirit, unaccompanied by garbled versions of writers' statements, he should always consider himself proud to enter the lists with such learned anatomists as Dr. Embleton, Mr. Turner, Dr. Cleland, and Mr. Church.

Dr. DAVY did not see how the gentleman who had just spoken could with any justice assert that garbled versions had been brought before the section, seeing that the passages which Mr. Blake desired to be read were read both by the gentleman himself and by Professor Rolleston. He trusted, therefore, that the offensive expression would be withdrawn.

Mr. BLAKE would willingly withdraw the word, if it was offensive to the section, and say that the construction put upon the article by Professor Rolleston was certainly not that which the writer wished to convey.

Here for the present we must conclude our notice of the proceedings of the Association. We have not reported a paper read by Mr. Richard Lee, on the extinction of races, which is of the less importance, as no discussion took place on his paper, and we understand it will ere long be read before the Anthropological Society of London. We shall then be able to present it to our readers at our next issue. We shall speak of Captain Grant's paper, on noticing the forthcoming work by Messrs. Speke and Grant. We can find nothing in Mr. Craft's paper on "Dahomey" which is worth printing. The object of the paper seemed to be to throw discredit on the account which had been sent to this country by M. Jules Gérard; but it was evident that most of the revolting scenes described by that traveller were admitted to exist by Mr. Craft. He, however, denied that they were so revolting. It is very significant that M. Jules Gérard, in his letter to the Duke of Wellington, should have said so markedly, that he was sorry Captain Burton was not present to confirm what he asserted. Mr. Craft was present with M. Jules Gérard, and it is not a little ominous that this traveller never refers to Mr. Craft as a witness. We are sorry to hear that Sir Roderick Murchison at once accepted Mr. Craft's account as correct, and even went so far as to say that "M. Gérard had probably indulged a little in imagination from, the desire to render the description of his journey as graphic as possible."

We hope this assertion was made in the heat of debate, and not as intentionally throwing discredit on the veracity of M. Jules Gérard, who, being in a foreign country, was unable to reply to the attacks made against him in his absence. Let us have patience and hear both sides of the question, before we condemn a traveller, and a foreigner, in this wholesale manner. In the meantime we would suggest to Sir R. Murchison, and to anthropologists generally, whether they do not think that much of the difference in the accounts of the two witnesses may be explained by the two travellers having different "instincts"? Mr. Craft has a certain amount of African blood in his veins, and this must influence his innate ideas. We can, therefore, readily understand that scenes which would be very horrible to M. Jules Gérard, would not appear in such hideous colours to a Mulatto, like Mr. William Craft. While on the subject of half-breeds, we should mention some interesting episodes respecting Mr. Craft, who was put forward as a "pure Negro," and continually described and spoken of as a "fine specimen of his race." What race? we asked, but could get no reply. In the *Journal of the Association* he was described as "an African Gentleman." But Dr. Philip Carpenter objected to this, and in a letter to the President said, "Mr. Craft is not an African but an American gentleman, having been born in the Southern States of America." Mr. Craft then cleared up the confusion of ideas as to his race, by saying, "he considered himself an Englishman of African parentage, unfortunately born in America." But this is not quite satisfactory, as Mr. Craft knows himself that one of his parents is a Euro-American, and the other he has never alleged to be of really pure African blood.

This episode well represents the confusion which exists respecting the terminology of anthropological science, and we hope that the promised Report of the Anthropological Society on this subject will soon be issued, that some of this confusion may be removed. We cannot conclude our report without expressing our thanks to the local newspapers of Newcastle for the admirable manner in which the sectional meetings were reprinted, especially in the *Newcastle Chronicle*.

It was not without regret that we looked in vain for the face of the man who has been the Chief Secretary of Section E for many years—we allude to Dr. Norton Shaw. We presume the President forgot to allude to the loss the Section had sustained in no longer having that intelligent, able, and courteous geographer to act as Secretary. We also noticed that the two other Secretaries who have acted with Dr. Shaw for some years past did not act this year.

Mr. C. R. Markham has taken Dr. Shaw's place, and Mr. Carter Blake the place of Dr. Hunt. Mr. Thomas Wright was prevented by other engagements from attending the meeting this year. Mr. Crawford was present, fighting his battles with all comers, as of old. We venture to say that there is no man who attends the meetings of the Association who has had more fighting than this venerable member, and there is evidently no one who so thoroughly enjoys asking his friends "to tread on the tail of his coat." His opinions on all ethnological subjects are just as they were forty years ago, at which time Mr. Crawford, to his lasting honour, was one of the first to raise his voice against the stereotyped popular ideas which then existed respecting man's past history. We trust he may long be spared to attend the Association, and we feel sure that none will more heartily join in this wish than those who are most opposed to his scientific teaching and his antiprogressive ideas. We can scarcely ask of a hard-headed Scotchman of eighty years of age that he shall advance with the times; but we hope, for his own reputation, that Mr. Crawford will not, in his maturer years, help to arrest the cause of scientific truth, of which he has been so brave a champion during the last fifty years. We heartily coincide with Mr. Crawford's remarks on proposing a vote of thanks to the President, when he said, "Nature evidently intended Sir Roderick Murchison to be a President. He combined in the most happy proportions firmness and amenity, and always made the meetings over which he presided pleasant and profitable."

Before we conclude our report, we feel it our duty to express our earnest desire that Section E may long be spared that painful exhibition of personal animus which has, during the last few years, been introduced into the discussions of Section D. It will, perhaps, hardly be believed when we state the fact that, on a paper being read by Mr. Carter Blake, in Section D, on "Syndactyly in Man and Apes," a member of the Association was allowed to get up and make a long tirade against the writer of some anonymous article in the *Edinburgh Review* of April last. Not a word of discussion took place on Mr. Blake's paper, but the time of the Section was taken up by listening to Dr. Rolleston's grievances against this anonymous writer. We were glad, however, to hear the severe castigation which Mr. Blake administered to him, and which will, we trust, make him more cautious not to attack again in debate one who is evidently so much his superior.

Section E was much indebted to Professor Daniel Wilson, of

Toronto, for many excellent speeches. We are glad also to be able to find a full and original report of the excellent speech on Archaeology made by Mr. George Tate, the well-known antiquary and geologist, and active Secretary of the Berwickshire Naturalists' Field Club. To the character of the speeches generally we will quote the words of the esteemed President, who said, "I have been a member of the Association from its foundation, and I must say that I never presided on any occasion on which there have been such numerous audiences, and so many admirable discussions. I may add, that I have never presided on any occasion on which I have seen so much good feeling exhibited, not only by persons around me on this platform, but by all those who have taken part in the proceedings." These were Sir R. Murchison's parting words to the Section, and we must now close our report. The Association has sustained a very severe loss in being deprived of the valuable services of Professor Phillips, who has from the commencement of the Association been its most energetic and able manager. A universal feeling of regret is felt throughout the Association at his loss. We hope he may long live to enjoy his well-earned popularity, and that his example will be the means of inducing his successors to follow in his disinterested and impartial footsteps. We believe that universal satisfaction is felt at the selection of Sir Charles Lyell as President for the ensuing year. Anthropologists have especial reason to be satisfied, for no one has of late years done more for the progress of Anthropological science than Sir Charles Lyell. We were glad to see him in Section E this year, and hope that for the future we shall see him far oftener. Everything bids fair to make the next meeting at Bath successful. We trust that during the time that will elapse before the meeting, Anthropologists will bestir themselves to bring all their forces together, and thus help to secure the formal recognition of Anthropological science by the Association. We understand that notice has been given by Dr. Hunt, that Section E shall for the future be devoted to "Geography, Ethnology, and Anthropology." A general rumour prevailed that there was to be a sub-section especially devoted to Anthropology. We think, however, that an increase of the number of sections is objectionable, and we see no necessity for such a division. As an independent journal, devoted to Anthropological science, we shall feel it our duty to advocate a union of Anthropology with the present Geographical and Ethnological section.

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## WAITZ'S INTRODUCTION TO ANTHROPOLOGY.

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ONLY a few months have elapsed since the Anthropological Society of London announced that they intended publishing a translation of the first volume of "Waitz's Anthropology of Primitive Peoples," and now, just as we go to press, the volume is issued to the Fellows. We shall only be able to give a short outline of the first impression which the work has made on us. In the first place, we must say that the rapid manner in which the book has been produced is most creditable to the Society, and especially to the editor, Mr. Collingwood. We hope this good example will be followed by other editors of works which are announced to be published by the Society. The Anthropological Society, if they had done nothing else, and should now cease their labours, would have effected very much for Anthropological science. Therefore, for the first time in the history of British scientific literature, we have a compendium of modern Anthropological science. It is almost enough to shame our national pride to think that such a work should not come from one of our own countrymen; and yet, with all the merits of this work, we still see that a German alone could have written it. Its very value for anthropological students consists in its defects. Many will take the book up and ask, "Is the author a Monogenist or a Polygenist?" But, we are glad to say, they will have to read the book before they will get their curiosity gratified. Nothing will help to do away more effectually with that shallow school of thought, which makes all science relating to man resolve itself into a solution of the problem of man's origin. This volume will help to put the science of Anthropology in a proper light before the scientific men of this country. It is a matter of amazement to find that the science of Anthropology is only just receiving a recognition from men of science. We may not agree entirely with the exact position which he assigns to Anthropology, but we cordially endorse his statement that "it is requisite to declare in this place, once for all, that Anthropology is to be considered as an empirical science, because its subject, *Man*, is only known to us empirically, and hence it is requisite to study man by the same method which is applied to the investigation of all other natural objects."

The author has traced the gradual rise of Anthropological science, and the different meanings which have been attached to Anthropology, and very properly limits the sphere of this science, and shows

that it has a positive existence as a science, and is not merely a collection of borrowed materials. Much, however, of the author's introduction will be too metaphysical for the English mind. The great fact remains, however, that the author divides Anthropology into four great objects; the first being Man considered from an anatomical and physiological standpoint; the second, in his psychological aspects; the third, in his social and historical aspects; and the fourth, treating man, under his ethnological aspect, as composed of races. The volume before us is divided into two parts; first, the physical, and, secondly, the psychological. The first part embraces a general introduction to the physical investigation, in which the signification of species is fully and clearly discussed. Then comes section the first of the physical investigation "on the mode and magnitude of the physical changes to which man is subject," occupying about seventy pages. Section two consists of a dissertation on "the chief anatomical and physiological differences which exist in the various races," with an Appendix "on the asserted inviability of the Americans, Polynesians, and Australians." Section three is on "the results of intermixture of different types and the peculiarities of mongrels." Section four consists of a "review of the principal theories regarding the unity of mankind." Section five treats of the "classification of mankind." Then comes the second part of the book, divided into three sections; first, the specific characters of man; secondly, the natural state of man; and thirdly, the various states of civilization, and the chief conditions of their development, followed by a general recapitulation. Such are the contents of this volume, which forms a complete introduction to the present state of Anthropological science. There are but few men living who are qualified to have undertaken such a vast inquiry. The author very modestly observes:—

"I had from the beginning no hope of arriving at a perfect solution of a question which it were desirable should be treated by the united powers of the zoologist and geologist, the linguist, historian, and psychologist. But as such a happy combination may be long in occurring, there remained but the alternative either to leave the question in abeyance, or to try its solution with insufficient means."

There is one thing which will render this book specially valuable to the English student, and that is the admirable manner in which Professor Waitz has quoted the authorities for his statements. He is not content with giving the name of the author, but the title of the work, the page on which the statement occurs, and the year in which it was published. These authorities are very voluminous, and evince

the labour which the author has bestowed upon his work. It must have been not only a labour of love, but the work of many years systematic reading, to accomplish such a task. We are sure that the rising generation of anthropologists will heartily thank the author for his labour, and the Anthropological Society for its boldness in undertaking the responsibility of producing such a work. Nor has the editing of this volume been a slight task, and as far as we are yet able to judge Mr. Collingwood has been most careful to render the work readable, and must have taken great pains with his work. The Index which he has added greatly increases the value of the volume. We shall speak of his introduction, and of the general manner in which he has accomplished his task at a later period, when we shall continue our notice of this volume. For the present we must content ourselves with making a few general remarks on the first sections of the book.

We are glad to see that the author has again called attention to the confusion which Prichard and others introduced into the science, by considering unity of descent and unity of species to be convertible terms. He says: "We shall therefore adopt the first proposition that unity of species results from proved unity of origin; but not the second, which has often by zoologists been considered as inseparable from it, namely, that separate descent, wherever it can be traced, is a sufficient proof of difference of species."

Waitz criticises, we think justly, Dr. Nott's statement, that "every animal, from man to the worm, is governed by special physiological laws." No doubt Blumenbach and others have carried their analogies between the laws regulating man and animals too far; but it is unphilosophical to assume that which has yet to be proved, that man is not governed by absolutely the same physiological laws. On the contrary, we are justified in assuming that the same laws regulate all organic life; and there is the best reason to suppose that there is but one great system of organic development, and that the physiology of animal life is the same in principle, but with an endless diversity in its application. Nott also says: "The rules current among breeders of domestic animals have been considered as applicable to man, but the notion itself is very unphilosophical, and could never have originated with any intelligent naturalist of thorough experience."

Here is a difficulty meriting the serious attention of anthropologists at the very threshold of their science. We shall be glad to see this subject taken up in a really fair and candid spirit. We are fully

conscious of the vast difficulty surrounding such an inquiry, because it would necessitate a series of experiments as to the influence of aliments and other physical agents on the different races of man, as well as on animals. It is not a little remarkable that the lamented and philosophical anatomist, Robert Knox, was also of Dr. Nott's opinion, and continually protested against the application of the laws regulating plants and animals to the physiology of man. We may, indeed, nearly surmise that it was from the writings of Knox that Nott received the idea. The subject is open to discussion, inasmuch as there are some curious facts and inconsistencies which have never yet been explained. The author very properly observes :—

“The investigation of the unity of mankind as a species can only be finally completed when the results of long continued influences of all possible external conditions in which man is able to live are as fully and clearly ascertained, as the results of all possible crossings of various human types after a long series of generations. But as our experience in this respect is very far from being perfect, we are compelled to stop at some more or less probable propositions, which must proceed from the solution of the question, whether a gradual alteration of types belonging to the same stock can be proved, and whether it be sufficiently extensive in order to show that the greatest differences prevailing among mankind are merely variations.”

The whole spirit of the work seems to be due to the natural revulsion of feeling with which the author regards the statements which have recently been advanced in the most dogmatic manner respecting the proofs of the diversity of man's origin. The author takes the other side, more apparently to show the fallacy of such reasoners, than because he is opposed to their views. Dr. Waitz is avowedly an advocate for unity of species, if not of descent, and we shall therefore dwell more especially on some of the difficulties of which the author is himself conscious in reconciling known facts with the theory of unity of origin.

In the first place, he treats of the influence of climate on man, and the result is, that he can deduce no generalization which will meet all the presumed facts we have at hand. It might have been reasonably supposed that, after so many observations had been made, we should be enabled to make some generalization which would meet the facts; as, for instance, that the dwellers on mountains and hilly districts are lighter in complexion than those in the valleys. The author is induced to think that the evidence will support this theory; but admits that the facts are not free from contradiction, and says, “It is difficult to admit that the browning of the skin in our

climate in summer is produced by the same causes as the black colour of the Negro, and that it would only require a greater intensity and a longer duration to become so entirely." He equally objects, in the cases of dark spots, which occasionally occur in lying-in-women, that this diversity is attributable to the influence of diet; nor can he subscribe to Volney's theory of the influence of light and heat in producing the overhanging eyebrows, half closed eyelids, raised cheeks, and projecting jaws of the Negro. He also admits that it is proved that the diversity amongst mankind does not depend alone on geographical latitude and mean temperature. At page 41 he quotes a goodly list of instances to prove this. He then says, "the colour of the skin is not so much owing to climate as to descent" (p. 42). But this is just the very argument of the opposite school. Yet ten pages afterwards he says, "Colour, like many other physical peculiarities, depends partly on local conditions besides geographical latitude." And yet he can produce no local conditions by which he can explain these results. At p. 45 he gives several instances to show that the inhabitants of mountains are lighter in colour, and physically and intellectually superior to the inhabitants in the valleys. He points to the assertion frequently made, that it is heat combined with moisture which produces the dark skin; but Tschudi expressly says, the colder the climate the darker the colour. D'Orbigny also says that a hot and moist climate, with sufficient protection, is favourable to whiteness of the skin. The author quotes the case of the Portuguese settlers in the west coast of Africa being transformed into black mulattoes; but here is no influence of climate, but simply the result of intermixture. It would be well if future writers on this subject took a little more pains to inquire whether settlers of this sort took any women with them. He quotes Raffeneil to show "that there are well authenticated instances of pure Arabs who had become darker than those accounted very dark among Negroes." Will Captain Burton kindly supply us with some of these instances?

The author quotes from Stanhope Smith as to the influence of climate on the Europeans in America, and notwithstanding the protest of Knox, Nott, Broca, Crawford, and others, we are bound to say all recent authorities have tended to confirm the fact that some influence changes the European in America. The personal observations on this subject of Desor, Pruner-Bey, and Berthold Seemann are most valuable and suggestive. The author says,—

"Beside, the leanness, the stiff shaggy hair are also characteristics of the American; the curly hair of the European becomes straight

in America (Jarrold), so that the American is, generally, in caricature, represented with a long neck and long hair. The latter is, in comparison with the soft silky hair of the Englishman, evidently an approach to the American Indian. The long neck is connected with a weaker development of the glandular system, to which must be added the nervous irritability of the American. These peculiarities have been connected with the dry west winds which predominate in the United States; notwithstanding nearly double the quantity of rain which falls there, in comparison with most European countries, drought frequently injures the harvest. Other causes contribute to this change, such as the restless activity of the Yankee, and his love of spirituous liquors. The American is also said to have a voice of less metal, and his eyelids are said to be shorter than those of the European."

In speaking of the inhabitants of the West India Islands, the author mentions the frequently noticed fact that the Negroes there in places of trust have European features, and instead of allowing, as is well known, that this is simply the result of intermixture with Europeans, he says, these facts "at least show that the bodily formation of the Negro has not that absolute permanence which some would ascribe to it; and though one might be inclined to confine their change of type within narrower limits than higher races, those who, like Nott, deny any change of the Negro in America, are evidently in the wrong."

Now, here we have a case in point, and Dr. Nott may feel that his position is perfectly tenable if no better instance can be brought against his teaching. Dr. Nott admits that the Negroes are improved in America from their intimate contact with a superior race. The author quotes Stanhope Smith's assertion, that "in New Jersey especially there are Negroes to be found with straight noses, well-formed foreheads, and straight incisors;" he continues: "These instances, although they may not be considered as *perfectly impartial observations*, are too numerous, too definite, and too free from any suspicion as to their sources, to be rejected off hand." We fear, however, that we must pronounce them either as most impartial observations, or else the result of ignorance on the subject. Nor can we agree with the author that these statements are "definite," for they appear to us to be of the vaguest nature, and totally unworthy of record in any scientific work.

The part of the work which treats of what the author calls the "spontaneous origin of new peculiarities," is of great interest as recording the opinions of different writers on the question of transmission of acquired mental and physical peculiarities. The author believes that, under favourable circumstances, some mental character-

istics are transmitted, and that this might contribute to an explanation of the differences existing in the physical organization of mankind. The whole of this part of the book is very speculative, and the author can find but few facts to support his theory. It is chiefly reasoning on analogy as to what is effected in the lower mammalia; but at the same time he contends we do not require the analogy, as we have the hereditary transmission of peculiarities in the human subject proved in very many cases. The conclusion to which the author arrives on the influence of physical agents is given in the following words:—

“The assertion that the physical type possessed by the respective races remains entirely permanent is erroneous; it is only as to the limits of certain changes that doubts exist. It is impossible to determine the exact influence of each individual agent, or to point out its limits. The theory which has most in its favour is, that mental culture possesses the greatest influence, climatic conditions alone have the least, diet and mode of life hold an intermediate place. Finally, the spontaneous origin and transmission of new qualities appear among the most influential agents in the production of differences among mankind.”

The chapter “on the anatomical and physiological differences which distinguish the various races” is not so good as the first section. He says that the assertion of Messrs. Nott and Gliddon, that the Bushmen as nearly approach the orang-utan as they do the Europeans “are shameless exaggerations.” After treating of the physical organization of the Negro, he concludes by saying, “it cannot be doubted that there is a certain resemblance between the Negro and the ape, although the distance between them is sufficiently great to discard any idea of their relationship.” We confess ourselves not to be able to understand the meaning which the author attaches to the word “relationship.” After dwelling on the physical characteristics of the Negro, a subject which we hope to hear fully and freely discussed at an early meeting of the Anthropological Society, he adds, “It cannot be our intention to deny by these remarks the greater resemblance of the Negro to the ape in comparison with the European, but simply to point out that the resemblance has been greatly exaggerated.” We merely point to this chapter that the reader may see the opinions of the different authorities which the author has quoted on this subject.

Here, for the present, we must conclude our notice. We feel that we shall be rendering more service to the science of Anthropology by dwelling on the different parts of this work than by hur-

riedly passing over some important matter. Whatever faults we may have to find with the work, we feel sure that its publication marks an epoch in the study of Anthropology in this country. No longer will anthropologists be obliged to confess that they have no text-book for their science; but they can now say to the inquirer, "read and study Waitz's Introduction to Anthropology, as you will learn all that science yet has to reveal."

(To be continued.)

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### KINGSLEY'S WATER BABIES.\*

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IN these days, when Anthropology seems to be reviving from the prolonged torpor in which it has placidly rested since the time of the publication of the sedative works of Prichard, while the great doctrine of the subordination of the actions of each individual, his birth, his life, and his death, to the operation of uniform dynamical laws which govern the entirety of external nature, is now receiving universal acceptance, the publication of the above work marks the period of an epoch in our biological literature.

Great changes in the thoughts of mankind have often been distinguished by the publication of poetical or satirical effusions. Since the time when Aristophanes satirized the nascent biological truths which were then scarce yet cropping out amongst the thoughts of Hellenic inquirers, and ignorantly confused them with Socratic speculations; since the time when the painters of the Egyptian papyri, often, in the exercise of their sportive skill, depicted the various known animals in ridiculous or ludicrous positions; since the time when the beetle-hunter and butterfly-preserver of Pope's *Dunciad* were regarded as beings beneath the notice of the poet or the reciter of "smart things;" down to the period when authors who profess to investigate the history of England sneer at the "most intense study of entomology" as something almost incompatible with the attainment of correct information, exalted ideas, or noble sentiments, great changes

\* The Water Babies; a Fairy Tale for a Land Baby. By the Rev. Charles Kingsley, F.L.S., F.G.S., Honorary Fellow of the Anthropological Society of London, and Professor of Modern History in the University of Cambridge. 8vo. London and Cambridge: Macmillan. 1863.

have taken place in the world's thoughts. We have to deal at the present time with the advocates of the inductive method, with the disciples of a philosophy founded on the observance of the constancy of the laws of nature, and consonant with, if it may not be directing, the cause of the state of European science at the present time. To those who may wish to emulate the reputation of some of those quasi-scientific writers, who have no notion of any more lofty conception of the science of life than the inspection of a series of disconnected objects, each exhibiting "evidences of design," and nothing more, and who are characterized by the lines which have been applied or misapplied to the poet Göthe:—

" The lessons he taught mankind were few,  
And none that could make them good or true,"

to those who regard the whole universe as subordinated to man, who creates the laws by which the inferior beings live or die; or to those who may, while they thoroughly comprehend the systematic and classificatory productions of zoology, be wholly ignorant of the great conclusions to which the conception of such system and classification leads us, Professor Kingsley's "Water Babies" will open a new vista of contemplation wholly at variance with the habitual and unrefreshing thoughts which may have left feeble impressions on their plastic minds.

The style of the work is throughout in pure English—such English as Kingsley always writes—clear, manly, and to the point. In this it may fairly bear comparison with any of Professor Kingsley's previous publications. The superficial reader will merely be struck with the flashes of wit and humour which are scattered throughout the book; the "land babies," for which it is ostensibly destined, must, however, attain a competent knowledge of biological controversy before they can hope to comprehend it, while the disciples of the false philosophies which it satirizes, will hardly relish the castigation administered. The description of such remedial agents as life-pills, homœopathy, mesmerism, pure bosh, the distilled liquor of addle eggs; "antipathy, or using the subject like a man and a brother; apathy, or doing nothing at all; with all other ipathies and opathies which Noodle has invented, and Foodle tried, since black fellows chipped flints at Abbeville, which is a considerable time ago, to judge by the Great Exhibition," should be carefully read and studied by those medical practitioners who may feel disposed to commence a heterodox practice. The pure anthropologist has, however, more interesting matter afforded him. That destructive

school of scientific thinkers who, like the giant in the great land of Hearsay, would smash in the temple of the land for the sake of three obscure species of Podurellæ and a Buddhist bat, the latter cognate with that which is said to be confined to the Buddhist temples of Little Thibet, meet with due notice in the work.

We regret that the exigencies of our space preclude us from the reproduction of the inimitable passage in which Professor Kingsley applies the Darwinian laws to the supposed "degradation" of the ape from the human species. The career of the Doasyoulike nation, whose neglect of the physical laws conditional on their existence reduced them ultimately to gorillas, is no doubt familiar to many of our readers, and upon the supposition, therefore, of their familiarity with the work, we feel bound to point out that the great flaw in the Darwinian theory, which Professor Kingsley, to a certain extent, we believe, advocates, is admirably illustrated in this passage. According to our interpretation, when the Doasyoulikes had once ascended the trees, and the weaker individuals had been all eaten up by the lions, the felines would have had nothing to eat. They would consequently have been hungry, and unless their structure was modified to catch something else—and Professor Kingsley telling us of no other carnivorous or herbivorous animal, upon which to prey—they must, in the long run, have died of inanition. Then, when the lions were all dead, the Doasyoulikes might have safely descended the trees, and the further transmutation of the scansorial man into the ape would have been rendered functionally unnecessary.

Or, we are as much at liberty to suppose plasticity in the organization of the lion as of the man. The organization of the lion being slightly plastic, those individuals with the most powerful claws, and in whom the scapular arch was most mobile, let the difference be ever so small, would be slightly favoured, and would tend to live longer, and to survive during the time of the year when the food was scarcest; they would also rear more young, which would tend to inherit these slight peculiarities. The less scansorial ones would be rigidly destroyed. The consequence would be, that the lions would be transformed into tigers, leopards, or other climbing cats, and would ascend the trees and eat up the men, unless from the *homines* the smaller and lighter individuals were selected, who might have descended along the flexible boughs, as Friday did, when the bear pursued him, and so reached the ground in safety. Then, if there were any terrestrial lions left, the men would stand an equal chance of being devoured; or the scansorial lions might come down at

leisure, modify their organization, and commence the game afresh. The "selective process" would thus bring us precisely to the point whence we started.

Another great feature in Professor Kingsley's work is the extreme liberality with which his scientific opinions are characterized. The contempt which he bestows on the "Cousin Cramchild's arguments" of the anti-scientific school of thinkers, is exemplified by his description of the land of Oldwifesabledom, where the people were not so frightened as they wish to be; the narrative of Tom's journey to the other end of Nowhere, to attain which he was told to "go to Shiny Wall, and through the white gate that never was opened; and then you will come to Peacepool and Mother Carey's haven, where the good whales go when they die;" and his delightfully minute account of the signification of many things "which nobody will ever hear of, at least until the coming of the Cocqicigrues, when man shall be the measure of all things," contain ideas which we must recommend to the attention of every sincere thinker.

Superficial and limited knowledge is especially visited with Professor Kingsley's severe condemnation. The adventures of the old cock-grouse, who "was always fancying that the end of the world was come when anything happened which was further off than the end of his own nose," and on finding an hour afterwards that the end of the world was not quite come, gravely announced that "it was coming the day after to-morrow," justly parallels the words of the far-seeing writer who, a short time ago, regarded the formation of the Anthropological Society as a sign of the "last days."

The finest passage of the work, however, is the plea for possible degradation of mankind into a perennibranchiate amphibian, *i.e.*, a water baby. We must commend the following argument to M. de Castelnau, who advocates the existence of men with tails in Equatorial America:—"No one has a right to say that no water babies exist, till they have seen no water babies existing, which is quite a different thing, mind, from not seeing water babies, and a thing which nobody ever did, or perhaps ever will do." The argument is certainly a fair specimen of reasoning, and would have been accepted in the middle ages, when men reasoned better and knew less than they do now. After Professor Kingsley has exhausted every argument in favour of the existence of water babies, he triumphantly clenches the matter by telling Cousin Cramchild, his adversary, "that if there are no water babies, at least there ought to be; and that at least he cannot answer."

The whole episode relating to Professor Ptthmlnsprts, the chief professor of necrobioneopalæonthydrochthonanthropopithekology, in the new university which the King of the Cannibal Islands has founded, should be perused by every *savant*, especially by every anthropologist. We must pass it over here, as well as many other brilliant passages. Careful perusal, and a thorough scientific education, are preliminaries to the study of this work, which, like the Gargantua of Rabelais, or the Sueños of Quevedo (especially the latter, in Sir Roger l'Estrange's inimitable translation), inculcates lessons of the highest import in language which must gratify every one who has reflected on the generalizations to which modern science has arrived.

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### LUNACY AND PHRENOLOGY.\*

By C. CARTER BLAKE, Esq., F.G.S., F.A.S.L.

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DR. WILLIAM LAUDER LINDSAY, long favourably known as an alienist and as a toxicologist, devoted, in his capacity of physician to James Murray's Asylum for Lunatics, a large proportion of his Annual Report in 1860 to a careful examination of the theories of phrenologists, as tested by the observed cranial development and psychical manifestations of the patients committed to his care. Those who, from previous study of this author's writings, are aware of his sedulous adherence to exactitude, his accuracy of logical deduction, and the wide and prolonged experience which he possesses, will feel no surprise that the work before us is one of the most trenchant and severe attacks on the tenets of phrenologists which has ever appeared. It will, however, we hope, not be our task to wade through the tedious controversy respecting the truth or falsehood of phrenological deductions. Anthropology, in the year 1863, has a more scientific task before it. But a few of the more telling passages of Dr. Lindsay's *brochure* demand our repetition. Before the author proceeds to illustrate, chiefly by means of statistical tables, the bearings of meteorology on psychopathy, *i.e.*, the relationship "between

\* Thirty-Third Annual Report of the Directors of James Murray's Royal Asylum for Lunatics, near Perth, June 1860. 8vo. Perth: 1860.

sudden changes in the phases of insanity and certain atmospheric conditions or changes," he states generally adverse conclusions, derived from his observation of the cognate science of phrenology.

As respects some particular organs, Dr. Lindsay's conclusions are as follows:—

"*Benevolence*.—Table I. shows that it was very large in 5 males; very small in no case; large in 72 cases (41 males and 31 females); small in 46 cases (20 males and 26 females). Table II. shows that, of 4 patients who were characterized by excessive liberality of disposition (3 males and 1 female), this organ was large in all; while in 45 patients, chiefly cases of Chronic Dementia, who were characterized by facility of disposition (29 males and 16 females), it was very large or very small in none; large in 20 cases (14 males and 6 females); and small in 16 cases (10 males and 6 females). Table III. shows that, of the 5 patients in whom it was very large the actual character was confirmatory in only *one*. 'In Insanity, Gall states this organ is manifested by excessive liberality and profusion, and by a desire to give away everything of which the individual is possessed. He observes that, in idiocy, it produces good nature and harmlessness; while, where it is small, and Destructiveness large, the unfortunate is prone to fits of rage, and becomes dangerous. . . He does not detail the evidence on which [his observations] proceed, and does not pretend that the cerebral parts, to whose action he attributes the phenomena, were examined or found diseased [!]. The profusion which he attributes to an over action of Benevolence may proceed from general fatuity, from vanity, from small Acquisitiveness and Cautiousness, joined with general prostration of reflecting intellect; in short, from a *thousand* [!] sources, instead of that on which he founds his *conjectures*. We have the more reason to view, with the utmost distrust, Gall's observations upon this subject, when we find that he designated this organ the seat of the faculty of justice and moral obligation. While he does so, he very coolly details a great variety of facts relating to its function, totally at variance with his leading definition.'—[Smith, p. 149]. Here, again, phrenologists are at issue with a vengeance, and their statements are so confused and contradictory, that it need not detain us to say whether or not our statistics bear any of them out.

"*Individuality*.—Smith very properly mentions, as a caution in estimating the size of this organ, that it is the 'chief seat of the frontal sinus in adults' (p. 186). By external manipulation, how much of the size of the 'organ' to refer to the sinus in question [which varies greatly in thickness and extent], and how much to the 'easily distinguished' convolutions of the brain, which are limited to the manifestation of the phenomena of Individuality, it is for phrenologists, and not for us, to indicate!"

The following abstract is given by Dr. Lindsay of his third Table:—

	Number of Cases.	Character of patient apparently confirmatory.	Evidence opposed.	No sufficient evidence.
1. Amativeness .. .. .	6	4	1	1
2. Philoprogenitiveness .. .. .	40	13	3	24
3. Concentrativeness .. .. .	5	2	2	1
4. Inhabitiveness .. .. .	3	—	2	1
5. Adhesiveness .. .. .	2	2	—	—
6. Destructiveness .. .. .	1	—	1	—
7. Alimentiveness and love of life .. .. .	1	—	—	1
8. Acquisitiveness .. .. .	5	1	—	4
9. Constructiveness .. .. .	2	2	—	—
10. Self-esteem .. .. .	5	2	—	3
11. Love of approbation .. .. .	2	—	—	2
12. Cautiousness .. .. .	5	2	—	3
13. Benevolence .. .. .	5	2	2	1
14. Veneration .. .. .	8	1	—	7
15. Firmness .. .. .	9	—	2	7
16. Wonder .. .. .	1	—	—	1
17. Ideality .. .. .	1	—	—	1
18. Individuality .. .. .	7	4	—	3
19. Locality .. .. .	5	1	—	4
20. Time .. .. .	1	—	—	1
21. Tune .. .. .	2	—	1	1
22. Causality .. .. .	1	—	—	1
Total .. .. .	117	36	14	67
Mean .. .. .	5.32	1.63	0.63	3.04

The fourth Table is "introduced to meet an objection that may possibly be brought against our statistics, viz., that by isolating the particular 'organs,' and giving results depending on their absolute or actual size, very unfair deductions may be drawn. Accordingly here, in a series of cases, selected on account of their characters presenting certain peculiarities readily recognized and remembered, is given the size of *all* the organs, or at least *all* the more important or more conspicuous and easily measured 'organs;' whereby phrenologists or others may judge for themselves of the relative size or 'development' of the said organ, and of the connection (if any) between such size or development and the actual character of the patients. In *not one* of the 20 cases selected (10 of either sex) did the actual character correspond with what the phrenological examination of the head would have led us to expect."

Some of the instances in this Table are very interesting. We extract a few of the more striking contrasts:—

*Phrenological development.*

1. *Firmness* very large;  
*Veneration* and *Wit*  
small

*Observed psychological character.*

Most inconsistent in his private walk and conversation; affects great sanctity; fond of drollery, especially of the coarse sort; is a good comic actor.

*Phrenological development.**Observed psychological character.*

3. *Constructiveness*, moderate  
Was at one time a most ingenious mechanic and accurate draughtsman.
4. *Concentrativeness*, large  
Fickle and capricious in his occupations and amusements.
- Destructiveness*, moderate  
Was formerly, when excited during the night, addicted to ringing bells, tearing bed clothes, knocking at doors, smashing windows, and other acts of violence.
- Acquisitiveness*, large;  
*Secretiveness*, moderate  
Fancies himself possessed of great wealth, which he is disposed to distribute most lavishly.
- Time*, small  
Is an excellent dancer, and has a good ear for time.
5. *Ideality*, small  
Most imaginative, telling with the greatest ease and pleasure the most extravagant stories.
7. *Philoprogenitiveness*, very large  
Affected by the occasional visits of his wife and children, but never speaks of them during their absence.
8. *Combativeness*, moderate;  
*Destructiveness*, small  
*Alimentiveness*, very large  
Most pugnacious and vicious when excited.
9. *Alimentiveness*, small  
Always fond of a "good feed," but by no means a glutton.  
Voracity notorious; has a large allowance of food for himself, but is always ready to eat that of his neighbours; is cunning and stealthy, and has more than once managed to escape from his gallery to the private rooms of the officers, and in a few minutes to swallow a meal of several courses, intended for several people; in summer, in addition to large quantities of ordinary food, he loses no opportunity of consuming enormous quantities of grass—in short, he appears able to eat and digest anything, and from similar unusual meals his health has never suffered, he being one of the most healthy men in the Institution.
11. *Philoprogenitiveness*, very large  
Has several children, of whom she never speaks, and all remembrance of whom she seems to have lost.
12. *Wit*, small  
Fond of coarse drollery; satirical.
15. *Wit*, small  
A good mimic; sarcastic; fond of all kinds of coarse drollery.

Dr. Lindsay's fifth Table is of equal value. His conclusions are :—

"That, while the head was *apparently* large in 26 cases, it was *apparently* small in 40. These figures are, however, of little value, unless compared with the actual measurements of the head given in our report for 1858 (pp. 17, et seq.) In regard to *shape*, there are a few noteworthy points, viz.,—that the head was well formed in 39 cases, and narrow laterally in 40. The latter peculiarity does not necessarily imply diminution in size, such heads being generally longer in the antero-posterior diameter. The *forehead* was prominent, high, broad, or square, in 17 cases; low in 32; narrow in 43; sloping or receding in 36. A low, narrow, sloping forehead seems, therefore, to have predominated; but that such a conformational peculiarity does not necessarily indicate deficient mentalization is admitted by some phrenologists themselves, and is, to a certain extent, supported by the comparatively average development of the intellectual faculties, as is shown in the abstract of Table I. The *coronal* region was shallow or flattened in 57 cases, high in 25; the region of the sentiments was, therefore, more than twice as often low as high. It is supposed by some phrenologists 'that when the coronal surface of the cranium is high, the individual is exalted in his morality; and that when the forehead is low, and the skull small he is unreflecting or idiotic.'—[Smith, p. 25.] None of these statements does our experience enable us to corroborate except to a very limited extent. The *occiput* was prominent, broad, or projecting in 43 cases; narrow in 4. On the whole, it was prominent or well marked in the majority of cases. The *basal* region, lastly, or that immediately above the ears, was broad in 28 cases, and narrow in only 1."

His summary of the results of his observations are expressed as follows:—

"The general conclusions, to which our phrenological investigations have led us, are the following:—

"1. That, while there is apparently much truth in Phrenology, especially in regard to some of its general laws or doctrines, there is unquestionably more error.

"2. That, while protuberances or depressions on the skull at the site of what are pointed out by phrenologists as the 'organs' of which the human brain is composed, sometimes co-exist with the manifestation or non-manifestation of the propensities, sentiments, or intellectual powers, ascribed as the functions of such 'organs,' there is, at least, as frequently, and probably more frequently, no confirmatory evidence; or discrepancies or contradictions abound to such an extent, that the exceptions are more numerous than the rules.

"3. That the size or development of the protuberances and depressions—in other words, of the 'organs' above referred to—throws no light on our knowledge of the forms and phases of insanity.

"4. That hence the confident predictions of phrenologists, as to the value of Phrenology in the diagnosis of insanity and the classification of Psychopathies, have not been fulfilled: and

"5. That, on the whole, the reporter is not yet prepared to recommend to his brother Alienists the use of" the phrenological systems.

THE RIVAL RACES; OR, THE SONS OF JOEL.\*

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WE have little doubt that the vast section of the public who glean their minimised historical knowledge from Scott, Ainsworth, or James, who regard *Salathiel* as the medium by which accurate information respecting the early Christian ages may be disseminated, and who rejoice in the perusal of a comic Blackstone, a comic Euclid, and a comic Latin Grammar, will feel much pleasure when they read a veritable anthropological novel. The late Eugène Sue, who had exhausted his skill in the depiction of the incongruities attached to apocryphal French maritime successes, the vices of the *ciité*, the tropical swamps of Sumatra, or the subtleties of the Jesuit clergy, when he was satiated with the constant reproduction of scenes of horror, immorality and impossibility, in his last days commenced the novel before us.

The plot is simple. A family of Bretons, the sons of Joel, resident near the classical stones of Karnak, and which, in the ideal mind of Sue, typify the Keltic races of France, are, century after century, encountered by an opponent family, the Nerowegs, of Plouernel, of Frankish (*i.e.*, Teutonic or German) extraction. The wars between the Kelt and the Teuton, the Gaul and the Frank, the aborigin and the invader, range between the years B.C. 57 and A.D. 1849. The events described offer a wide range of variation; they oscillate from the self-immolation of Hena, the virgin of the Island of Sen, who is incremated upon a pile decently and respectfully, as a civilized young lady from Hindustan or Dahomey might be burnt, to the imprisonment of the red Republicans, who had the worst of the conflict at the Paris barricades in June 1848. We believe that our computation is correct when we say, that the amount of rapine and slaughter which is described in this work is unexampled, except on the boards of a melodramatic theatre. It reads like the chronicles of the New England Pilgrim Fathers, who warred against the Indians much in the same manner as the early inhabitants of France, and, unlike the savage Frank, without the excuse of a noble cause, or a truly religious sentiment. Whatever may be said of the amount or nature of the morality which can be inculcated by the perusal of the horrors of traditionary history, M. Sue's work admittedly gives many brilliant pictures of the

\* The Rival Races; or the Sons of Joel. A Legendary Romance. By Eugène Sue. 3 vols. 8vo. London: Trübner and Co. 1863.

physical appearance of the natives of early France and Western Germany. The following description closely resembles that of the warriors of Equatorial Africa; it is that of Riowag, chief of the Rhenish Franks :—

“I knew, indeed, that the Franks often took off the skins of their prisoners with great dexterity, and that the chiefs of the hordes wore these as triumphal ornaments. The proposition of the slayer was received with cries of joy; those who held me bound, sought for a suitable place for my torture, while the others sharpened their knives upon the rocks. Suddenly the chief of these slayers approached me slowly; he was horrible to look upon; a tattooed circle of bright red surrounded his eyes and striped his cheeks; they looked like bleeding gashes upon that blackened face. His hair, knotted at the top of his head, in the Frank fashion, fell down over his shoulders like the mane of a helmet, and was of a copperish colour; round his neck and wrists he wore necklaces of tin; his dress was a cloak of black sheep-skin; his legs and thighs were also wrapped in sheep-skins, bound with crossed skin bands. By his side hung a sword and a long knife.”

It must be recollected that M. Sue was a Gaul, and that the amount of vilification to which our collateral relations, the unfortunate Franks, are exposed throughout his work, is something fearful. We recollect that we were once told by the chief diplomatic representative of a Barbary power, that the “battle of Waterloo was a naval battle, in which the French beat the English;” and with M. Thiers’ account of that battle before our eyes, we feel little surprise at the ingenuity by which M. Sue tries to disguise the fact, that the Teuton and Scandinavian races, whenever opposed to the Kelts or Bretons, in fair fight, vanquished them; the result being caused, we believe, as anthropologists, by the superior physical stamina of the North-eastern race.

“This immense but disorderly camp, was a gigantic and savage town; here and there were their chariots of war, hidden by entrenchments, constructed of earth, and strengthened by trunks of trees; according to the usage of these savages, their untiring lean little horses, with rough and shaggy hides, having a halter of rope for their bridles, were tethered to the chariot wheels, or trees, of which they gnawed the bark. The Franks, clothed in skins of beasts, their beards and hair greasy with tallow, looked stupid and ferocious as well; some lay stretched in the hot rays of the sun, which they had come to seek from the depths of their dark and icy forests; others found amusement in hunting vermin upon their hairy bodies; for these barbarians wallowed in such filth, that although they were encamped in the open air, a foul infectious stench hung about their neighbourhood.

“At the sight of these undisciplined hordes, innumerable but ill-armed, recruited continually by new tribes emigrating in masses from the icy lands of the North to burst upon our fertile and smiling Gaul

as upon a prey, I remembered, despite of myself, some words of sinister prediction which had escaped Victoria; but soon I held in great contempt, these barbarians, who, three or four times superior in number to our army, had never been able, during several years, and despite of bloody battles, to effect any settlement upon our soil.

"As I passed, carried upon the shoulders of the four black warriors, I was pursued by curses, threats, and cries by the Franks. Several times my escort was obliged to use its arms to prevent my being massacred. I remarked a larger and more carefully constructed hut than the rest, before which flaunted a yellow and red flag. A great number of horsemen clad in bear's skins, some in the saddle, some on foot and leaning on their lances, posted around that habitation, showed that one of the chiefs of these hordes occupied it. I again begged Riowag, who walked beside me, ever grave and silent, to conduct me first to the chief whose banner I perceived, after which they might kill me; my request was in vain, and we entered a green wood, and at last reached the centre of a great glade. At some distance I noticed a natural grotto, formed of great blocks of grey rock, between which, here and there, tall firs and chestnuts grew; a spring of water, running over the rocks, fell into a sort of natural basin. Not far from this cavern, stood a narrow vessel of brass, about the length of a man; a net of iron chains covered this infernal cauldron. Four great stones supported this vessel, beneath which was heaped a quantity of brushwood and logs; whitened human bones, scattered on the ground, gave the glade the appearance of a place of slaughter. In the centre of the glade arose a colossal statue with three shapeless heads, roughly hewn in the trunk of an enormous tree."

When, however, M. Sue attempts to describe his own supposed ancestors, the Gauls, he does not exhibit the same minute fidelity of description. Their physical characters are passed over without a word. As regards their dwelling houses, M. Sue, on authority of Thierry, Dom Bouquet, Herodian, Vitruvius, and Strabo, thus describes them:—

"The house of Joel, like all rural habitations, was very spacious, of round form, and constructed by means of two ranges of hurdles, between which was well beaten clay, mixed with chopped straw; then the outside of this thick wall was plastered with a coat of fine, fat earth, which, in drying, had become as hard as stone; the roof, large and overhanging, formed of rafters of oak joined together, was covered with a layer of seaweed, too thick for the water to penetrate. On each side of the house extended buildings destined for the harvest, stables, sheep-folds, cellars, and wash-houses. These several buildings, forming an oblong square, enclosed a large court, shut up, during the night, by a massive door. Outside, a strong palisade, planted behind a deep ditch, surrounded the building, leaving behind them and it a sort of lane all round, some four cubits broad. In this, two large and very savage war-dogs were let loose every night. To this

palisade there was an exterior gate, corresponding to the interior gate of the court. Every place was closed at nightfall.

"The number of men, women and children, all more or less related to Joel, who assisted him in farming, was considerable. They lived in buildings dependent on the principal house, where they assembled at noon and evening, to take their meals in common.

"Other habitations thus constructed, and occupied by numerous inhabitants, whom their lands maintained, were dispersed here and there throughout the country, and composed the *lignez*, or tribe of Karnak, of which Joel had been elected chief."

Many amusing anecdotes are related of the manners and customs of the Gauls, none of which, however, rest on the statements of contemporary history. The only conclusion at which we can arrive is that they were a set of wretched savages; and we think that the conquests which extirpated the Gaul to introduce the Frank, like those which destroyed the Briton to make room for the Saxon, were of the greatest benefit to humanity. The philosophy of Charles Darwin is most sound on this point. That the extirpation of the lower race should be the immediate cause of "the most exalted object which we are capable of conceiving, namely, the production of the higher animals,"\* is a sound biological generalization. The historical event, that the autochthonous Gaulish race has been nearly "improved off" the face of the earth, we consider to have been conducive to the well-being of Western Europe. Now that such ideas as these are no longer confined to anthropologists, but are uttered by the politician, we have no doubt that such amusing and instructive works as that of M. Sue will be diligently perused, so long as they faithfully depict the struggles of a nation to attain an impracticable liberty, or the futile efforts of a doomed race to maintain its position in the ethnic scale.

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## RAMSAY ON GEOLOGY AND ANTHROPOLOGY.†

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PROFESSOR RAMSAY'S lectures, amongst the geologists for which they were destined, will inevitably receive the support they so eminently deserve. We believe that the whole work, and especially the

\* Darwin, *Origin of Species*, 1st edition, p. 489.

† *The Physical Geology and Geography of Great Britain; a Course of Six Lectures delivered to Working Men in the Museum of Practical Geology, Jermyn Street.* By Professor A. C. Ramsay, F.R.S., President of the Geological Society. 8vo. London: Stanford. 1863.

second lecture, which treats of metamorphism and contortions of strata, may be indicated as a model series of elementary lectures, in which the author has adhered to the strict paths of logical science, while, by a charm of language, a lucidity of style, and a prudent abnegation of all unproven and unproveable hypotheses, Professor Ramsay has added new laurels to his geological fame. Scientific men will sooner or later learn that the "rapid and right" progress of truth is best advanced, not by the proposition of chimerical hypotheses, or vague speculations, but by the diffusion of accurate and positive facts, inductively ascertained, amongst the thinking world. However tempting it may be to discuss Professor Ramsay's geological facts, we must pass them over in the attempt to answer the broad question, "What is the bearing of this work on anthropological science?"

After Professor Ramsay has discussed, in his sixth lecture, the more striking effects of the physical geology of the country on population and industry, the following passage occurs:—

"I would now wish to say a few words on the influence of geology upon the inhabitants of different parts of our island.

"Great Britain is inhabited by two or three great races, more or less intermingled with one another. It requires but a cursory examination to see that the barren districts, as a whole, are inhabited by two branches of one race, distinct from each other, and yet alike, while the more fertile parts are occupied by one or two other races. Thus the north of Scotland, beyond the great valley, is, as every one knows, chiefly inhabited by the Celtic Highlanders. On the east, along the coasts of the Moray Forth, Caithness, and in the Orkney and Shetland Islands, the people are of Scandinavian origin and speak Scotch, thus standing out in marked contrast from the Gaelic clans, who possess the wilder and higher grounds in the interior and western districts. There is here a curious relation of the human population to the geological character of the country. The Scandinavian element is strongly developed along the maritime tracts, which, being chiefly composed of Old Red Sandstone, stretch away in long and fertile lowlands, while the Celts are pretty closely restricted to the higher and bleaker tracts where the barren gneissic and schistose rocks prevail.

"From an early period it appears that on both sides of the Channel, the Continent of Europe, and what is now Great Britain, were inhabited by a Celtic population, known to us in our history by the name of the Cimri, whom we call Welsh, or the ancient Britons. Further north another Celtic people, whom we know as the Gaels, inhabited the greater part of what is now termed Scotland, and, I believe, the whole of Ireland. Which of these two Celtic races is most ancient in our islands we seem unable clearly to make out; there are a great many theories on the subject, but I do not think it has been proved to demonstration that one of them is later than the

other. It is not improbable, however, that the Highlanders, who are now largely intermixed with a deal of Scandinavian blood, once spread further south than what is considered the southern borders of the Highlands, and were forced to retire northwards into their mountains, through the superior power of another Celtic population that worked its way northwards from the more fertile districts of England and south of Scotland, for no race would willingly inhabit an area composed of barren mountains if it could take up a position on more fertile lands. A great number of the names of places in the centre and south of Scotland are not Gaelic, but names that can be translated by any one who has even a comparatively superficial knowledge of Welsh, such as I happen to possess. It is therefore probable that the southern and midland parts were inhabited in old times by the same race of people that now inhabit the extreme west of England, or Wales. And to a certain extent this is proved by the ancient British literature. I use the word British as applied to Welsh literature. But however this may be, it is certain that the Britons or the Welsh tribe of Celts overspread at one time (when the Romans invaded our country) the whole of the southern part of Great Britain; by and bye, after the Roman invasion, they mixed with their conquerors, but the Romans, as far as blood is concerned, seemed to have played but a very unimportant part in our country. They may have intermarried to some extent with the natives, but they occupied our country very much in the manner that we now occupy India. Coming here as military colonists, they went away again as soon as their time of service was up and left the country altogether. But after the retirement of the Romans, invasions took place by the Danes, the Scandinavian tribes, the Anglo-Saxons and others who came in to occupy the country permanently. Then the native tribes, dispossessed of their territories and driven westwards, retreated into the interior and higher parts of the country. Their remains are still extant in Devon and Cornwall, where there is a tolerably pure Celtic race, and among the Welsh mountains where the same Celtic element is still to a great extent free from admixture. They were driven back into the mountainous regions, whither it was not worth the while of their pursuers to follow them, in order to dispossess them of those barren tracts. Thus it happens that the oldest tribes now inhabiting our country are to be found among the old palæozoic mountains, which, composed of the most ancient of our geological formations, and rising up into the highest grounds, must have been the first parts of the British islands to rise above the waters, during the last elevation of the land."

The coincidence between the geological formation and the ethnic differences is at least remarkable. There was, however, a time when the Keltic races stretched over the mesozoic and cainozoic formations of Eastern England, when the present ethnic outliers of the Hebrides, Western Scotland, Man, Wales, and Cornwall, were all connected into one kindred population speaking a Keltic language. "Denuda-

tion" and "erosive action" have, however, rendered them a scattered people, while the mesozoic and cainozoic formations are filled with the modified and mixed descendants of the Jute and the Saxon.

We hope that at some future time Professor Ramsay may work out the problems contained in his sixth chapter more in detail. He concludes in the following words:—

"When we come to consider the nature of the population inhabiting our island, we find it also to be greatly influenced by this old geology. The aboriginal tribes have been driven into the more barren mountain regions in the north and west, and so remain to this day—speaking to a great extent their aboriginal languages, but gradually melting up with the great mass of mixed races that came in with later waves of conquest from other parts of Europe. These later races settling down in the more fertile parts of the country, began to develop its agricultural resources. In later times they have applied themselves with wonderful energy to turn to use the vast stores of mineral wealth which lie in the central districts. Hence have arisen those densely peopled towns and villages where the manufactures of the country are carried on. Yet in the west, too—in Devon, and Cornwall, and in Wales, where the great slate regions are—there are busy centres of population, where the mineral products are worked by the aboriginal inhabitants of Celtic origin.

"It is interesting to go back a little and inquire what may have been the condition of our country when man first set foot upon its surface. We know that these islands of ours have been frequently united to the continent, and as frequently disunited, partly by elevations and depressions of the land, and to a great extent, also, by denudations. When the earliest human population reached their plains, they were probably united to the continent. Such is the deliberate opinion of some of our best geologists. They do not assert it as a positive fact, but they consider it probable that these old prehistoric men inhabited our country along with the great hairy mammoth, the rhinoceros, the cave bear, the lion, and the hippopotamus,—that they travelled westwards from the Continent of Europe, along with these extinct mammalia, over that continuation of the land which originally united Great Britain to the Continent. But in later times denudations and alterations of level have taken place, chiefly, I believe, great denudations of the chalk, and of the strata that cover the chalk, and then our island has become disunited from the mainland. And now, with all its numerous inlets, its great extent of coast, its admirable harbours, our country lies within the direct influence of the Gulf Stream, which influences the whole climate of the west of Europe, and we, a mixed race of people, Celt, Scandinavian, Saxon, Norman, more or less intermingled in blood, are so happily placed that, in a great measure, we have the command of the commerce of Europe, and send out our fleets of merchandise from every port. We are happy, in my opinion, above all things in this, that by denudation we have been dis severed from the Continent of Europe,

for thus it happens that, uninfluenced by the immediate contact of hostile countries, and almost unbiassed by the influence of peoples of foreign blood, during the long course of years in which our country has never seen the foot of an invader, we have been enabled so to develop our own ideas of right and wrong, of political freedom, and of political morality, that we now stand here, the freest country on the face of the globe, enjoying our privileges, under the strongest and freest Government in the living world."

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### BARUCH SPINOZA.\*

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MUCH of the scope of the present work is theological, and the principles on which the *Anthropological Review* is conducted preclude the discussion of theological subjects. The *Tractatus Theologico-Politicus*, however, contains much valuable information respecting purely scientific topics which have, since Baruch Spinoza gave to the world those profound works which will be for ever associated with his name, become even popular. As the learned and anonymous editor of the *Tractatus* observes:—

"The Hindus preceded the Hebrews in civilization by hundreds, perhaps by thousands of years, and in their Vedas, which existed in writing centuries before the Jews became serfs to Egyptian taskmasters, they have not only given us a clear insight into their religious world, but have actually transmitted the record of this in the tongue which is the root of all the dialects spoken in Europe to the present day. It might have been that the Sanscrit Vedas had descended to us as our especial religious inheritance, when we should have had Brahm, Vichnou, and Siva as our triune divinity. The Zends, again, the religious books of the ancient Persians, are of great antiquity, and, as the Persians were nearer neighbours of the Jews than the Hindus, so do we find that they have influenced Jewish ideas in a much greater measure."

Much credit is due to the editor, and especially to the publishers, who have produced this valuable work in a compendious form and at a cheap price. Many readers will gladly peruse it, if only to study the thoughts of an author whose terse and vigorous style has raised him for the last two hundred years to the position of the best-abused author in philosophy. We would very much like to see the *Ethica* of the same author published in the same manner as the present volume.

\* *Tractatus Theologico-Politicus*; a Critical Inquiry into the History, Purpose, and Authenticity of the Hebrew Scriptures: with the right to free thought and free discussion asserted, and shewn to be not only consistent, but necessarily bound up with true piety and good government. By Benedict de Spinoza. From the Latin; with an Introduction and Notes by the Editor. 8vo. London: Trübner and Co. 1862.

## ANTHROPOLOGY IN THE NURSERY.\*

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MANY of the errors which pervade the educated classes of society are due to the diffusion amongst them, while their memories are strong, and before their understanding is matured, of statements contained in the school books forced upon their infant comprehension, which, although wholly at variance with known facts, become articles of compulsory belief for their acceptance. In the above little book, which we especially select as the most complete, as well as the most exact elementary geographical compendium in our language, the English public, which is always prone to view cheap literature with too favourable eyes, will find some exceedingly puzzling statements respecting the races of men. The author of this school compilation says, "man is adapted to live in all climates excepting those of extreme cold." We need not tell our readers that this is the reverse of the fact, and that man cannot live (and thrive) in all climates. We know not what idea of "adaptation" the child who reads this statement is expected to possess; but the simple fact that the Europeans in Bengal die out in the third generation, contravenes the assumption of the cosmopolitanist. But the most wonderful statement which we remember perusing since the days of Gulliver, is that "the original people of Australia are considered of the same race with the Hottentots of South Africa." This is indeed an original theory; and is nearly on the same mental level as the statement which we heard an African traveller make a few months ago in a semi-scientific audience, that the Hottentots were a mixed race produced between the Dutch and the natives of the Cape settlement. England is possibly the only country in Europe where such a statement could have been made, and we regard such exhibitions as most detrimental, not only to anthropology, but to general education, as it presupposed an amount of ignorance respecting the early colonization of the Cape Colony of which we can only find adequate precedents in the infant school. The time will shortly come when the legitimate desire of the people to give to their children scientific text-books really worth reading may be gratified, and when the teachers who disdain to impart sound elementary knowledge, on the selfish plea, *illos vero indignos puto, quibus rationem reddam*, will find that they no longer address an attentive, or a remunerative audience.

\* Geographical Primer (Chambers' Educational Course). 12mo. London and Edinburgh: William and Robert Chambers.

## Miscellanea Anthropologica.

*Acts xvii, 26.* A correspondent sends us the following:—I send you a list, and value, with respect to date, of the authorities for omitting and retaining *ἀιματος* in the text of *Acts xvii, 26*. Alford believes the weight of evidence to be in favour of *ἀιματος*, and retains it in the text.

<i>ἀιματος</i>			
OMITTED IN			
Codex Alexandrinus	-	-	v cent. Uncial MS.
„ Vaticanus	-	-	iv cent. „
„ Regius	-	-	xi cent. Cursive MS.
„ Coistinianus	-	-	xi cent. „
„ Harleianus	-	-	xv cent. „
„ Genevensis	-	-	xi cent. „
„ Alexandro-Vaticanus	-	-	xi cent. „
„ Venetianus	-	-	xi cent. „
Version Vulgate	-	-	iv cent.
„ Coptic	-	-	iii cent.
„ Sabidic	-	-	iii cent.
„ Æthiopic (which join together <i>ενοι. εἰ ενος and και ταπεινα</i> )	-	-	iv cent.
Author Clement	-	-	ii cent.
„ Bede	-	-	viii cent.
INSERTED IN			
Codex Bezae	-	-	v or vi cent. Uncial MS.
„ Laudianus	-	-	vi or vii cent. „
„ Angelicus Romanus	-	-	ix cent. „
„ Mutinensis	-	-	ix cent. „
<i>Most of the Cursive MS.</i>			
Greek Codex, cited in Bede's Com- mentary	-	-	vii cent. „
Version Peschito-Syriac	-	-	ii cent.
„ Philoxenian Syriac and other versions	-	-	vi cent.
Author Irenæus	-	-	ii cent.
„ Theodoretus of Cyrus of Syria (twice)	-	-	v cent.
„ Chrysostom (often)	-	-	iv cent.
„ Cosmus Indicopleustes	-	-	xi cent.
„ Theophylact, Archbp. of Bulgaria	-	-	xi cent.
„ Œcumenicus of Tricca	-	-	xi cent.

“Meyer (Dr. H. A. W.) well remarks on the omission that it is more likely to have happened owing to *ενος ἀιματος* than that *ἀιματος*

should be a gloss on *εως*,—for that this would be rather given by *αρθρωτου*." Alford.

*N.B.* As a rule, the Uncial, are of greater value than the Cursive MSS.

*Superstitions of Nations.* Mr. HALIBURTON, Vice-president of the Nova Scotia Institute, has been lecturing at Halifax, N.S., on a comparison of the customs and superstitions of nations, as affording evidences of the unity of origin of the human race.

In all ages and in all countries, a sneeze is supposed to be an omen of impending evil to the person who sneezes, or to an undertaking which he may at the time be commencing, and an invocation of the Deity is requisite to protect the sneezer from the danger he incurs. Among the ancients, Homer mentions it. Aristotle fruitlessly endeavours to explain its existence; Apuleius refers to it; and Pliny has a problem on it: "Cur sternutantes salutantur." Tiberius observed it, and rigidly exacted the custom of protecting the person who sneezed, by an ejaculation to the gods. The Jewish Rabbis were equally puzzled to account for its existence among the Hebrews, who to this day exclaim "Tobim Chaim" (a long life to you) on such occasions.

But the custom is also met with in the most remote parts of Asia, among the most secluded nations of Africa, and in many tribes of the New World. De Soto, in his wanderings in Florida (which country he discovered), noticed that when a Sachem sneezed, the savages around him bowed down, and invoked the sun to save him. In Otaheite, it is the custom to invoke the protection of Heaven, when a person sneezes. Mariner relates the like of the natives of Fiji, and of the Tonga group.

Mr. Haliburton considers that these remarkable identities in the observance of so irrational a custom took their rise from the religious fears and superstitions of primitive man, the common parent of all these widely-scattered tribes; and he regards it as a strong proof of the unity of the human race. Let anthropologists answer the question, how else did all men, in all countries, arrive at the same singular conclusion, as to the mysterious dangers attendant on a sneeze, if this belief, was not inherited from a common source?

Among Celtic tribes (as, for example, in the superstition of the Highlanders) the influence of the fairies is the danger to which the sneezer is exposed, and minor spirits of an analogous grade are those guarded against by the invocations of the Polynesian savage.

*Proposed Exploration of Peru.* (Extract of a letter from Professor Raimondi, Lima, 13th July, 1863, to William Bollaert, Esq., London). "Accept my thanks for the trouble you have taken to translate for the society from my work on Loreto, what appertains to anthropology. The work in question is but a small specimen of the materials I am getting together for my large work on Peru, which will amount to at least twenty thick volumes, and will take up the whole of my lifetime to complete.

"Since I had the pleasure of exploring with you the province of Tarapacá in 1855, I have not ceased to wander over this interesting

country, collecting precious materials connected with geography, meteorology, anthropology, mineralogy, geology, zoology, and botany.

"Such is the abundance of materials already collected, that I fear I shall never be spared to finish my explorations, and publish my labours. I have the idea to divide my work into separate portions. The first to be the geographical, including meteorology, and all I have been able to collect about the different races which now occupy Peru, particularly as to their origin. I have a great number of crania for this object, of the people who inhabited Peru before the conquest. The second part will embrace mineralogy; the third, geology; the fourth, botany; the fifth, zoology.

"I have still to explore for the next four years, so as to complete my studies. The publication of my great work cannot take place for some years; but I will from time to time publish short memoirs, which I shall send you copies of, so that you may distribute to the learned societies of England.

"I am now starting from Lima for the interior, a journey of eighteen months. I go to Callao; then to Pisco, by sea; then to Ica, where I have my animals awaiting me: then onwards to Arequipa. Here I shall remain a month, so as to examine the mineral waters in the vicinity; also to explore the volcano of Misti (Arequipa). Then to Moquegua and Tacna. Then I shall ascend to the table-land of Titicaca, and go all round the great lake analysing the waters. From Puna I intend to enter the tropical forests of Carabaya, where I shall be two or three months, so as to study with care the Chinchonas and the gold washings. Then I go to Cuzco, to examine its country, returning to Lima by another route.

"If you like you can make this, my projected exploration, known to the learned societies in England, and I shall be glad to receive any views of theirs, and be glad to attend to their instructions. I shall be in Arequipa until October. Address to me, care of Dr. Miguel, Colunga School of Medicine, Lima."

*Mental Calculation.\** All the performances of Colborn, Buxton, and other celebrated calculators, appear insignificant when compared with those of our contemporary, Zacharias Dase, of Hamburg. Having had ample opportunities to witness his extraordinary performances, I shall first describe what took place on the 12th, 15th, and 19th of January, and subsequently add what I have observed in my daily personal intercourse with him.

Dase commenced by casting a rapid glance on twelve ciphers written by a spectator on a board, and reciting them forwards or backwards. He then invited any person to multiply the number with any single number, and immediately named the multiplicator on the product being communicated to him.

At the third representation, Dase recited 188 ciphers, forwards and backwards, stating at the same time how often and at what place each number occurred. I subjoin a few of the questions and answers.

\* Versuch einer Wissenschaftlichen Begründung der Psychologie. Von Professor Dr. P. Jessen. Berlin: 1865.

Q. What is the product of 354783293 multiplied by 5423957?  
 A. ( $1\frac{1}{2}$  minutes) 1924329325550401.

Q. What is the product of 6529710840352 divided by 98? A.  
 (instantaneously) 66629710840352.

Q. 684028396281753, divide by 6541325. A. ( $2\frac{1}{2}$  minutes)  
 104570312  $\frac{138353}{6541325}$ .

Q. Divide 423339075240048565 by 708346795. A. (after five  
 minutes) 597643807.

Q. Tell the square root of 582169. A. (immediately) 763.

Q. What is the cubic root of 318611987? A. 683.

Q. Tell the 19th root of 7093585369945932256195429028464404423  
 A. (after three minutes) 87.

Q. The steeple of the Nicolay Church being 180 feet high, how  
 many such steeples must be towered upon each other before the last  
 reaches the moon, assuming the distance to be 50,000 German miles?  
 A. (immediately) 6666666 and two-thirds.

Q. What time would a snail require to perform this journey, as-  
 suming that it covers two inches and three-sevenths in a minute?  
 A. (after a few minutes) 5929411764  $\frac{1}{17}$  minutes; 98823529  $\frac{7}{17}$   
 hours; 4117647  $\frac{1}{17}$  days; or, 11281 years and  $82\frac{1}{17}$  days.

At the end of his representations, Dase gave some specimens of  
 what he calls his "surveying glance." Thus, he mentioned at once  
 the number of a handful of peas or beans, the number of books on  
 the shelves, or the pieces in a bundle of firewood without a moment's  
 hesitation. If ever he commits an error, he instantly corrected it.  
 Thus, he estimated the number of a handful of peas to be 242, but  
 he immediately corrected it by saying that he had probably counted  
 two peas twice.

The most difficult tasks which Dase performed were the extraction  
 of the 52nd root of a number of 97 ciphers, and the multiplication of  
 two sums, each consisting of 100 ciphers, which he accomplished at  
 Munich, in  $8\frac{3}{4}$  hours.

He stated that during this calculation, the conversation of the spec-  
 tators rather entertained him, and that neither noise nor loud conver-  
 sation disturbed him in the least.

On my questioning him how far he thought he might go in  
 multiplication of sums, he replied that he could not tell, but he had  
 no hesitation in saying that he could undertake the multiplication of  
 sums of 300 ciphers, and might probably require 100 hours mentally  
 to accomplish the task.

From the experiments it resulted that he solved the multiplication of  
 8 ciphers in  $\frac{3}{4}$  of a minute; 12 in  $2\frac{1}{4}$  minutes; 20 in 6-8 minutes;  
 40 in 40 minutes; 60 in 3 hours; 100 in  $8\frac{3}{4}$  hours.

Zacharias Dase, the son of a publican, was born at Hamburg,  
 June 23, 1824. He was sent to an infant school at the age of two  
 and a-half years, and entered a popular school in his sixth year. Up  
 to his fifteenth year he received instruction in reading, arithmetic,  
 writing, geography, history, and the German language. He was  
 always the first in arithmetic, nor was there any book published on

this subject in Hamburg which he had not studied through. He says of himself:—"Originally I occupied myself more with written than with mental calculation, and I am therefore justified in asserting that, though my calculating capacity may be innate, it has been developed by undeviating industry. My mind never becomes fatigued by calculations. I may continue them for the whole day and am as fresh to begin again in the evening." From his early childhood Dase suffered from a spasmodic affection of the stomach, and epileptic attacks. Speaking of his moral character, he says:—"I am not passionate nor sensual; I am indifferent to the fair sex; I avoid spirituous liquors; I am good natured, tolerant, companionable, a man of peace, and make no distinction in my intercourse with my fellow beings, whether they be of high rank or not; I am fond of children, and am rather economical." With regard to his mental faculties, he complains that he could make no great progress in mathematics, that he had no memory for form and space. Nor did he make much progress in the highest branches of arithmetic, his great skill being limited to the extraction of roots, the calculation of factors and logarithms. He could give no exact account of the process by which he arrived at his results; but he seems to proceed in his mental calculations as if he were performing them on paper or a slate. In multiplying, all the numbers are plainly visible to him; he multiplies the multiplicands successively with the multiplier, placing the sums mentally beneath each other. He further states that besides this capacity for number, he possesses order and locality in an eminent degree, so that in large towns he soon finds his way. He complains of possessing neither the faculty of ambition nor wit, but, on the other hand, much patience.

*Man and the Gorilla.*—As the work by Professor OWEN (*Catalogue of the Osteological Collection in the College of Surgeons*. 4to. Lond. 1853) may not be accessible to all our readers, we make no excuse for reprinting the following excerpt, in the present state of our knowledge of the subject:—

"The chief differences which the cranium and teeth of the Tr. gorilla present, as compared with those parts of the human structure, may be summed up as follows:—1. The smaller proportionate size of the cranium; 2. The more backward position of the foramen magnum, and its more oblique plane in relation to the base of the skull, 3. The smaller relative size, and more backward position of the occipital condyles; 4. The longer basioccipital, and broader, flatter, and lower superoccipital; 5. The longer basisphenoid, and shorter alisphenoids; 6. The smaller size of the coalesced parietals; and their separation from the alisphenoids; 7. The conversion of a greater part of the outer surface of the parietals into concavities or depressions for the lodgment of the temporal muscles, by reason of the bony crest developed from the line of the obliterated sagittal suture and of the lambdoidal crest; 8. The larger proportion of this crest and of the squamosal plate developed from the mastoid, and the smaller size of the proper mastoid process; 9. The smaller size of the vaginal

and styloform processes, and the absence of the styloid process, arising from the non-ankylosis of the stylohyal bone; 10. The larger post glenoid process and the longer auditory process (tympenic bone,) with their relative position, one behind, but not below the other; 11. The position of the stronger zygomata opposite the middle third of the basis cranii; 12. The prominent superorbital ridge; 13. The longer nasal bones, ankylosed together, and flattened at their lower half; 14. The greater proportional size, and greater prominence of the upper and lower jaws; 15. The longer osseous palate, and the median emargination of its posterior border; 16. The parallelism of the alveoli of the molars and canine of one side with those of the other; 17. The diastema or vacant place in front of the socket of the canine in the upper jaw, and behind that socket in the lower jaw; 18. The large and more produced premaxillaries; the persistence of more or less of their sutures, showing the intervention of their upper extremities between the nasal and maxillary bones; 19. The minor extent of the connexion of the lacrymal with the "pars plana" of the œthmoid, or their separation by the junction of the orbital plate of the maxillary with that of the frontal behind the lacrymal; 20. The greater depth of the rhinencephalic fossa, and the absence or rudimental state of the crista galli; 21. The squamosal, lambdoidal, alisphenoidal, and pterygoid air-cells; 22. The more prominent cusps of the molar teeth; 23. The larger relative size, and more complex grinding surface, of the last molar tooth in both jaws; 24. The larger relative size of the premolars, especially of the first; 25. The more complex implantation of the premolars by three roots, two external, and one internal; 26. The much larger and longer canines; 27. The sexual distinction in the development of these teeth; 28. The more sloping position of the crowns of the incisors; 29. The broader and higher ascending ramus of the lower jaw; 30. The total absence of the prominence of the symphysis forming the chin."

*Extracts from "Zeitschrift für Völkerpsychologie", by Drs. Lazarus and Steinthal. Berlin, 1859. (Journal for National Psychology.)*—Introduction. . . . Anthropological-physiological and climatal conditions, however much they may contribute towards the explanation of a national character, can never sufficiently explain the psychical state of a nation . . .

Ethnology, as it has been hitherto treated, may be termed a chapter of zoology, for its object is, properly speaking, man considered as an animal, a natural product, independent of his mental development, merely according to his physical structure and his diversities as they are found conditioned by soil and climate. There are also taken into consideration the descent and relations of nations, their intermixture and migrations.

But man is by nature more than an animal. Man is a spiritual animal, with innate mental dispositions, inclinations, feelings, independent of his spiritual development in history. Man must also be considered in this aspect. Ethnology would, thus treated, not actually

abandon zoology; we would only add psychical ethnology to physical ethnology. Its object is to fathom the specific mental activity of the various minds, in as far as they form the psychical nature of nations. . . .

Franklin's definition, "Man is a tool-making animal," is, both theoretically and practically, important. New forces are imparted beyond those given by nature, whilst animals are confined to them. And the instrument and its products re-act on the mind, stimulating its inventive powers. Not less important is it that man can invent spiritual instruments. Rules, laws, and schemes are formed to arrange the perceptions. . . .

The metaphysical dispute, whether the history of the human species commences with a gradual progress or decay, does not concern us. Science cannot take into account the mythical suppositions of a destroyed antediluvian civilization; it must attempt to elucidate the development of humanity from historical facts, and the mental condition of mankind as it manifests itself at present.

*To the Editor of the "Anthropological Review."*—Sir,—At page 186 in the report of the discussion before the Anthropological Society\* it is stated, that Mr. Bollaert mentioned a case of a number of Negroes being kidnapped and carried to Easter Island, where they rapidly died out of dysentery and measles.

What I said was, that a number of the aboriginal (say Polynesian) inhabitants of Easter Island (between 75° 5' and 75° 12' south latitude, and between 109° and 110° west longitude) had been kidnapped and taken to Peru, with the intention of making labourers of them. They could, or they would not, be taught to work. The Indian generally is not a working individual, and, consequent on the change of climate and food, many had died of dysentery and measles.

I may add, that kidnapping of natives from some of the Polynesian islands had been perpetrated, and they had been taken to Peru as labourers. However, the native and French authorities in those seas put a stop at once to this nefarious proceeding, as did also the Peruvian government.

At page 191 of same report the following may be added to my observations relative to Jewish blood in New Granada:—Not long after the discovery of America, some two hundred Jewish families having had Romanism thrust upon them in Spain, emigrated to Antioquia, in the interior of New Granada. Here Spaniards, Israelites, and Criollos mixed freely, producing, according to Samper, a New Granadian writer, "the most beautiful and energetic Mestizo-European race known in Spanish America. At present the state of Antioquia contains more than 300,000 inhabitants: of these 250,000 correspond to this mixed race, in which figures the Jewish element."

London, May 2, 1863.

W. BOLLAERT.

\* We insert Mr. Bollaert's note, but take the opportunity of observing that we do not hold ourselves in any way responsible for the contents of the Journal of the Society, just as the Anthropological Society is in no way responsible for the contents of the Review. ED.

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[The Council of the Anthropological Society wish it clearly to be understood that the Authors alone are responsible for the facts and opinions contained in their respective Papers.]

LONDON.  
TRANSACTIONS  
OF THE  
ANTHROPOLOGICAL SOCIETY OF LONDON.

ORDINARY MEETING, APRIL 21ST, 1863.

DR. HUNT, PRESIDENT, IN THE CHAIR.

THE minutes of the previous meeting were read and confirmed.

THE HON. FOREIGN SECRETARY announced that the following gentlemen had been elected Honorary Fellows of the Society:—M. Boudin, Vincennes; M. Paul Broca, First Secretary of the Anthropological Society of Paris; M. von Baer, St. Petersburg; M. Boucher de Perthes, Abbeville; M. Pierre Gratiolet, Paris; Dr. Lucæ, Frankfurt; Dr. J. Aitken Meigs, Philadelphia; Dr Nott, Mobile; M. A. de Quatrefages, President of the Anthropological Society of Paris; M. Renan, Paris; Professor Rudolph Wagner, Göttingen; Professor Theodor Waitz, Marburg.

THE HONORARY SECRETARY announced that the following Fellows had been elected since the last meeting:—Jacob Boys, Esq., Grand Parade, Brighton; John Strachan, Esq., 1, Avondale Place, Glasgow.

A list of various pamphlets presented to the Society since the last meeting was read, and a vote of thanks passed to their respective donors.

MR. ALFRED TYLOR, F.L.S., F.G.S., read a communication *On the Discovery of supposed Human Remains in the Tool bearing Drift of Moulin-Quignon.* (See p. 166 of the *Anthropological Review.*)

THE PRESIDENT said that, from his own experience, he considered the Abbeville pitmen more honest than those at Amiens. He found that everything discovered in the pits near Abbeville was first of all offered to M. Boucher de Perthes. The flint instrument exhibited by Mr. Tylor, and which was found near the jaw, is too smooth and sharp to be genuine. Dr. Carpenter has described the jaw as very heavy, but Mr. Tylor tells us it is light.

MR. MACKIE inquired whether any genuine implements had been found in the bed whence the jaw was obtained.

MR. TYLOR. No.

MR. C. CARTER BLAKE said that the jaw had been described as almost of a black colour, and he considered that this was presumptive evidence against its authenticity, as he was not aware of any bones from the gravel having that colour.

Mr. MACKIE remarked that the jaw was taken from "the black seam flinty gravel", and that it would be unfair to press the question of colour.

Mr. CHARLESWORTH said that, if this was a case of deception, it was one of the most successful he had ever known. Great skill is sometimes shewn in the forging of flint antiquities; a large manufactory of such articles existed for years in the north of England, and in one case, at least, the forging was less from a mere desire to make money, than from a pure love of deception. The jaw in question seems to be a marked example of the Papuan type; and it is extremely difficult to conceive whence the workmen could have procured such a specimen.

Mr. DAVIES stated that, as far as his experience went, all bones from the gravel are of a light colour.

Mr. TYLOB.—The jaw is not rolled, although the deposit in which it was found is a stormy one. It may possibly have been obtained from the Roman cemetery at Amiens, and been taken over to Abbeville by the workmen.

The PRESIDENT promised to present to the society some Roman skulls found by him at Amiens.

The HONORARY SECRETARY read extracts from a paper by Dr. Julius Schvarcz, F.G.S., *On Permanence of Type, in connexion with Human Origins.*

The PRESIDENT remarked that Dr. Schvarcz's paper traced, with great learning and ability, the doctrines of permanence of type and of different foci of creation, through præ-alexandrine writers. The Greek opinion on these subjects is to some extent confirmed by modern research; for we find that as far back as authentic records go the races of man have not changed their characters.

Mr. BENDYSHE suggested that Aristotle's opinion of the primitive distinctness of the different nations was chiefly attributable to his ignorance of foreign languages, and consequently of the close philological relationship between languages of races the most dissimilar physically.

Mr. MACKIE thought that the permanence of the Egyptian type is to be attributed to their having lived for so many ages under the same climatal and social conditions. The same might be said of the Jews and Negroes, the representations of which on Egyptian monuments so closely resemble the Jews and Negroes of the present day.

A discussion on the characteristics of the Jewish race followed, and was joined in by Mr. Meschin, Mr. J. F. Collingwood, and Mr. Prideaux.

The HONORARY SECRETARY read extracts from a paper by Mr. Wake, *On the Relations of Man to the Lower Animals.*

Mr. WAKE having requested that, as portions only of his paper had been read, no discussion might take place,

The PRESIDENT adjourned the meeting.

## ORDINARY MEETING, 12TH MAY, 1863.

DR. HUNT, PRESIDENT, IN THE CHAIR.

THE minutes of the previous meeting were read and confirmed.

The HON. SECRETARY announced that the following gentlemen had been elected Fellows since the last meeting:—John Stevenson, Esq., 4, Brougham Street, Edinburgh; H. B. Owen, Esq., 1, Swiss Villas, Chorlton Road, Manchester; W. W. Boreham, Esq., F.R.A.S., Haverhill, Suffolk; Rev. W. Whitear, 20, Roman Road, Barnsbury; J. Mathiesen, Esq., 22, Belitha Villas, Barnsbury Park; Richard Lee, Esq., 46, Upper Gower Street, W.C.; Dr. Peacock, 20, Finsbury Circus; W. Pinkerton, Esq., Hounslow; Abel Smith, Esq., 1 Great George Street, Westminster; T. B. Armitstead, Esq., Padnoller House, Nether Stowey, Bridgwater; Captain Cameron, H.M. Consul at Mapowah, Abyssinia; Dr. John Shortt, Zillah Surgeon, Chingleput, Madras; Gerald Perry, Esq., H.M. Consul, French Guiana.

A list of various pamphlets and newspapers presented to the society since the last meeting was read, and the thanks of the society voted to the respective donors.

Mr. W. BOLLAERT read a paper, *Observations on the Past and Present Populations of the New World.*

*Abstract.*—Mr. Bollaert premised his remarks by stating that he leaned rather to the Polygenist than to the Monogenist theory of the method of human creation, and would for the present consider the red or copper coloured man of the new world to be of one species, peculiar to itself, especially in the scale of intelligence; and that as to his antiquity he may have existed in the pliocene, miocene, or even in an older period. Accepting the Polygenistic hypothesis, the principal species on the earth, as regarded colour in particular, might be put as follows:—1, White; 2, Brown; 3, Red; 4, Black, etc., from which proceed endless varieties, by commixtures. Before the discovery of the new world by Columbus many of its natives appear to have arrived at the apex of civilization their organization and intelligence had permitted them to arrive at; not a high standard, if compared with the powers of mind of the white man.

It had been roughly estimated that at the period of the discovery of America its native population amounted to over 100 millions; at present they were less than  $12\frac{3}{4}$  millions. The present pure and mixed population was over 73 millions, including  $25\frac{1}{2}$  for the Spanish American republics,  $31\frac{1}{2}$  for the United States, the remainder for Brazil, the West Indies, etc. The million of Negros, as slaves, that had been imported, were adverted to as being a working population, to fill up the void caused by the extermination of the Indians, who were not found to have great industrial propensities.

The red men of the United States constituted a great ethnic realm, and formed into many nations and tribes; they had been builders of earth-works; they had continued as hunters and warriors; they had languages, dialects, and numbers, but they had not arrived—and in

this there was a common agreement throughout the new world—at the discovery of an alphabet; at least no alphabetic form had as yet been discovered.

The Mexican and Central American nations formed another ethnic realm; they had been great builders in stone, and highly ornamented, and at an early date; and had peculiarities, when compared with nations to the north and south of them.

Two great streams of emigration seem to have gone from the main land to the West Indies; one giving rise to the peaceful Lucayans, the other to the warrior Caribs.

Arriving in South America the first nation of importance met with was the Chibchas of the table-lands of Bogota, which, like those of Mexico and Peru, were seated on the ruins of others long since passed away. Continuing south, on other table-lands, the first nation heard of was the Quito; this was conquered by the Caranes, who ascended from the coast of the Pacific, but were in turn mastered by the Incas of Peru.

The next assemblage of people occupied Peru, which had been very early visited by nations; these had left remarkable sculptured stone monuments, particularly at Tia-Huanaco, on a table land 13,000 feet above the level of the sea, and were looked upon with as much wonder by the Incas, as the modern Greek looks upon those wondrous ancient ruins in his land.

To the south in Chile roamed, amongst others, the still unconquered Araucanos, and in this same category might be placed the Patagonians, Guaranis, tribes of Brazil, of the Amazon, and those further north; these last having Carib characters. So much for the Ante-Columbian period, and which had a pure species of humanity, viz., the Red Indian.

*Mexico*, showing a population of 8,283,088, its present inhabitants compose Criollos, calling themselves Mexicans; however, the remnant of the Indian nations, is the true ethnic Mexican, and a pure race, which is found to be as persistent as ever in its physiological character, but possibly to be destroyed by connexion with the white and black species. The Mestizoe is a very mixed breed, of White and Indian; so is the Zambo, of the Negro and Indian, not having persistent characters, as being only a mixture of various species.

Mr. Bollaert stated that it was no uncommon occurrence, when the mines of Potosi, and others in the elevated regions of Peru, at from 12,000 to 14,000 feet, were worked by the old Spaniards, for them to have their wives conveyed to the coast during the latter months of pregnancy, and they remained there some time after giving birth; for it was found that this removal was almost necessary for satisfactory parturition.

*Central America*, composed of Guatemala, Costa Rica, S. Salvador, Honduras, and Nicaragua, contains 3,000,000, principally Indians and coloured people; the lower lands, when compared with much of Mexico, are more congenial to the Negro and dark varieties. In Mosquitia there are some 50,000, principally Indians.

*New Granada* has a population of 2,373,000; Whites or Criollos

only 450,000. Whites, Indians, and Negroes have mixed, particularly in this region, producing endless varieties. Mr. Bollaert said it appeared to him, that a detrimental influence, physically and morally, has been produced by the mixture of the three species since about 1500, and that the *in-and-in* breeding of the Mulatto variety, in particular, seemed soon to result in sterility; Dr. Nott observes, "They die out in three or four generations." There is reason to believe, from some difficulty in rearing Mestizoe and even Criollo children in many portions of the New World, is one cause of the general non-increase of population, also that unprolific varieties are produced by the white, black, and Indian species, and not prolific races—see what difference there is only in the osteology of the white and black species. The result of this mixture of species has often produced the most violent acts of democracy, not the battles for liberty; true liberty belongs rather to the white races of Europe; and imported white nationalities even into the United States are difficult to settle down into seriously law-obeying people.

Samper says, "In South America the races of Shem, Ham, and Japhet have embraced fraternally, tending to re-constitute the unity of the human family." The author of the paper observes, that this monogenistic view of the subject will be pleasing and satisfactory only to the mixed breeds. If the mixed white races in the United States find it difficult to go on smoothly with their democratic notions, how much less can unity be expected amongst their republican brethren in South America.

*Venezuela*, by a recent computation, shows a population of 1,052,000, including only 298,000 Criollos or Whites, the greater number being mixed breeds, a powerful and turbulent party. Coolies have been imported for some time past.

*Ecuador*.—A late census gave 2,200,000. Here we have 607,219 Whites, the Indian predominating.

*Peru* has 2,300,000, including 240,000 Whites, the greater portion Indians, but, with the introduction of the Negro, "more than twenty-three distinct varieties are well known and distinctly named." Chinese have been regularly imported for years past as labourers. Some Polynesians have also been kidnapped, but this traffic was soon stopped; the change of climate and food was fatal to the latter.

*Bolivia* has 2,133,896, "Whites and others" (Criollos, romanised Indians, and Mestizoes), 1,373,896, the rest being wild Indians. These "Whites and others" are very revolutionary. The author was informed by General Belzu in 1860, that, during his seven years of presidency, he had had to quell thirty revolutions! In 1858 the Republic of Mexico had been in existence thirty-eight years, and had had fifty-six violent changes of government!

*Chile* has a most thriving population of 1,646,894, exclusive of 20,000 unconquered Indians. Here there is but little of the Indian, and less of the Negro elements; the climate is also most favourable to man. Nearly 20,000 foreigners are now settled in the country. In the last thirty years landed property has risen tenfold; its ports are scenes of the greatest activity; mining and agriculture are most pro-

sporous; the public treasury has generally a surplus; public works, including several railways, are going on, one 150 miles in length: that of Copiapo pays 20 per cent. Santiago, the capital, may be called a city of palaces; education is extending among the poorer classes, and European emigration is directing its steps thither.

The *Argentine* Republic has at present a population of about 1,750,000 Argentinos, composed of Whites, few Mestizoes, and romanized Indians, also some 50,000 wild Indians. As this is a very healthy portion of South America, it is particularly well suited for the breeding of horses, cattle, and sheep, also for agricultural and mining pursuits; it bids fair in a few years to be in a most satisfactory condition, with its railroads now being made to traverse the great Pampas of Buenos Ayres.

*Paraguay* has over 1,000,000, composed of a few whites, many Mestizoes, and more Indians.

*Uruguay*, or Banda Oriental, is progressing very fast, mainly by European immigration. When the author was there in 1826 it had only 60,000 to 70,000; it has now 300,000. The white man can labour in this climate, or as a herdsman, sheep farmer, and agriculturist.

*Brazil* in 1835 had a population of about 4,000,000; it has now 8,000,000, one-half being Negroes as slaves. The whites are of Portuguese descent, composing one-sixth; there were 500,000 Indians, Mulattoes, and Zamboes, also some Chinese and Coolies.

The *Guayanas*.—British Guayana has 160,000, nearly all people of colour, including Indians. Dutch Guayana, 86,725, principally blacks and mixed breeds, including 3,000 Jews. French Guayana: whites, 1,025; people of colour, 1,982; Negroes, 13,200; Indians, 10,000; total, 26,207.

*West Indies*.—The aboriginal Lucayans and Caribs have long disappeared. Negroes and Mulattoes, some still in slavery in the Spanish Islands, constitute three-fourths of the population, say of 4,000,000; nearly all the other fourth takes in every shade of Mulattoes; the English, Spanish, Danish, French, Dutch, and their descendants, constitute a small minority of white population. The slave "traffic" introduces into Cuba over 40,000 African Negroes annually.

*British North America* has a white population of 3,488,620.

*Russian America*—Red Indians, Esquimaux (not of the American species), 50,000; Aleutians (not Americans), 8,700; total, 58,700.

*Danish America*—Esquimaux, and decreasing, 9,800.

*United States of America*.—The Anglo-Saxon colonists soon learnt that the aborigin was only a hunter and warrior, and could not be induced to work. The colonists did not form domestic alliances with the Indian female.

In 1837 the white population of the United States was	12,689,856
„ Coloured—free Negroes and Mulattoes	- 237,864
„ Slaves—Negroes and Mulattoes	- - 2,791,588

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15,719,308

exclusive of Indians.

In the early part of 1863 we learn that the population of the United

States is nearly 32,000,000 (and that it had augmented in ten years nearly 10,000,000), including the slaves, black and Mulatto, 3,500,000; free black and Mulattoes, 500,000. In the free states the white population had augmented 41 per cent.; in the slave states the whites had increased 32 per cent., and the slaves only 22½ per cent. During three centuries some 14,000,000 of African Negro slaves have been imported into the New World.

Mr. Bollaert stated, that in the foregoing he has confined himself to statistics and the more marked physical characters of the present inhabitants of the New World; but that he cannot bring himself to think that the mixture of the white, red, and black species produces other than varieties, such varieties not being the best specimens of humanity, if examined physiologically, psychologically, or by their political history; that he once intended to have examined minutely into the causes of the continual revolutions in Spanish America, one of the principal causes of which he attributes to the mixture of species; but he now only adverts to what is going on in the "late-lamented institution," the United States of America, from the people of which extensive country something better might have been expected than the most sanguinary civil war on record, for here the belligerents are of the white races of Europe and their descendants.

The author concluded by stating that he had been induced to go into the consideration of the past and present populations of the New World by the following reasons:—

1. That America, when first discovered in 1492, had an aboriginal population of probably over 100 millions; at present they are only about 12½ millions!

2. That in the late Spanish-American colonies and present Republics the Whites have not increased in any way approaching that of the Whites in North America, which he attributes in a great measure to difference of climate.

3. That the fusion, or rather *confusion*, of the White, Indian, and Negro elements, particularly in the Spanish portion, is unfavourable to a strong, healthy, and prolific progeny, which produces the numberless *varieties* of Mulattoes and Zamboes.

4. That there has been a continuous cry from the South American Republics for the last thirty years for European immigration; but there have been two great drawbacks for a favourable response:—1. The generally-continued state of anarchy; and 2. The climate.

5. That the mixed breeds or varieties are not so prolific as pure species.

6. That in many of the Republics children of European parents are reared with more or less difficulty.

7. That the long war of independence thinned the male population, and, since that war terminated, many of the said states have had long periods of sanguinary civil war, which is attributed, in a great measure, to the circumstance of the mixed populations of Whites, Indians, and Negroes.

Dr. BERTHOLD SEEMANN said that he could from his own experience confirm Mr. Bollaert's observations respecting the comparative infertility both of the descendants of Europeans living in America,

and of the offspring of mixed marriages. He had generally found that Americans have only two or three children. In Panama the mulattoes often have many children, but they die early. Dr. Seemann stated that he fully believed that the present population of the United States would die out, if it were not constantly recruited from Europe. The Americans seem, too, to be assuming the characteristics both mental and physical of the aboriginal Indians. They are moody, often sitting for long together without saying a word, but when excited talking with extraordinary vehemence; they are very lean, have no calves, and their hair is long and straight, very seldom curly. In some parts of the United States, however, very fine men are found, especially in Kentucky. Dr. Seemann thought they were of German origin; he had himself conversed with a Kentuckian seven feet nine inches high, who spoke German.

Mr. BOUVERIE PUSEY cited the Hungarians as disproving Mr. Bollaert's assertion of the infertility of mixed so-called species of man, the Hungarians being a mixture of a yellow and a white race.

Mr. BOLLAERT replied that the yellow species is nearer to the white, than the brown or black.

Mr. BENDYSHE inquired whether there is anything on record about the prolificness of the Indian women before the conquest. As an instance of the deleterious effect of the climate of North America, he mentioned the case of a gentleman who, after ten years of married life in Canada was childless and almost imbecile, but who, on returning to Europe, was restored to health, and had a child. Mr. Bendyshe also ventured to express an opinion that the gigantic Kentucky man had come from Yorkshire.

Mr. C. C. BLAKE stated that he agreed with the lamented Dr. Knox as to the demoralizing effect of intermixture of races. The Zambos appear to have reached the lowest depths of moral degradation. Dr. Knox foretold the future extinction of the American race, but his opinions on the subject, ridiculed at the time, were now confirmed by observation.

THE PRESIDENT said that a great change of opinion appeared to be taking place with regard to the acclimatisation of man. The same law against the rearing of European children obtains in India and Australia as in South America. These, and a mass of other facts tend rather to the conviction that man has not that power which has so often been ascribed to him, of living and producing prolific offspring in all the climates of the world. Dr. Hunt also stated that he did not suppose that Dr. Seemann meant to assert that the Americans were actually being converted into Indians, but he considered that there is no doubt that the inhabitants of the United States have from some cause or other assumed some of the mental and several of the physical characteristics of the aborigines.

Professor JOHN MARSHALL, F.R.S., exhibited the *Brain and Calvarium of a Microcephale*, and read the following notice of the case.

The person whose brain and calvarium I bring before the notice of the Anthropological Society this evening, was an idiot boy, who died at the age of twelve years, of secondary abscess of the lung, following on lumbar abscess. The brain was presented by my colleague

Professor Jenner, to the University College Anatomical Museum, and has been entrusted to my care for the purpose of having the convolutions carefully examined and described. Dr. Jenner was anxious, however, that some notice of this specimen should be read before your society, as an appropriate accompaniment to the account of another microcephalic brain recently given to you by my friend R. T. Gore, Esq., of Bath. I accordingly undertook to give you the substance of Dr. Jenner's notes, as recorded in the Museum Catalogue,—taking the liberty of arranging the matter in an order suited to your requirements, and reserving the account of the convolutions for a Memoir, which I propose to offer to the Royal Society, on the brain of a Bush-woman which has lately come into my possession.

	Inches.
The total length of the trunk was - - -	39 $\frac{1}{2}$
"    "    abdomen - - -	13 $\frac{3}{8}$
The width at the shoulders - - -	9
"    pelvis - - -	7

The sternum was slightly prominent. There was some hair on the pubes. The testicles had not descended into the scrotum; but were found on dissection in the inguinal canal. The left pupil was larger than the right, and was directed inwards and slightly downwards. The orbits were large; their superior margins covered the eyeballs much less than usual, so that the eyeballs appeared prominent.

	Inches.
The circumference of the head above the ears was - - -	13
From the root of the nose to the occipital protuberance -	7 $\frac{1}{2}$
From the external auditory opening to the outer canthus of the eyelids - - - - -	2 $\frac{5}{8}$
From the external auditory opening to the symphysis menti	4
From the symphysis menti to the occipital protuberance -	12
From the root of nose to a line passing vertically from one external auditory meatus to the other - - - - -	1 $\frac{1}{2}$
Length of sagittal suture - - - - -	2 $\frac{3}{4}$

The calvarium was thick and heavy; the parts corresponding with the sutures thinner than other portions and more transparent, an appearance owing to the absence of the diploe at those points; the inner surface is deeply marked by the convolutions. The adhesion between the dura mater and the calvarium was slight; but the dura mater was rather thick.

	Ounces.
The weight of the cerebrum was - - - - -	6
"    "    cerebellum - - - - -	2 $\frac{1}{2}$
"    "    entire encephalon - - - - -	8 $\frac{1}{2}$
The specific gravity of the grey matter was - - - - -	1·082
"    "    white ditto - - - - -	1·042

The convolutions were strongly marked but few in number, and rather narrow, varying from one-fourth to three-eighths of an inch in width. The posterior part of the posterior lobe did not extend backwards further than an inch and a quarter behind the external auditory foramina. The depth of the longitudinal fissure was three-quarters of an inch. There was very little fluid anywhere. The left lateral

ventricle being opened seemed rather large in proportion to the rest of the brain. The choroid plexus was large and thickened. The length of the corpus callosum was three-quarters of an inch. The corpus striatum (of the left side) seemed small in proportion to the optic thalamus. The septum lucidum was firm and normal but rather broad. The posterior lobes of the cerebrum overlaid the cerebellum, and were normal in form but deficient in size. The corpora quadrigemina was perfect in shape, but rather large in proportion to the rest of the brain. The medulla oblongata was large; the olivary bodies being especially so. On the surface of the brain the grey matter was from three-twentieths to one-fifth of an inch in depth, apparently in proportion to the size of the brain.

Such, gentlemen, is all the information on this interesting specimen, which I am enabled to give you from Professor Jenner's notes.

Professor MARSHALL proceeded to make some observations respecting the case of microcephaly brought to the notice of the society by Mr. Gore. The specimen appeared to be a particularly valuable one, not having its ventricles distended by fluid. It would be exceedingly valuable for the purpose of a study of the convolutions; as it frequently happens, for example in that described by Dr. Todd, that the ventricles are so distended with fluid that the surface of the brain is rendered so smooth as to present great difficulties in the examination of the convolutions. Professor Marshall also alluded to the supposed similarity between the brains of idiots and those of the higher apes, and maintained that the objects are not comparable, as the brain of the ape, though low, is perfect, but that of the microcephale is essentially imperfect.

After a few observations from Mr. BLAKE, the President adjourned the meeting.

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#### ORDINARY MEETING, MAY 26TH, 1863.

SIR CHARLES NICHOLSON, VICE-PRESIDENT, IN THE CHAIR

The following new members were elected:—C. Brainsford, Esq., M.D., Haverhill; W. E. Stanbridge, Esq., Wombat, Victoria; Capt. A. H. Russell, Hawkes Bay, New Zealand; John Evans, Esq., F.G.S., Nash Mills, Hemel-Hempstead; George Macleay, Esq., Burlington Hotel; W. Winwood Reade, Esq., Conservative Club.

Mr. BLAKE called especial attention to the photographs which M. Quatrefages had presented to the society of the jaw from Moulin-Quignon.

Mr. CHARLESWORTH remarked on the important discrepancy between the statements of Professor Busk and Dr. Falconer, the one doubting the great antiquity of the jaw, the other the reputed age of the gravel in which in the fossil was found. He also directed the attention of members to the opportunity afforded by the discovery, of investigating the question in a systematic way, which might lead to the final settlement of the question geologically and anatomically.

Mr. BLAKE remarked on the present state of our knowledge as to the respective ages of the high and low level gravel as developed in

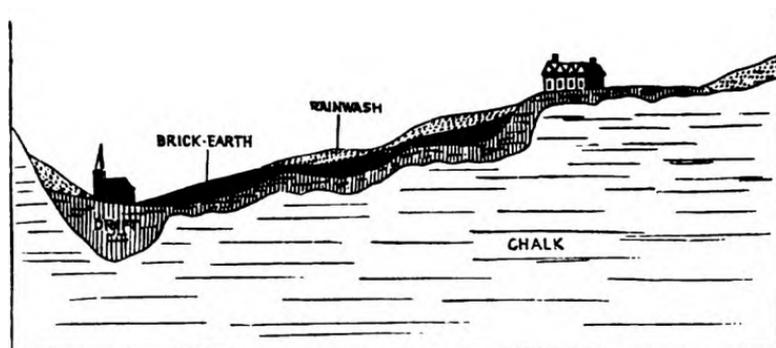
the neighbourhood of Abbeville, and stated that the bed at Moulin-Quignon was referable to the former, or earlier division of the series.

Professor GEORGE BUSK, F.R.S., then read the following paper:

*Notes on some Human Remains found at Luton, near Chatham.*  
By GEORGE BUSK, F.R.S.

When my attention was first drawn by Dr. Hunt and Mr. Carter Blake to the bones, on which the few following observations are offered, it was supposed by the Rev. Mr. Rivers, through whom they had been forwarded to the Anthropological Society, that they had been imbedded in the *brick-earth*, or superficial alluvial or fluvial deposit covering the drift gravel which fills the bottom of the Vale of Luton, near Chatham. Had this really been the case, the bones would of course be of the very highest interest.

The observations and inquiries, however, of Mr. Hughes, an officer of the Geological Survey, have since shown beyond doubt that the remains in question were lodged, *not* in the brick-earth, but in a more superficial soil, brought down by the weathering and rain-wash of the hill side, and filling up the hollows on the surface of the brick-earth,\* as shown in the accompanying diagram, prepared by Mr.



Hughes, from whose letter to Professor Ramsay the following extract will make this part of the subject quite clear: "I have not," he says, "the least hesitation in stating that they were in the rain-wash or run of the hill, and *buried in that*. They were found at a depth of about six feet, in the bed marked (a). The soil above them was mixed with black mould and disturbed, as if there had been a pit there. Two large stones were found between the skeletons, as if they had been thrown in after them. One of these, I was informed, was rag-stone, the other a piece of sand-stone, similar to that frequently found in the gravel."

The interest, therefore, that would have attached to the bones, had they been of an antiquity at all commensurate with that of the brick-earth, no longer appertains to them.

But although this special interest is wanting, the remains, and more especially the crania, nevertheless present several points of some interest, and it is upon these I now proceed to remark.

\* A "terrain meuble sur des pentes" of M. Elie de Beaumont.

The skulls, as the figure will show (figs. 1 and 2), are very

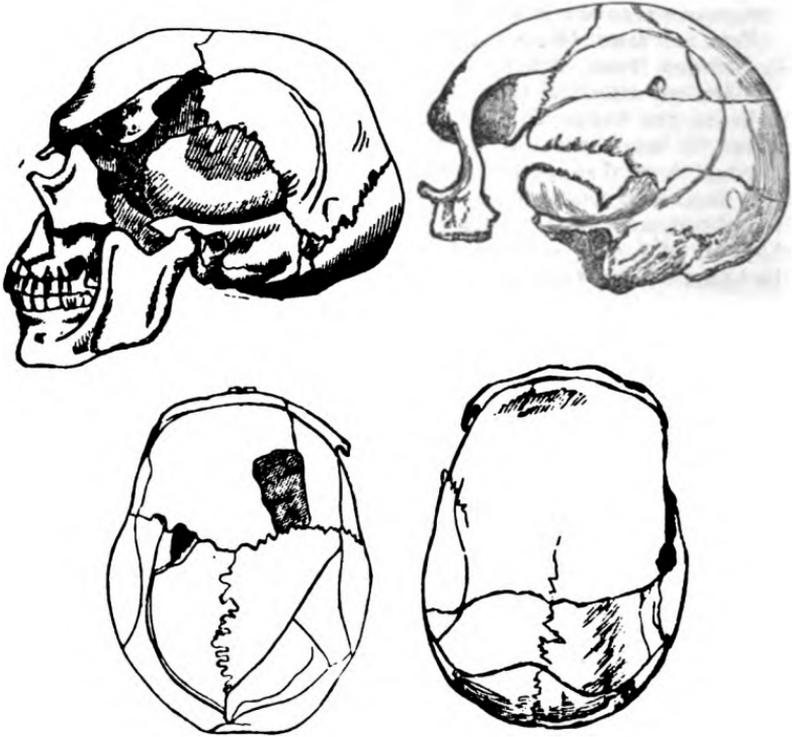


Fig. 1.

Fig. 2.

much alike in all essential characters, a circumstance usually observable in crania belonging to very ancient and comparatively unmixed races. They are dolichocephalic, orthognathic, but at the same time phænozygous;\* of an elegant ovoid contour in the vertical view, and perfectly symmetrical. Their dimensions, as far as the broken state of the bones allowed of their being taken, are as under :

Crania.	Longitude.	Breadth.	Height.	Least frontal.	Greatest frontal.	Parietal.	Occipital.	Zygomac.	Frontal radius.	Vertical radius.	Parietal radius.	Occipital radius.	Maxillary radius.	Fronto-nasal radius.	Circumference.	Longitudinal arc.	Frontal do. do.	Parietal do. do.	Occipital do. do.	Frontal transverse arc.	Vertical do. do.	Parietal do. do.	Occipital do. do.	Cranial index.
No. 1	72	53	55	3.05	4.35	4.2	4.5	—	4.3	4.4	4.6	4.25	4.05	3.6	20.0	4.7	4.6	5.0	14.3	11.3	11.9	12.55	11.6	73
No. 2	73	50.5	—	3.6	—	4.1	4.9	—	4.3	4.45	4.75	4.2	—	3.0	20.0	—	4.9	4.7	—	11.6	12.3	12.9	12.0	68

\* In certain crania, viewed on the vertical aspect, the zygomatic arches can be seen projecting more or less on the sides, whilst in others these processes are wholly concealed. For the former condition I venture to propose the term "*phænozygous*," and for the latter "*aphænozygous*."

In No. 1, which alone is furnished with the lower jaw, that bone has its angle everted; the teeth are in very perfect condition, and betoken a man in the prime of life or early manhood. The mastoid processes and muscular impressions in both crania are well developed. The frontal sinuses capacious, and the supraorbital ridges prominent. The lambdoidal sutures are complex, but there are no wormian bones.

In the absence of all extraneous evidence, beyond what the site and mode of their sepulture may afford, we have no guide in the condition or conformation of the bones themselves, to anything more than a conjecture with respect to the age to which they belong. Their condition shows a long residence in the ground, and proves that the skeletons have remained undisturbed in their resting place. In form they do not belong to either of the two more ancient types of crania found in Britain, viz., the cymbecephalic, supposed by Dr. Wilson to be the most ancient, and the brachycephalic, considered by the learned authors of the *Crania Britannica* as the true ancient British form. But besides this, on examination of the bones themselves, before I was informed of Mr. Hughes' account of the true nature of the ground in which they were buried, I saw sufficient evidence to prove that they had in all probability belonged to individuals living at a time when sharp metallic weapons were in use, and therefore, that all question of their belonging to the stone period, or even to that in which the only metal was bronze, might be dismissed. Both the individuals to whom the skulls belonged appear, in fact, to have been killed by sword cuts on the head. No. 1 seems to have received two cuts meeting at an acute angle behind the vertex, and also a downward cut, which has shaved off the left external angular process of the frontal bone, the edge of the weapon, which was slightly notched or hacked, also glancing off and removing a very thin slice from the surface of the squamous part of the temporal bone on the same side. The malar bone has also been broken by the force of the blow. No. 2 was probably slain by a single cut on the right side of the head, causing a straight incision through the frontal and parietal bones, extending from the temple to above the ear. The skull in this case also appears to have been broken in or smashed by some blunt instrument, such as a club or mace, or large stone, etc. And it is not, therefore, very unlikely that one or other of the two large stones found with the skeletons was the agent by which this injury was inflicted either immediately before or after death. From the direction, and situation of the cuts on the top of the head, it may be supposed that they were given from above, when the victims were upright; and I therefore imagine that they were slain by an opponent or opponents on horseback.

Another point worth attending to in these bones, as in all old bones perhaps, is the amount and kind of chemical change they have undergone—a subject to which, notwithstanding the attention that has been devoted to it, still requires very considerable elucidation. The shortest way of showing the comparative change in the Chatham bones, will be to place their analysis in a table, with that of some other bones, either fossil or of considerable but uncertain antiquity. The following are the only ones I have myself as yet had time or opportunity to examine.

Constituents 0/00.	Organic matter.	Carbo-nates.	Phosphates, etc., etc.	Foreign Elements.
Recent human bone (humerus)....	32.6	8.3	60.	
Chatham (loam, etc.) .....	16.	17.	67.	Much iron.
Lewisham (chalk) .....	9.5	10.2	81.	Iron.
Leicester (gravel under a house) ..	21.05	14.7	64.1	Iron.
Mewslade (ochreous loam) .....	25.	8.0	68.	Iron.
Gallo-Roman, St. Acheul (sand) ..	30.	7.7	63.	Iron.
Danish kitchen-midden (animal?) (pebbles) .....	16.5	13.5	70.	Iron.
Mesnières (ferruginous gravel) ....	9.0	7.7	83.3	Iron, abundant.
Menhecourt (fossil, sand) .....	8.	14.	78.	Iron; fluorine.
St. Acheul (fossil, gravel)* .....	8.7	18.	74.	Iron, abundant; fluorine.
El. primigenius: (coprolite beds)†...	5.07	8.0	87.0	Iron very abundant in form of sulphuret; fluorine.

The list is of course too meagre to serve as the basis for any general consideration respecting the posthumous chemical changes in bone. I shall, therefore, with reference to it merely remark, that it appears probable: 1. That in almost all cases, whatever the soil or situation, long-buried bones contain a notable amount of *iron*; 2. That the amount of organic matter is invariably much diminished; 3. That the proportion of carbonates is usually much augmented; 4. That a still longer abode in the ground, whatever the soil, is attended with the acquisition of a marked quantity of *fluorine*, as has been often shown before.

Mr. BLAKE paid a high tribute of admiration to Professor Busk for the ingenious manner in which he had put together the fragmentary remains which at an early period had been placed on the Society's table [*Anthropological Review*, p. xi], and complimented him on the lucid manner in which he had deduced the age and conditions of deposit.

Mr. CHARLESWORTH suggested the great value of investigating the chemical conditions of fossil before determining their geological age. In the Crag deposits the bones look recent, but the amount of animal matter contained in them is no proof of their geological age.

Professor BUSK pointed out that the bones in the Crag contained a large quantity of fluorine, much more than in the bones from Abbeville.

An animated conversation then ensued respecting the genuineness of the human jaw from Abbeville, in which Professor Busk, Mr. C. C. Blake, Mr. Charlesworth, Mr. Hogg, Mr. Pengelly, and the President took part.

\* The St. Acheul bone, though losing the above weight by incineration, is not charred, nor does it afford the odour of burnt animal matter.

† A considerable evolution of sulphur on incineration.

## ORDINARY MEETING, 9TH JUNE, 1863.

DR. HUNT, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting were read and confirmed.

It was announced that the following gentlemen had been elected since the last meeting:—

*Fellows.*—J. Peiser, Esq., Barnfield House, Oxford Street, Manchester; W. Spencer Cockings, 20, University Street, Gower Street; F. W. Wood, Esq., Hollin Hall, near Ripon, Yorkshire; Thomas Aitken, Esq., District Lunatic Asylum, Inverness; W. F. G. Benson, Esq., 115, Kensington, Liverpool; Danby P. Fry, Esq., Gwydyr House, Whitehall.

*Local Secretaries in Great Britain.*—Rev. P. B. Brodie, Rowington, near Warwick; Professor Buckman, Cirencester; Sebastian Evans, Birmingham; Charles Groves, Esq., Wareham; J. W. Jackson, Esq., Glasgow; Hector MacClean, Esq., Ballygrant, Islay; Rev. H. F. Rivers, Chatham; George Tate, Esq., Alnwick; Thomas Tate, Esq., President of the Hastings and St. Leonard's Philosophical Society, Hastings.

The following list of presents received since the last meeting, was read, and thanks voted to the donors:—The skin and skull of an adult male gorilla (*Troglodytes gorilla*), a harp formed of roots of a vegetable, and a collection of fan knives, Camma cloths, etc., etc., collected in Western Africa, presented by W. Winwood Reade, Esq.; Cook's voyages, first edition, presented by W. S. Cockings, Esq.

Mr. BENDYSHE, M.A., presented a *Human Lower Jaw and Femur*, and read the following observations on them:—

The bones I have the pleasure to present to the society this evening were discovered about a fortnight ago, by the workmen who are employed in digging for coprolites on the property of my brother, Capt. Bendshe, at Barrington, in Cambridgeshire.

They lay between four and five feet below the surface, and about one or two inches from the rock—the green-sand in which the coprolites are contained. All the rest of the skeleton had disappeared, except a few fragments, and no relics were found with it. The individual to whom they belonged had evidently been buried at full length.

The tenant informs me that for several years past the labourers have occasionally turned up scattered human bones in different parts of the field. But it was not till about three years ago that they attracted much attention. In the Spring, however, of 1860, he resolved to under-drain a part of the field which slopes gently towards the south, and which in consequence had always been drier than the adjacent soil.

In the course of the operation a considerable number of skeletons was found, all regularly buried; many with the bosses of their shields, their spear-heads, beads, fibulæ, and other antiquities. Some of the skeletons were in very good preservation, and were those of persons of large stature, considerably over six feet. Many, if not all of them, bore unmistakable marks of violence, and had been placed in the ground without any attempt to give a trace of composure to the dead.

Some small skeletons, probably of females or children, were among the number.

A bloody conflict had evidently taken place close by, and these I am inclined to think must have belonged to the victorious party, from the depth at which the bodies were found, and the care taken that each should lie out by itself.

It appears from history, that the Danes invaded East Anglia about A. D. 870, and in 875 Cambridge, which is about six miles distant, became their head-quarters. They remained in possession of the country about fifty years; and it seems very probable, from the nature of the articles found with these bodies, that they are those of Anglo-Saxons who fell here in one of the numerous skirmishes which must have taken place during that period in the neighbourhood.

This skeleton was found some yards to the south of the sloping ground, and though the ground has been completely excavated all round it for yards, there was no trace of any other burial nearer than the numerous entombment I have just mentioned.

Some Roman coins were found, I understand, at no great distance, a short time ago, in a place about a foot below the ground, where I had myself picked out some pottery from the midst of soft burnt earth.

It is, therefore, open to question whether these bones belonged to an Anglo-Saxon, a Roman, or a British provincial.

The coins and pottery might be held as evidence that a Roman villa had once stood there, and the remains of the owner may be before us. The Anglo-Saxons, however, inhabited the Roman houses long after the fall of the empire, and possibly the possession of some such buildings or enclosures may have determined the scene of the struggle that clearly took place close by. It is evident from the soil that no trees have been planted since the period these bodies were buried.

In the Autumn the slope which is called Edix Hill will be thoroughly excavated by the coprolite diggers, and I have no doubt I shall be able to present to the society some more important remains of our ancestors than those upon the table.

Mr. C. C. BLAKE: The jaw appears to have belonged to a young individual; the angle of the jaw is everted, a character very commonly found in Roman jaws. A large proportion of animal matter is present in the bones.

Mr. CHARNOCK read a paper *On the Science of Language*. [Parts of this paper will be found embodied in an article in the present number of the *Anthropological Review*.]

The PRESIDENT said that it was considered by some that anthropology does not include the science of language. He himself could not agree with that opinion; he thought it an essential part of the science, and one which, if studied scientifically and in its broadest aspect, would produce most valuable results. Language has been indicated by some to be the true and insuperable barrier sharply dividing man from the lower animals. But this doctrine would appear chiefly to find favour amongst anatomists, who, failing to discover in their own science any rigidly defined distinction between man and

other animals, imagine that such difference is to be found in some branch of science of which they are ignorant. In some of the inferior races of man the vocabulary is very small, and the language hardly superior to the inarticulate languages of barn-door fowls or rooks.

Mr. PRIDEAUX thought that the real difference between the languages of brutes and those of man is, that the former are not conventional, and are understood by all animals of the same species.

The DUC DU ROUSSILLON thought language exceedingly useful for ascertaining the different relations of races. The comparison of the names of mountains and other permanent landmarks appears to be especially valuable for tracing the ancient inhabitants of countries. As an instance of the wide-reaching chain of connection furnished by language, the Duc referred at some length to the resemblances between the Romanesque and Pushtu languages. It resulted from his investigations, that these languages are identical in origin. In 4,000 Pushtu words he had found 500 identical in sound and meaning in Romanesque, 1,000 only slightly changed, and many others more modified, but still identifiable. Similarity of grammatical structure is said to be the most permanent connecting link between allied languages; but the grammars of the Pushtu and Romanesque have very few features in common. The cause must be attributed to the grammar of the Latin language, which modified the existing grammar of the Celtic at the time of the conquest of Gaul by the Romans. At that epoch the ruling element in Gaul was composed of tribes of Scythian origin; and we know that the Scythians were more ancient than the Egyptians.

Mr. BENDYSHE thought that the only tenable theory of the origin of language was what Max Müller calls the "bow-wow" theory. Of course, the onomatopœic words of a language would, in the course of its development, become fewer and fewer, so that it would by no means follow, because imitative words are rare in the languages of to-day, that they did not in earlier ages form the greater part, and originally the whole, of language. Picture-writing appears to point to this theory; and the fact that in Arabic there are many words which it is impossible to denote in European characters, makes it doubtful how far similar words really resemble each other. The Veddas appear, according to Sir Emerson Tennant, to have no language; and Herodotus also mentions a people who were devoid of speech, and who, when they wished to barter with foreigners, brought down their merchandize by night to the shore, left it, and returned the next night, expecting to find the goods in exchange. In the comparison of languages, it has not been sufficiently remembered, that when we hear of such words as *serpens* being like *sarpa*, or like *ερπας*, we hear the words uttered by the same mouth, and one which is accustomed to a particular style of pronunciation.

Mr. BOUVERIE PUSEY: Sir Emerson Tennant did not mean to say that the Veddas have no language, but merely that they do not understand the language of the people they trade with. So with Herodotus probably.

Mr. OWEN PIKE: Professor Max Müller says, that the root words

to which he conceives all languages may be reduced express general ideas; but I submit that his assertion is, at all events, not proven. He also says that general ideas are peculiar to man; but if I say "cat" to my dog, he looks after cats in general, not some particular cat; therefore, animals have general ideas. It is evident that the Professor has made a confusion between general and abstract ideas. He also concludes that, because Aryan roots express general (*i.e.*, abstract) ideas, the words composing the original language of mankind represented general ideas; but it is not pretended that the Aryan is the original language, and no one has yet been able to trace out the connections of the immense number of languages not included in the Aryan family. It has required, too, the microscopic eye of Max Müller to see the resemblances between the different Aryan tongues. The theory of the unity of language is, for some reason or other, much more popular than that of the unity of the origin of species. Sir Charles Lyell has very ably shown the remarkable resemblance between the theory of natural selection, and the history of the origin of dialects and languages.

Mr. BLAKE referred to the crushing demolition which had been given by Mr. Crawford of the Aryan theory in the "Transactions of the Ethnological Society." The historical evidences of Aryan migration were of the most flimsy character. With respect to the accounts which had been given by some classical authors of races of mute men, Mr. Blake considered them merely to be evidences of the knowledge of the anthropoid apes possessed by the old travellers. Some domesticated animals, especially the cat and the dog, possessed the capability of expressing their ideas by modulated and, to a certain extent, articulate sounds; and he thought that the difference between such "gift of speech" in the "dumb brute" and in the Veddah of Ceylon was not a great mark of distinction.

The PRESIDENT adjourned the meeting.

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#### ORDINARY MEETING, 22ND JUNE, 1863.

DR. HUNT, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting were read and confirmed.

The Honorary Foreign Secretary announced the election of the following gentlemen:—

*Honorary Fellows.*—Professor Louis Agassiz, Cambridge, U.S.; M. Dareste, Second Secretary Anthropological Society of Paris; Professor Eckhard, Giessen; M. Lartet, Sansan, Dep. du Gers; M. Milne-Edwards, Professor of Zoology, Jardin des Plantes, Paris; M. Pruner Bey, Paris.

*Corresponding Members.*—Baron Brücke, Vienna; M. de Castelnau, Paris; General Bernard Dorn, St. Petersburg; M. Gosse (père), Geneva; M. Gosse (fils), Geneva; Professor Giglioli, Pavia; M. Gervais, Montpellier; Professor Leuckart, Giessen; M. Martin Magron, Paris; M. Morlot, Berne; M. Pictet, Geneva; Dr. Reichert, Berlin;

M. Steinhauer, Copenhagen; M. Thomsen, Copenhagen; Professor Welcker, Halle; Professor Worsaae, Copenhagen.

*Local Secretaries Abroad.*—M. Camille Bertrand, Montpellier; G. E. Fenwick, M.D., Montreal; Professor M. Giraldés, Paris; Professor Hincks, Toronto; Professor F. Miklosich, Vienna; Dr. Phœbus, Giessen; Professor Raimondy, Lima; Dr. Schaaffhausen, Berne; Dr. Julius Schwarcz, Stuhlweissenberg, Hungary; Dr. Wienecke, Batavia.

Mr. C. C. BLAKE, Honorary Secretary, read the following list of Fellows elected since the last meeting of the Society:—George North, Esq., 4, Danes-inn; Rev. W. W. La Barte, Lexden, Colchester; W. F. G. Benson, Esq., 115, Kensington, Liverpool; George Witt, Esq., 22, Princes Terrace, Kensington.

The following presents, received since the last meeting, were announced, and thanks voted to the respective donors:—Three casts of the Macousi Indians of Guiana, presented by Dr. Canton; photographs of a Patagonian Chief, and of the son of the Queen of Tahiti, by Mr. Helsby, of Liverpool; various pamphlets by Dr. Beke, Dr. Hunt, and Mr. C. C. Blake.

Mr. W. WINWOOD READE read the following communication *On the Bush Tribes of Equatorial Africa.*

“I shall offer you a few remarks upon the subject of Equatorial Anthropology in Africa, and shall be happy to answer any questions you may choose to put to me as well as lies in my power.

Equatorial Africa is a country of virgin forests, mountainous, and well watered by rivers. There are no large plains, but here and there are found small prairies among the forests, and there is an abundance of swampy land.

The M'pongwe which inhabit the mouth of the Gaboon have become tolerably civilized by their contact with white men. It will be more interesting to consider that branch of the tribe which inhabit the Fernand Vaz, and who are called *Commi*. There are three more important bush tribes, viz., the Shekani, the Bakali, or Bakëlë, and the Bafanh, better known as the Fans.

There is nothing of importance to distinguish the *Commi*, the Bakëlë, and the Shekani from one another. The *Commi* are the most polished, the Bakëlë are possibly the rudest, but that, of course, depends much upon circumstances; there is little real difference between them. The constitution of these tribes is that of the Veddahs of Ceylon, and is one, I believe, that is common to most savage people. They live in families or clans, over which a head man, or patriarch, presides. This head man has influence, but no authority. He is usually the oldest man of the clan. The women, of course, do all the hard work, excepting that which is beyond their strength, as cutting down trees to clear a plantation, or which, like hunting and fishing, is beyond their skill. There is nothing by which the wives of these people can be distinguished from their slaves; in fact, they are slaves. The man who wants a wife buys her from her father with so much cloth, tobacco, etc. It is true that he is not allowed to kill her; but even if he did so, he would be allowed to escape with a slight fine. Those who are rich, of course, have

several wives. Indeed, the only way in which a man can invest his money is in wives and slaves.

Circumcision is common to the equatorial tribes, but I have not heard of that operation among them which is performed on the women of Senegambia; it *may* exist, but it did not come under my notice. There are initiatory rites both among the men, and also among the women, like those of the Bona Dea. And it is very curious that in this last there is a custom resembling that of the vestal fire which was never suffered to go out. The men are severely flogged when initiated, and one of the fetish men makes curious noises from behind some kind of shrine. They worship wood spirits, lake spirits, mountain spirits, and they invoke the shades of their ancestors. They believe that there exists an unknown, unseen God, who is beneficent, and who has created all things. They also believe in the Evil Genius.

Manchester cloth is common enough in those parts of the country where a white man has never been, and that is the ordinary dress, fastened below the breasts, and falling to the ancles. Up the Fernando Vaz a very elegant grass-cloth is made. Among the Fans it is made from the inner bark of a tree, or sometimes a mere covering of goat-skin. I have seen people merely covered with fresh palm-leaves, but that is very rare. Little girls are not allowed to wear any clothing till they arrive at the age of puberty. This custom seems to prevail all over Africa, and Columbus observed that it was common to savage nations.

Respecting the Fans, I have little to add to the full and excellent paper which Consul Burton has written upon them. I do not think he has mentioned that they have an iron currency among them, consisting of small strips of iron made up into bundles, and this distinguishes them from the other bush tribes of Equatorial Africa. So does their cannibalism, of which I, for my part, have not the slightest doubt. The evidence of the neighbouring tribes is unanimous upon that matter; and a Fan whom I questioned through interpreters told me with his own lips, that he had ate man himself: that it was like monkey, and very good; that only the old men had the privilege of eating it; and that the head fell to the chief or patriarch. He said that they always ate prisoners of war; and that sometimes people condemned to death for sorcery were eaten. He denied that they ate the bodies of those who died among them: that, therefore, must remain a matter of doubt; but respecting the custom of cannibalism, I cannot see why there should be any doubt about that at all.

On one point I differ from Capt. Burton. He says that wild cattle are abundant, and that the Fans have plenty of meat, and are not pushed to cannibalism by a craving for meat. I do not pretend to say whether they are or are not. But wild cattle are only found in the neighbourhood of prairies, that is to say, in any number, and most of the Fan country is virgin forest, where, as every scientific man knows, animal life is exceedingly rare, because air and light are shut out, and the growth of herbage is not sufficient for those animals which graze. It does very well for apes and elephants, who can feed on the leaves

of trees. The staple diet of the bush tribes of Equatorial Africa consists of plantains and cassada. I do not think that they ever eat fowls, and sheep only on gala days. Upon these points I think that Captain Burton has been misinformed. But I know that Captain Burton went into the Fan country, while I was up the Muni; and in all other particulars his description is extremely minute and correct.

Upon the question of tribes becoming extinct, I can support Captain Burton's assertion. Dr. Livingston has had too little experience in Western Africa to be an authority upon that question. The M'pongwe tribe itself is fast dying out, and large clans or families have become extinct within the memory of old men.

I feel certain that the natives of Equatorial Africa are not aborigines. They have among them many vestiges of a higher state of civilization, and it is probable that they have been migrating during ages towards the west. When they arrive at the sea-board the type begins to change. The complexion from tawny becomes black; the hair becomes less abundant; the lips thicken; and, in fact, they become typical Negroes—a race of men which have been falsely put forward as types of the African, but which are exceptional beings found only on the swampy banks of the African rivers, or in fenny places. I have occasionally heard of a stunted race of men found in the interior, which are, probably, the real aborigines and which may occupy the same place among these tribes as do the Hottentots among the Kaffirs. The Fans, as they told me, have migrated from the north-east. I afterwards visited the Fulahs of Senegambia, and I was so struck with their resemblance in physiognomy and in their habits and manners generally, that I cannot help thinking that the Fans are an offshoot of this great nation who have extended their conquests to the Niger. I shall publish ere long a complete description of these people, and also a very good vocabulary of the Fan, the M'pongwe, and other dialects of Equatorial Africa. The comparisons of languages, of the *construction* of languages is our only sure guide in tracing a people to their origin. With respect to the gorilla—for I suppose that there are some of us here who are not ashamed to own him as an ancestor, I can inform those gentlemen who are studying the ape-origin of man that as far as the habits of the gorilla are concerned he differs in no respect from the chimpanzee. It is, perhaps, worth while observing, that both these apes build nests as lying-in-hospitals for their females—a fact which I believe has not been made public. They are simply rude layers of sticks and branches. The chimpanzee has also the character among the natives of being more intelligent than the gorilla; in a state of captivity both are equally docile.

Mr. WINWOOD READE then proceeded to give a description of the exceedingly interesting objects collected by him in Western Africa, and which he has presented to the society.

Mr. A. A. FRASER. In the Pacific as in Equatorial Africa, wives are regarded almost like beasts of burden, but the light race treats its women very much better than the dark race. There are also great ceremonies in celebration of the arrival of young men at maturity, the

principal ceremony being the investiture of the young man, who stands on the body of a man murdered for the purpose, with his clothing. Mr. Fraser considered that the true cause of the varieties of colour in man are not at all understood. In the Fiji islands black and light races are found under identical circumstances of heat, soil, and moisture.

Mr. AVERY inquired what the traces of superior civilization in Western Africa, to which Mr. Reade had alluded, were. Mr. Avery attributed great influence in the production of race to local influences, and referred to the North Devon breed of cattle, which is, he is informed, peculiar to North Devon, and cannot be preserved in other parts of the country. Mr. Avery also inquired whether the tribes of Equatorial Africa have any code of morals.

Mr. BOUVERIE PUSEY inquired where the Cuban slaves came from.

Mr. C. C. BLAKE thought that the investigation of the relations between geology and ethnic distribution would be a matter of great interest, and would throw great light upon many problems of general anthropology. Mr. Blake also alluded to the great structural and moral differences which exist between the Negro and European, and stated that Mr. Reade's observations entirely justified the strong opinions on these points expressed by Captain Burton.

Mr. WINWOOD READE said, in reply, the slaves of Cuba come now from the Congo; there the typical Negro is found. The slaves are the most degraded of the people. It is a mistake to suppose that the prevalent type of the inhabitants of Western Africa is that of the Negro. Negroes are confined to the banks of rivers and to marshy places; in mountainous districts the people are tawny. There can be no doubt of the extinction of tribes in Equatorial Africa, and it appears to be chiefly attributable to the constant tide of migration towards the coast, the climate of which is so fatal both to Europeans and natives; the principal other causes are early marriages and the abuse of young children. The traces of a superior civilization to which I referred, are chiefly traditions, the customs of burning a sort of vestal fire when the women are initiated, and the language being of a character far too perfect to have originated among a totally uncivilized people. To the question whether these people have any code of morals, I answer, yes. Adultery is punishable by slavery or death. The women sometimes entice the young men for the purpose of betraying them to their husbands, who sell them and divide the profits with their wives. The religion of these tribes is of a fetish nature; they believe in a Great Spirit, the Creator of all things, but do not often mention him. As regards the influence of civilized man on the Negroes, I fear that the only effect of the efforts of the missionaries as yet, has been to make them hypocritical. As regards the cannibalism of the Fans, I entirely agree with Captain Burton. The evidence of the neighbouring tribes is unanimous on the point. I was also assured by a missionary that he had not the slightest doubt of it. The human flesh is not eaten indiscriminately, the women and young men are not allowed to partake of it. I believe that although language is not in all cases an accurate test of race, it will be found to be so in all ex-

cept a few exceptional cases; I think, however, that a good collection of well authenticated crania will be found to be of the greatest service in this respect.

The PRESIDENT thought that language would be found to be but a very uncertain criterion of race, and that such an application of it as suggested by Dr. Latham, viz., the deducing from the percentage of British, Danish, Saxon, and French words found to occur in local dialects, the mixture of races in the different parts of England, would be found to lead to entirely erroneous results. He quite admitted the importance of the study of comparative craniology, and considered that photographic representations of typical specimens of different tribes would also be found specially valuable.

Dr. BERTHOLD SEEMANN: In the determination of race the examination of the skull is not sufficient; it is absolutely necessary, in many cases at least, to see the soft parts. I myself should like to see in London an anthropological garden, something on the same principle as the Zoological Gardens, where living specimens of the principal varieties of the human race might be seen and compared. I do not think language a test of race. In Germany, a hundred years ago, Slavonic was extensively spoken, but has now entirely disappeared. Similarly the Wendic is almost extinct, although it still lingers in some of the villages of Saxony. The influence of climate on race appears to be considerable. Cattle taken to America become so stupid that they lose the instinct of self-preservation, and the trains on the American railways are obliged to be provided with cattle catchers, as the animals will not get out of the way.

Mr. AVERY suggested that missionaries should be furnished with blank forms of questions on anthropological subjects. Although not men of sciences they would, he felt sure, be above all men both able and willing to afford accurate information.

Mr. C. C. BLAKE: The Anthropological Society of Paris have sent questions to travellers, but have received few answers. A most able and elaborate series of questions for travellers proceeding to Peru was prepared by that society, but very little has resulted from it. Missionaries will, of course, be eligible for Local Secretaries, but the council will be guided in their selection solely by the qualifications of the candidates.

Dr. BERTHOLD SEEMANN: Missionaries are on the whole not trustworthy, as they are not independent agents; but Ellis and Turner must be mentioned as great exceptions. The reports of the missionaries are also, after their receipt in this country, very much altered and modified, to suit the tastes of the English public.

Mr. WINWOOD READE: My own experience of equatorial Africa is, that the only reliable information is to be got from the missionaries. I refer more especially to the American missionaries, who are specially educated for their work. Many of them take great interest in science. Mr. Mackie, of Corisco, was making a collection of fishes for the Smithsonian Institute, when I was at the Gaboon.

The PRESIDENT stated that the Honorary Foreign Secretary would be happy to receive the names of gentlemen for local secretaries abroad, and adjourned the meeting.

## GENERAL MEETING, JULY 7TH, 1863.

DR. HUNT, PRESIDENT, IN THE CHAIR.

THE Provisional Council appointed at the public meeting of the 6th January, 1863, presented the following report to the meeting:—

“At the first and only general meeting of the society, certain gentlemen were appointed officers and council, to carry out the objects of the society. In accordance with this resolution, the Council now reports to the society the success which has attended its efforts.

“*Meetings.*—Eight ordinary meetings of the society have been held.

“The following papers have been read before the society:—

“Feb. 24—Dr. James Hunt, President, ‘On the Study of Anthropology.’

“March 24—Captain R. F. Burton, Vice-President, ‘A Day amongst the Fans;’ Professor Raimondi ‘On the Indian Tribes of Loreto, in North Peru.’

“April 7—R. T. Gore, Esq. ‘On a Case of Microcephaly.’

“April 21—Alfred Tylor, Esq. ‘On the Discovery of Supposed Human Remains in the Tool-bearing Drift of Moulin-Quignon;’ Dr. Julius Schvarcz ‘On the Permanence of Type;’ C. S. Wake, Esq. ‘On the Relations of Man to the Lower Animals.’

“May 12—W. Bollaert, Esq., Past and Present Populations of the New World;’ Professor John Marshall ‘On a Case of Microcephaly.’

“May 26—Professor George Busk ‘On the Human Remains from so-called Brick Earth, at Luton, near Chatham, contributed by the Rev. H. F. Rivers.’

“June 9.—T. Bendyshe, Esq. ‘On Human Remains found at Barrington, in Cambridgeshire;’ R. S. Charnock, Esq. ‘On the Science of Language.’

“June 23.—W. Winwood Reade, Esq. ‘On the Bush Tribes of Equatorial Africa.’

“These meetings have been well attended; while many members and visitors have taken part in the discussions.

“*Publication.*—The Council have for the present made arrangements with the proprietors of the *Anthropological Review* for inserting the official reports of the society’s meetings; and have also engaged to place at the disposal of the editors those papers which are not required for the volume of memoirs. In return for inserting the official reports of the society the Council have engaged to take one number of the *Review* for each member of the society, at trade price. This arrangement will continue as long only as it is mutually agreeable; and the Council are in no way bound to continue it.

“*Fellows.*—One hundred and ninety-eight fellows have been elected.

“*Honorary Fellows.*—Twenty-five honorary fellows have been elected.

“*Corresponding Members.*—Seventeen gentlemen have been elected corresponding members.

“*Local Secretaries.*—Seventeen gentlemen have been elected local secretaries in Great Britain, and eleven abroad.

“*Museum.*—Several objects of great interest have been presented

to the society, amongst others the nearly perfect skin of a large male gorilla, by Mr. Winwood Reade; and the Council think that great attention should be paid to this department, as soon as the funds will permit.

*Translations.*—The Council have made arrangements to print this year the first part of Dr. Waitz's 'Anthropologie der Naturvölker,' which is now in the press.

*Committees.*—Only one committee for a special scientific object has been appointed, and at present it has not rendered any report.

"The Council recommend that the present general meeting should be especially devoted to a consideration of the rules of the society. At the first meeting it was proposed 'that the rules be formed on the plan of the Geological Society.' The Council have proposed certain rules in accordance with this resolution, which they now lay before the society for their consideration.

"The first meeting of the society was attended by a very limited number of gentlemen, and as the society now contains ten times as many members as it did on that occasion, the Council deem it expedient that a re-appointment of the officers and Council should now take place, in accordance with the rules of the society.

"The Council have prepared a list of officers and Council, which they nominate for election.

"Signed on behalf of the Council,

"JAMES HUNT, *Chairman.*

"July 7, 1863."

Dr. HUNT moved and Mr. S. EDWIN COLLINGWOOD seconded the adoption of the report. The motion was carried unanimously.

The draft regulations proposed by the Provisional Council were then read, and, with some modifications, passed.

The meeting then proceeded to the election of officers and Council, in accordance with Article 5 of the Regulations.

The following gentlemen, proposed by the Provisional Council, were unanimously elected:—

*President.*—Dr. James Hunt.

*Vice-Presidents.*—Captain Richard F. Burton, Sir Charles Nicholson, Bart., and the Duke of Roussillon.

*Honorary Secretaries.*—C. Carter Blake, Esq., and J. Fred. Collingwood, Esq.

*Honorary Foreign Secretary.*—Alfred Higgins, Esq.

*Treasurer.*—R. S. Charnock, Esq.

*Council.*—Rodolph Arundell, Esq., T. Bendyshe, Esq., W. Bollaert, Esq., S. Edwin Collingwood, Esq., Dr. George D. Gibb, Henry Hotze, Esq., Dr. J. Hughlings Jackson, J. Norman Lockyer, Esq., Edward Pick, Esq., W. Winwood Reade, Esq., C. Robert Des Ruffières, Esq., William Travers, Esq., W. S. W. Vaux, Esq., and George Witt, Esq.

*Resolved,* on the motion of Dr. HUNT, seconded by Mr. BLAKE, "That the thanks of the Society be given to George Byham, Esq., and W. Spencer Cockings, Esq., for their services, as scrutineers."

*Resolved,* on the motion of Mr. BLAKE, seconded by Mr. S. E.

Collingwood, "That the thanks of the Society be given to the President, for the manner in which he has advanced the interests of the Society during the past half-year."

*Resolved*, on the motion of Dr. HUNT, seconded by Mr. C. ROBERT DES RUFFIERES, "That the thanks of the Society be given to the officers, for their services during the past half-year."

The meeting was then adjourned.

### ORDINARY MEETING, 7TH JULY, 1863.

DR. HUNT, PRESIDENT, IN THE CHAIR.

The minutes of the preceding meeting were read and confirmed. It was announced that the following gentlemen had been elected since the last meeting:—

*Fellows*.—Dr. Henry Lonsdale, Carlisle; T. J. Hutchinson, Esq., H.M. Consul, at Rosario.

*Corresponding Members*.—M. Deanoys, Paris; Professor Steenstrup, Copenhagen.

*Local Secretary Abroad*.—Dr. Anton Fritsch, Director of the Museum, Prague.

*Local Secretaries in Great Britain*.—H. A. Chignell, Esq., Brighton; T. R. Fairbank, Esq., M.D., Manchester; C. A. Rolph, Esq., Wolverhampton; Frederick Travers, Esq., Poole.

The following presents were announced, and the thanks of the society voted to their respective donors:—"Roman remains from Cirencester," presented by A. A. Fraser, Esq. "On the Diseases of the Nervous System," by Dr. Hughlings Jackson, presented by the author. "Copies of the Memoirs on the occurrence of human evidences in the Pliocene bed of Chartres," by the author, M. Desnoyers. Professor Rudolph Wagner's "Bericht über die Arbeiten in der Allgemeinen Zoologie in Jahre, 1862," by the author. Wiltshire, "On Flint Implements," by Alfred Stair, Esq.

Letters were read from Professors Rudolph Wagner, of Göttingen, and Theodor Waitz, of Marburg, returning thanks for the honour conferred upon them in electing them Honorary Fellows of the Society.

The following communication was read:—

*On Recent Evidences of Extreme Antiquity of the Human Race*. By C. CARTER BLAKE, Esq., F.G.S., Honorary Secretary of the Anthropological Society of London, and Foreign Associate of the Anthropological Society of Paris.

Although the subject of the following remarks is one on which I can offer no original information, yet the interest which Members of the Anthropological Society feel in all subjects connected with the antiquity of the human race, and the startling nature of the facts that have been recently laid before the Paris Academy of Sciences, by M. Desnoyers, have led me to offer these brief remarks on a discovery which, if true, would carry back the antiquity of the human race to a period far more ancient than that at which the drift strata of the

Somme valley were deposited, and coeval with the existence of extinct mammalia, belonging to the pliocene period.

(The previously known most ancient evidences of human remains and works of art were briefly recapitulated.)

On the 16th of May, 1860, M. Lartet, well known as one of the most accomplished palæontologists of Europe, in a letter to Mr. Leonard Horner, the President, laid before the Geological Society of London the evidences which led him to infer the probable coexistence of man with entire quadrupeds, proved by fossil bones, from various pleistocene deposits, bearing incisions made by sharp instruments. The bones so described consisted of remains of aurochs (*Bison priscus*), of large-horned deer (*Megaceros Hibernicus*), of stag (*Cervus Somonensis*), of common stag (*Cervus elaphus*), and of rhinoceros (*tichorhinus*). The inferences which M. Lartet drew were that these bones had been transversely cut across by some instrument having transverse inflections, such as by the roughly chipped flint hatchets of St. Acheul. The conclusions of M. Lartet were accepted, I believe, by the majority of the members of the Geological Society present; and while accepting them myself, I shall content myself with placing on the table the original memoir of this distinguished palæontologist. (*Quarterly Journal Geological Society*, vol. xvi, p. 471.)

We have thus unequivocal evidence that it is possible to find in deposits of pleistocene age, remains of bone of various animals extinct and recent, characteristic of the deposit, and that the incisions which are made by the flint implement or flint flake bear definitely recognizable characters which are susceptible of accurate and logical definition in the hands of so accomplished a palæontologist as M. Lartet.

The evidences which have been afforded to M. Desnoyers are referable to a far more distant period of geological time. To define, however, accurately, so far as in the present state of our knowledge we can venture so to do, the horizons at which the respective beds lie, in which these evidences of the rejected *débris* of human food are found, with extinct animals, we must venture to some extent into geological, and even into palæontological details; and I would therefore, entreat your indulgence while I briefly define in a general manner the zones of geological distribution of a few of the extinct pachyderms. Anthropology, in a case like the present, has a right to lean on geological evidence.

Three principal species of European fossil elephant are known. The *Elephas primigenius*, the *Elephas antiquus*, and the *Elephas meridionalis*. The mammoth (*Elephas primigenius*) has been discovered in postpliocene gravels in Northern Europe; and in the cave deposits. Its oldest known examples have been derived from the forest-bed of Norfolk. It thus survived through the period of the glacial drift. The *Elephas antiquus* has been found in the pliocene gravel of the Thames valley; in the caves of Kirkdale and Kent's Hole; in the Norfolk forest-beds; in the St. Acheul gravels. The *Elephas meridionalis* is to be found in the forest-bed of Norfolk, in the Norwich crag, in the deposits of the Val d'Arno; and at Saint-Prest, near Chartres. Several species of *Rhinoceri* are characteristic of later tertiary beds. Former palæont-

ologists only distinguished two, the *Rhinoceros tichorhinus* and the *Rhinoceros leptorhinus*. But the researches of Dr. Falconer have led him to divide the latter species into three. *Rhin-megarhinus* is known to us from the gravels at Gray's Thurrock and other localities. *Rhinoceros hemitachus*, according to Sir Charles Lyell, accompanies *Elephas antiquus* in most of the oldest British bone caves, such as Kirkdale, Cefn, Durdhan Down; Minchin Hole, and the Gower caverns. It has been also found at Clacton, and in Northamptonshire. *Rhinoceros siruscus* is the characteristic species of the Val d'Arno deposits; the forest-bed, and the superimposed blue clays with lignites of the Norfolk coast, nowhere as yet in the ossiferous caves of Britain. *Rhinoceros tichorhinus* is a characteristically drift species, and throughout its distribution associated with the mammoth *Elephas primigenius*.

M. Laugel has in the Bulletin of the Paris Geological Society, minutely described the bed of Saint Pree, near Chartres, as a characteristically pliocene stratum. The presence of *Elephas meridionalis*, of *Rhinoceros leptorhinus*, *Hippopotamus major*, many large species of stag, ox, horse, resembling that of the Val d'Arno, leave no doubt on the minds of palæontologists respecting this fact. Should any such exist, the fact, to which M. Desnoyers triumphantly points, that some of the remains from this bed have been examined by M. Lartet and Dr. Falconer, who unite in their interpretation as pliocene, render further objection as to the absolute identity of the fossils with those bearing the reputed names superfluous. So far the palæontological evidence.

In a geological point of view the beds, according to M. Desnoyers, closely resemble those of the Val d'Arno. It is composed of variously coloured sands, sometimes ferruginous, sometimes white, either pure or mixed with clay, with flint pebbles from the chalk, broken and rubbed, with some boulders of tertiary sandstone, termed *ladères* in the neighbourhood of Chartres. Sands formed the middle and lower parts of the beds, pebbles were found mixed therewith; both were presented in waved strata, and in alternate masses very irregularly repeated, and variously inclined, throughout a thickness of at least twelve to fifteen metres. These sands and pebbles are covered by a thick deposit of *löss*, and of more recent drift deposit (*terrain de transport*). They overlie conformably the chalk of which they fill the depressions, and from which they are separated at their base by a bed of large flints, which may represent a part of the flinty clay of the Perche.

M. Desnoyers, in the interesting memoir from which I have quoted the above facts, states that the workmen excavating the bed found remains, especially of rhinoceros, of which the following peculiarities presented themselves. I quote his own words. "I was struck, when partially removing the sand which covered the tibia of rhinoceros, to see striæ, varying in form, in depth, and in length, which could not be the result of breakage or drying, of which evidences were also visible, because they were evidently made anterior to such destructive powers, whilst they cut the bone transversely to its axis, and even passed above its ridges, following the line of its contour.

These striæ, or traces of incisions, very clean cuts, some of them very fine and very smooth, the others much larger and more obtuse, as if they had been produced by flat or notched plates of flint, were accompanied by small elliptical cuts or scratches, sharply characterized, as if they had been produced by the contact of an acute instrument." These cuts were partially covered with ferruginous *dendrites* and with sand, and their edges were slightly bouldered. M. Desnoyers considers them perfectly analogous in signification to the incisions which have been frequently recognized on the bones of the fossil cave mammalia, in the drift deposits, in peatbeds, and even in far more recent deposits, as the Gaulish, Gallo-Roman, and Germanic tombs.

M. Desnoyers, unwilling to arrive at any hasty conclusion, searched if analogous evidences could be found in the many collections from the same locality, in various private hands, and some of which had been excavated so long ago as 1849. I shall not here enter into the particulars of this detailed investigation; it may suffice to say that more than one hundred specimens were investigated, all of which presented the same characters. M. Lartet assisted M. Desnoyers in his investigation, and verified the following species of extinct mammalia, as affording evidences of cuts made by man on the bones:—*Elephas Meridionalis*; *Rhinoceros leptorhinus*; *Hippopotamus major*; *Cervus*, many species; *Megaceros Carnutorum* (Laugel); *Bos*, a large species; *Bos*, a small species. Other analogous evidences were observed. Thus, on the skull of *Elephas meridionalis*, from the same bed, in the Paris Museum of Natural History, traces can be observed of arrows which appear to have glanced away from the osseous matter, after having traversed the skin and the flesh; the impression of the acute triangular cavity left by the point of the arrow, and the serrated marks left by its edge are even visible. These marks, according to M. Desnoyers, are very different to those which are left as impressions of the teeth of carnivora, or as the marks of floating ice. The skulls of the large deer all exhibit one remarkable peculiarity. They appear to have been broken near the base of the antlers by a violent blow on the frontal bone, as in some of the ruminant skulls described by Steenstrup, from the Danish deposits. Other traces of knife-action are visible on the skulls of deer, and on the antlers. Lastly, and more rarely, bones of ruminants are found in the same beds, split open parallel with their axis, so as to extract the marrow. Such bones are common in the sepultures of the stone, bronze, iron, and Roman periods. I now exhibit a specimen from a Roman cemetery, kindly presented by one of our members, Mr. Fraser, to the society.

Besides these striations on the bones, which M. Desnoyers and M. Lartet concur in, referring unequivocally to human action, there are others to which the same origin is not assigned by them. Thus there are striæ exceedingly fine, exceedingly regular, many centimetres in length, and intercrossed by others equally clean and regular. The two French palæontologists are inclined to refer this description of marking to the agency of sand contained in blocks of ice, analogous to the markings on the scratched boulders, which are so familiar to every tertiary geologist.

I briefly recapitulate M. Desnoyers' conclusions.

1. That the fossil bones of *Elephas meridionalis*, *Rhinoceros leptorhinus*, *Hipp. major*, many large and small deer, many species of ox and other mammalia, considered as characteristic of the upper tertiary or pliocene beds, and discovered in an undisturbed deposit of this geological period, bear numerous and incontestable traces of cuts, striæ, and notches.

2. These markings are perfectly analogous to those which have been observed on the fossil bones of other more recent species of mammalia, some extinct, and accompanying the *E. primigenius*, the *R. tichorhinus*, the *Hyæna spelæa*, and others living at present, such as reindeer, many deer, the aurochs, found in osseous caverns and the drift or diluvian deposit. Similar vestiges can be seen on numerous bones of recent species found in building excavations, or in Gaulish, Gallo-Roman, Breton, or Germanic tombs.

3. The marks authenticated on the most ancient bones appear to have been, in a great part, of the same origin as those on the more recent bones, and can at present be only attributed to the action of man.

4. Other finer, more rectilinear and decussating, striæ, which are seen in great number on the bones for the pliocene beds of the environs of Chartres, and other localities, appear to be analogous to those which are observed on the boulders and pebbles, scratched, graven, and polished, of ancient and modern glaciers. The agitation due to torrential waters might scarcely have produced a similar result.

5. The section at St. Prest, in the environs of Chartres, unanimously recognized as upper tertiary or pliocene, and certainly as anterior to all the quaternary deposits which contain *Elephas primigenius*, presents numerous bones of *Elephas meridionalis*, and of many of the large species characteristic of the upper tertiary beds, on which are remarked the two descriptions of striation and marking.

6. From these facts it appears possible to conclude, with a great appearance of probability, until some more satisfactory explanation may clear up this double phenomenon, that man has lived on the French soil before the great first glacial period, at the same time as the *Elephas meridionalis* and the other pliocene species, characteristic of the Val d'Arno in Tuscany; that he has been in conflict with these great animals anterior to the *Elephas primigenius*, and the other mammalia of which the remains have been found mixed with vestiges or indications of man in the drift or quaternary deposits of the large valleys, and of caverns.

7. Finally, the bed at St. Prest is at present, in Europe, the most ancient example of the co-existence of man and extinct mammalia in geological time.

Thus far M. Desnoyers' paper.

I shall briefly pass over the principal objections that may be made to M. Desnoyers' discovery.

Firstly, as regards the archæological evidence. Incredulity may no doubt be provoked at the allegation that we can detect such traces of knife-action on fossil bones. It will be told us, that at the last meet-

ing of the British Association, a distinguished geologist exhibited a whittled bone of mammoth, as he termed it, and pointed out the evidences of what he deemed to be certainly cuts thereon, which cuts were undoubtedly assignable to a much more recent antiquity than that of the deposition of the strata containing elephantine remains. Nevertheless, I think those gentlemen who have had the opportunity of inspecting such a collection as that formed by Mr. Christy, for example, will arrive at the conclusion that an able anthropologist, accustomed to tact and discrimination, may be able to recognize such evidence of incisive or of erosive action, while the evidences which are undoubtedly due to human influence run no risk, when the investigation is sufficiently close, of being confounded with those of the teeth of the predaceous carnivore, or of the grating action of the sand contained in the slowly moving glacier. Our estimate of the vast experience of M. Lartet in this matter is a necessary factor in the conclusion to which we should arrive.

As regards the stratigraphical evidence, a sceptic who reads M. Desnoyers' description of the Saint Prest beds, which contain pebbles derived from the chalk, broken and with the edges rolled, and which also contain boulders of tertiary sandstone, may urge that these are true signs of a real drift deposit, and may allege that the occurrence of human evidences in such a stratum would be but a fact of the same order as the discovery of similar evidence in the Somme valley. Against such an hypothesis, the presence of *Elephas meridionalis* and *Rhin. etruscus*, might be urged in the St. Prest beds, species which have never hitherto been found in any drift deposit. M. Desnoyers, who has actually seen the bed, states that the true drift (*terrain de transport*) overlies the strata containing the chipped bones. Furthermore, the beds in question have long been regarded as newer pliocene, and by a singular coincidence, the example of *Elephas meridionalis* given in Sir Charles Lyell's work copied from Lartet, is selected from these Chartres beds. I therefore think that, unless some unforeseen discovery may be made, there can be no reasonable doubt that the conclusions of M. Desnoyers and Lartet, that the bed in question is truly newer pliocene, is well-grounded.

As regards the palæontological evidence, it may be first denied that the remains are really of *E. meridionalis* and *R. etruscus*. To this argument I think a reply is hardly needed, and the *argumentum ad verecundiam* is sufficient to disprove it. M. Lartet has checked the species with M. Desnoyers, and no palæontologist will be hardy enough to dispute their identification and verification.

It may next be hinted that *Elephas meridionalis* may have had a wider range in time that we have hitherto thought. An objector may allege that the deposit is comparatively of post-pliocene age, and that the *E. meridionalis* may have lived down to post-glacial times; or that meridionalis as a southern species may have lived down to a more recent period in France than here, upon the operation of the palæontological law, which preserves *Unio littoralis*, long since extinct in England, still in existence in Loire. According to such an hypothesis, *E. meridionalis* and *Rhin. etruscus* may have flourished in France,

while *E. primigenius* and *R. tichorhinus* existed in the British and Somme valley post-pliocene deposits. There is much plausibility in this argument. But if we accept the statement of M. Desnoyers, that true drift overlies the Saint Prest beds, the stratigraphical evidence is conclusive. Whatever may be the period at which *E. meridionalis* and *Rhinoceros etruscus* flourished at Chartres, they were preglacial, antecedent to the deposition of the great northern drift. Much light will, however, be thrown on the subject by a minute description of the associated mollusca, which, in the hands of a Searles Wood, or a Woodward, would tell a clear and intelligible story.

On ethnographical grounds it may be urged that a race of men living at such a stupendously distant period of time at which the newer pliocene beds were deposited, could not have arrived at such a degree of civilization as to have used arrows with acute points, and serrated edges, such as M. Desnoyers describes. In the far more recent Somme valley drift, no such complicated instance of man's sportsmanlike ingenuity has been discovered. The nearest approach to the arrowhead from the drift deposits is the simple flint flake. The arrow head belongs to a later period in that locality. I must refer this argument to those who may be more competent to deal with such evidences than myself.

Such, gentlemen, are the few observations which I would make on M. Desnoyers' discovery of the beds. While declining to give any positive opinion on the matter, until further examination shall have been made, I think it will be the opinion of every sincere geologist, that M. Desnoyers has made out a fair *prima facie* case in favour of the existence of man in the Saint Prest beds.

If such should actually have been the case, the student who re-peruses the passage contained in Sir Charles Lyell's *Antiquity of Man*, will be struck with the prescience displayed by the learned author. Sir Charles said, speaking of the preglacial forest bed of the Norfolk Cliffs, belonging to the same great division of geological time as the Saint Prest beds:

"We need not despair of one day meeting with the signs of man's existence in the 'forest beds,' or in the overlying strata, on the ground of any incongruity in the climate, or incongruity in the state of the animate creation with the well-being of our species. For the present we must be content to wait, and consider that we have made no investigations which entitle us to wonder that the bones or stone weapons of the era of the *elephas meridionalis* have failed to come to light. If any such lie hid in those strata, and should hereafter be revealed to us, they would carry back the antiquity of man to a distance of time probably more than twice as great as that which separates our era from that of the most ancient of the tool-bearing gravels yet discovered in Picardy or elsewhere. But even then, the age of man, though pre-glacial, would be so modern in the great geological calendar, that he would scarcely date back so far as the commencement of the post-pliocene period."

Those members of the Anthropological Society who may give credence to M. Desnoyers' conclusions, will feel a certain amount of

justifiable gratification at the confirmation of the generalizations of Lyell, and will endorse his conclusions respecting the antiquity at which the post-pliocene strata were deposited.

MR. CHARLESWORTH: Although the facts just laid before the Society are of the greatest possible interest, the materials for discussion are extremely meagre. The objections which may be made to the conclusions of M. Desnoyers, would relate either to the origin of the markings on the bones or to the age of the beds in which they were found; that the bones have been correctly determined cannot be doubted, seeing they have been examined by men of such eminence as MM. Lartet and Desnoyers. The markings certainly appear to be ancient, as they are sometimes covered by dendrites. They also seem in every respect to resemble the markings undoubtedly caused by human agency on bones found in post-tertiary deposits, in the Kjökenmöddings and in the Pfahlbauten. I have myself seen remains of *Megaceros Hibernicus*, the skulls of which were all broken across the frontal bone, evidently by human hands, exactly in the same manner as those of the large deer described by M. Desnoyers. All such evidence that I have seen, however, is confined to post-tertiary deposits; and, although, as existing animals go down low into the tertiaries, there is no *a priori* reason why man may not do so too, I think too much caution cannot be exercised in rigidly-examining evidence of the existence of man during the tertiary epoch. It is well to bear in mind such cases as that of the Red Crag, a deposit which, though examined by a series of geologists of the highest eminence, was long supposed to be of miocene age, but has recently been proved to be, to a certain extent, a drift deposit. In order satisfactorily to determine the age of the Saint Prest beds, it would not be sufficient to determine a few of the mollusca; a considerable series of such must be examined.

MR. C. C. BLAKE: M. Laugel distinctly pledges himself to the opinion that these beds are pliocene, and he bases his opinion on the fact, that they are overlaid by the drift. It cannot be maintained that the Saint Prest bones have been fractured by hyænas. The long bones are split in the direction of their length, but the hyæna splits bones according to whatever way he first catches hold of them. The uniform splitting cannot but be regarded as an evidence of design. No one would think that the bone from Cirencester presented by Mr. Fraser was fractured without an object. We have no right, when we allow that split bones, associated with remains of recent animals, were acted on by man, to deny that these other bones have been split by man, because they belong to an elephant long extinct, and because the admission would give the human race an antiquity almost incalculable. Any estimate offered us of the lapse of time since *Elephas meridionalis* trod the forests of Norfolk in company with a rhinoceros, which is antecedent to the *Rhinoceros tichorhinus*, must be inadequate indeed.

MR. CHRISTY: Multitudes of fossil bones have been found bearing evidence of the hand of man. If we can carry this evidence back to the aurochs, there seems no reason why it should not be carried back to *Elephas meridionalis*. At the same time I fully concur in the

opinion of Mr. Charlesworth, that we should be most careful how we take a step in advance of our present position.

A letter was read from Professor MARSHALL, requesting that his paper on "Cases of Microcephaly," which was to have been read at this meeting of the Society, might be postponed till the next meeting.

MR. C. C. BLAKE proceeded to make some observations on a skull, the property of HIS ROYAL HIGHNESS THE PRINCE OF WALES, exhibited to the Society, with his royal highness's permission, by Mr. B. Leadbeater, F.L.S., F.Z.S. The skull presented the peculiar characteristic of having an interparietal bone. This character, the "*os Inca*," was first observed by Dr. Bellamy in the skulls of the early Peruvians. Professor Tschudi considered it as a mark of the primeval distinction of the Peruvian race, the skulls of which, according to him, manifested this alleged "embryonic character" as in the lower mammalia. Morton observed it in a Chimu (called by him Chimuyan), and in a Cayuga skull. In the British Museum is a large handsome skull, belonging to the "Chincha" type, in which the interparietal bone is manifest. In Mr. Edward Gerrard's most useful and valuable catalogue the locality is marked as from Pasadama (*i.e.* Pachacamac), near Lima. In the collection of the Royal College of Surgeons, on No. 5711 (a Laplander), Professor Owen remarks, "The suture between the exoccipital and supraoccipital is retained on the right side, and partially so on the left." Here, however, there are numerous Wormian bones in the lambdoidal suture. On No. 5390 (a New Zealander), he says, "The upper half of the supraoccipital has been developed as an interparietal from a separate centre, and has united by a complex dentated suture with the lower half of the supraoccipital." A similar conformation exists in a skull from the Roman burial-place at Felixstow, preserved in the Anatomical Museum at Cambridge, and in the cranium of a Bengalee. The law which regulates the repetition of similar characters in skulls of nations aboriginally distinct is termed by Professor J. Aitken Meigs, of Philadelphia, "homiokephalic representation." Analogous congenital varieties or imperfections may be seen in almost every ethnic type. Dr. Williamson has described them in the Albanian, Singhalese, Timmani, Kosso, Krooman, Fanti, Ashantee, Calabar, Burmese (Malay), and Esquimaux; whilst in the Limbu tribe from Nepál an instance has been described by Professor Owen, in which the "interparietal" is divided into three distinct *quasi*-symmetrical portions. Dr. Spencer Cobbold has seen a true interparietal bone in a skull in the Edinburgh Museum.

DR. THURNAM remarked on the peculiar shape of the interparietal bone in this specimen, as there was synostosis between the interparietal and the parietal. Instances of true interparietal bones were not so uncommon as had been considered.

The PRESIDENT adjourned the session of the Society till November.

J. W. M.T.