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1908.

ORDINARY GENERAL MEETING

WAS HELD IN THE ROOMS OF THE INSTITUTE,
ON MONDAY, DECEMBER 9TH, 1907.

LIEUT.-GEN. SIR H. L. GEARY, K.C.B., IN THE CHAIR.

The Minutes of the previous Meeting were read and confirmed and the following candidates were elected :—

ASSOCIATE.—Rev. J. Abbot Winfield, Canada.

LIBRARY ASSOCIATE.—Rugby School Library.

The following paper was read by the Secretary in the absence of the author :—

PRIMEVAL MAN IN BELGIUM.

By Rev. D. GATH WHITLEY.

1. *Esquisse Géologique du Nord de la France, et des contrées voisines.* Par M. J. Gosselet. (Lille, 1903.)
2. *Explorations Scientifiques des cavernes de la vallée de la Mehaigne.* Par Julien Fraipont et F. Tibon. (Bruxelles, 1889).
3. *La Race Humaine de Néanderthal ou de Canstadt en Belgique.* Par Julien Fraipont et Max Lohest. (Paris, 1886.)
4. *L'Homme pendant les Ages de la Pierre, dans les environs de Dinant-sur-Meuse.* Par E. Dupont. Deuxième Edition. (Bruxelles, 1873.)

THIS Antiquity of Man is a subject which has come prominently to the front during the last fifty years, and the interest excited by it shows no sign of diminishing. Since Sir Charles Lyell wrote his classical work* dealing with the question, many able geologists have investigated the matter, both in England and on the Continent, as well as in America; and in no country have more important results been obtained than in Belgium. Notwithstanding its insignificant size, Belgium has played a most important part in the history of Europe, and its testimony to the Antiquity and Condition of

* *The Geological evidences of the Antiquity of Man.* 1st Edition, 1863.
c 2

early Man is of such a valuable character, that geologists from all countries have always considered that it is necessary to visit Belgium and confer with its geologists before they are fully qualified to come to definite conclusions relating to the age of Man upon the earth. Sir Charles Lyell himself thought it necessary to visit Belgium before he discussed the antiquity of Man in the light of the discoveries which had been made in the gravel beds of the valley of the Somme.*

The great importance of Belgium in questions relating to Primeval Man, is determined from two striking facts. The first is that it contains a wonderfully perfect series of the Quaternary deposits. These beds of sand, clay and gravel, which were formed after the appearance of Man upon the earth, are spread out in Belgium over a vast extent of country, and are therefore easily examined. In addition to this, the limestone rocks of Belgium are full of caverns, which contain the remains of the great extinct mammalia, and also the bones and weapons of Man. No country in the world presents such a splendid series of bone-caves affording evidence as to the early condition of Man in Belgium. Professor Dupont himself has explored more than sixty caverns in seven years, and the Belgian geologists are prosecuting the work with the greatest skill and enthusiasm. From the time when Schmerling began to explore in a scientific manner the caverns near Liège in 1833, down to the present day, the work of investigation has been unceasingly carried on, and has yielded most valuable results.

According to M. Dupont, the oldest portion of the Quaternary formation in Belgium is composed of a thick bed of rolled pebbles, averaging in size a hen's egg, and immediately over the pebbly deposit, lie stratified sands and clays.† In this deposit are found quantities of the bones of the lion, hyaena, elephant, and rhinoceros. As a rule, this bed of pebbles is only found in the bottom of the valleys, and thins out on the lower slopes of the hills; here and there, however, it is found in patches on the uplands and on the plateaux,‡ where it contains the same fossils as characterise it in the bottom of the valleys. Next in ascending order, comes a vast deposit of yellow clay full of angular blocks, which covers hill and dale, and envelops the

* *Quarterly Journal of the Geological Society*, vol. viii, pp. 277-281.

† *Etude sur le Terrain Quaternaire des vallées de la Meuse et de la Lesse*, pp. 37-39.

‡ See the opinion of M. Rutot in *Bulletin de la Société Royale Malacologique de Belgique*. Tome xvi, 1881.

country like a gigantic winding-sheet. Over this, again, lies the Loess, an enormous deposit of calcareous clay, which is spread over every part of the country except the bottom of the valleys, and is also extensively developed in the valley of the Rhine. The most recent of the Quaternary formations in Belgium is a great deposit of sand, which is clayey towards the bottom, and shifting and movable near the surface, and which is known by the name of the "Campinian Sand." Now, all these different deposits belong to the same geological era, for they all contain the *same remains*; the bones of the lion, elephant,* hyæna, and rhinoceros, being found in all the beds, from the pebbly deposit at the bottom of the Quaternary series, to the Campinian Sand at the top. All, then, were formed, successively speaking, at the same geological period. Their thickness varies in different places, for it is rare to find all four members of the series present in the same locality. In the great delta, however, where meet the Rhine, the Escart, and the Meuse, Professor Gosselet tells us that the Quaternary deposits are more than 450 feet thick, on the borders of the Zuider Zee.[†]

Now, how were all these deposits formed, and what were the causes which operated to bring them into their present position, and to spread them out over such a large extent of country? Marine action is out of the question, for the animal remains found in them are nearly all terrestrial, being the bones of the great land mammalia, and such shells as are confined to the land and to fresh water. M. Dupont thinks that the deposit of rolled pebbles which come chiefly from the Ardennes, was formed by the rivers, cutting out their valleys, when they had a vastly greater volume of water, during the early part of the Quaternary Period. This view is, however, quite untenable, for the rolled Ardennaise pebbles are found not only in the bottom of the valleys, but also in patches on the tops of the hills where no rivers could have flowed. Another theory is, that this great pebbly bed is of glacial origin, having been formed by great floods occasioned by the melting of glaciers and ice-sheets, which ploughed out the land, as Belgium slowly rose out of the icy waters of the Glacial Sea. This theory is no better than the former. The Belgian hills were too low to support glaciers of any considerable size, and Professor Gosselet tells us, that all over North-Eastern France, where the Quaternary beds are the same as those in Belgium, no traces of any ancient glaciers

* The elephant referred to is always the Mammoth.

† *Esquisse Géologique du Nord de la France*, p. 3.

can be discovered.* Moreover, the hippopotamus and the mollusk *Cyrena fluminalis* lived in Belgium when the pebbly deposit was forming, and it is impossible to believe that glaciers and ice-sheets covered the country at the time when these inhabitants of warm countries abounded in its rivers. The yellow clay with blocks, is spread all over Belgium, on the hills and in the valleys, and owes its origin to some great and general cause, acting all over the country. Ice is excluded from the reasons just stated, which apply with similar force to the Loess, the distribution of which is as widespread and universal as that of the yellow clay. It has been suggested by many theorists, such as M. Dollfus,† and Professor James Geikie,‡ that the Loess was formed by vast floods which swept over Northern Europe when the great ice-sheets formed during the Glacial Period were rapidly melting; but here again it is clear that such inhabitants of warm climates as the hippopotamus and the *Cyrena fluminalis* could not have lived amidst ice-sheets and frozen rivers.

It is certain that water spread out these great beds of sand and clay, which enwrap Belgium like a vast mantle, and when these deposits were laid down the climate must have been mild and warm. The late Duke of Argyll has acutely pointed out,§ that every great flood leaves as its result, three kinds of deposits, clay, sand and gravel, and that great stones and boulders are rolled along by the tumultuous waters and dropped in all situations. This is exactly what we find in Belgium and Northern France; and as these deposits of sand, clay and gravel, of the Quaternary Period, contain the bones and flint weapons of Man, we are justified in concluding that at the close of the Quaternary Era an extensive flood poured its waters over Northern Europe, drowning the great mammalia and overwhelming Man. This is the theory held by M. Dupont, and it is also the opinion held by MM. Tardy, d'Acy, and Belgrand in France, by the late Sir Joseph Prestwich, and Sir Henry Howorth in England. If this idea is correct—and all geological evidence is in its favour—it proves that the Quaternary beds were formed rapidly. It also indicates that, as these deposits contain the bones and weapons of Man, any attempt therefore

* *Esquisse Géologique du Nord de la France*, pp. 3, 10.

† *Bulletin de la Société Géologique de France*. Tome vii, Fevrier, 1879, p. 325.

‡ *Prehistoric Europe*, p. 162.

§ *Geology and the Deluge*, pp. 21, 22.

to prove the great age of the human race, by assuming the *slow* formation of these deposits, is not to be depended on.

M. Dupont's work,* although lengthy, is divided into only seven chapters. It is well illustrated with maps and tinted engravings, one of which represents the almost perfect skeleton of a Mammoth, found in the province of Anvers in 1860, and now in the museum at Brussels.

The first two chapters are merely introductory, but the third introduces the reader to the subject, because in it M. Dupont discusses the nature of the Quaternary climate, in which geological era, Man first appeared on the earth. At that time M. Dupont thinks that the greater portion of the desert of the Sahara was submerged beneath the sea, which gave rise to moisture-laden winds, and, at the same time, in the North, the sea rolled over Northern Germany, Denmark, and Holland. Thus Western Europe was surrounded by vast expanses of water, which made its climate far more humid than it is now. The summers were mild, the winters warm, and there were no extremes of heat and cold. The rains were tropical in their violence and duration. The rivers were of immense size, rolling along an enormous volume of water, and constantly swollen by tumultuous floods. A luxuriant vegetation clothed the hill-sides and covered the lowlands, mantling the slopes with great forests, and filling the valleys with dense jungles. Along the banks of the rivers and amidst the waters, lived the wild boar, the rhinoceros, and the hippopotamus, whilst the tyrants of the woods were the lion, the leopard, and the hyæna. The elephant roamed amongst the forests, the bear, elk, and musk-ox wandered over the uplands, and troops of wild horses, buffaloes, and reindeer, grazed on the grassy plains. Such was the aspect of Belgium in the Quaternary Period, when Man made his dwelling in the caverns in the limestone cliffs which overhung the waters of the Lesse and the Meuse.

M. Dupont begins his account of Primeval Man in Belgium, by describing the caverns of the Mammoth Age, which he considers to be the earliest part of the Quaternary Period. The caves he first notices are near Montaigle in the valley of the Molignée, and are called *Trou de l'Érable*, *Trou du Chêne* and *Trou du Sureau*. They are filled with fluviatile loam, and contain the bones of the horse, bear, reindeer, rhinoceros, and elephant. In the midst of these are cinders of fires, and human weapons of bone and flint. These last are formed from a flint

* *L'Homme pendant les Ages de la Pierre.*

found only in Champagne, which proves that the men who in those far-distant days hunted the lion and other animals were active hunters. But of all the rock-dwellings described by Dupont, the cave of Goyet is the most interesting. A little rivulet, called the Samson, enters the Meuse near Namur, and on its banks, near the village of Goyet, is situated the cavern.* It contains *five* distinct bone-beds, which are packed full of animals' remains. The number of bones, skulls, and teeth is perfectly amazing, and almost every animal of the fauna of Western Europe at that time is represented. In one bone-bed alone, the skeletons of four lions were found lying side by side. The largest skeleton, which was almost perfect, has been restored and set up for public inspection ; it measured 4 feet in height at the shoulder. The other animals whose remains were in the cave were the elephant (Mammoth), horse, reindeer, wolf, buffalo, hyæna, and rhinoceros, and in addition to these, the bones of the bear were wonderfully abundant. Lying amidst the remains of the hyænas were human bones, as if Man himself had been devoured by these ferocious animals. Flint weapons were strewn about, and a necklace of shells, some of which must have been brought by trade from Rheims in Champagne, was also discovered. The other relics of Man were a bone harpoon of reindeer horn for spearing fish, curiously barbed on both sides, and a curved bone dart also made from the antler of a reindeer. Still more interesting than these relics was a bone instrument, similar to those found by MM. Christy and Lartet in the bone-caves of the Dordogne in the south of France, and called by them " Batons of Command."† They are supposed to have been the sceptres of chiefs ; this is the first that has been found in Belgium. It was smoothed, and pierced with a hole at the larger end, and the figure of a fish was sculptured on one side, and on the other a branch of a tree with leaves was engraved with wonderful skill. The valley of the Lesse, which flows into the Meuse near Dinant, presents a fine series of limestone cliffs, which rise high above the river, and are full of caverns. Of those of the Mammoth Age the *Trou de la Naulette* is the most important. Dupont found that it contained six beds of stalagmite, beneath which, in sand and clay, lay the remains of hyænas, and of the bones of animals

* There are three caves at this place ; the most important is described here.

† Many of these are figured in the coloured plates of *Reliquiae Aquitanice*.

gnawed by them, showing that the cavern was a hyænas' den. A human jaw, of a strange character, lay with the bones.* It was declared to be of a brutal form, and almost ape-like in its peculiarities. M. Hamy, however, has proved that this was a mistake, and that it is merely an abnormal member of a series of human jaws. He also has shown† that it resembles the jaws of many Melanesians now living, so the idea that its possessor was in any way ape-like, must be abandoned. In *Le Trou Magrite*, a cavern in the valley of the Lesse, there lay amongst the bones of the Mammoth, reindeer, hyæna, and rhinoceros, a part of a small human figure carved in reindeer horn, apparently representing a woman. Near it was found a portion of a sceptre of reindeer horn, ornamented with lines and dots, and some fragments of pottery. This last discovery shows that many geologists have fallen into serious error, when they have maintained the Primeval Man in the Palæolithic Age was ignorant of pottery. The fact is that pottery has now been found in many caverns of the Palæolithic Period, both in France and in Belgium, although in England none has as yet been found. M. Fraipont gives a list of the caves in Belgium belonging to the *earliest* or *Mammoth Age*‡ in which pottery has been discovered, specially mentioning the caves of Spy, Engis, and Le Petit Modave. This assumed ignorance of pottery by Primeval Man is, therefore, one of those errors which must be abandoned.

We may now ask, "What kind of men were they who hunted the elephant and rhinoceros, lighted their fires, and made their repasts in the caverns amongst the cliffs overhanging the Belgian rivers"? The first reply to this question is furnished by the Engis skull. This remarkable relic was discovered by Dr. Schmerling about seventy years ago, in one of the Engis caverns in the valley of the Meuse, not far from Liége. It lay amidst the bones of the bear, hyæna, elephant, and rhinoceros, in a bed of loam and pebbles, which was formed at the same time as the oldest deposits in the caves of Naulette and Goyet. Its immense age is undoubted, and Dr. Martin Duncan has declared§ that it and the Naulette jaw were the oldest human remains in Europe at the time he wrote. The

* Some teeth and two human bones were found with the jaw.

† *Précis de Paléontologie Humaine*, pp. 233, 234.

‡ *Revue d'Anthropologie*, Juillet, 1887.

§ *The Student*, vol. iv, p. 259.

skull is figured by Sir Charles Lyell,* who quotes Professor Busk's opinion that it could be compared with the skulls of modern Europeans.

Professor Huxley also says of it: "There is no mark of degradation about any part of its structure. It is, in fact, a fair average human skull, which might have belonged to a philosopher, or might have contained the thoughtless brains of a savage."† The earliest men in Europe were therefore as well provided with brains as are the modern Europeans, and they possessed faculties for using them as powerful as those of the Belgians of the present day. France gives precisely the same testimony, for one of the oldest skulls found in that country is known as the skull of La Truchère, the possessor of which lived with the lion and the rhinoceros. This splendid skull has a cranial capacity of 1,925 cubic centimetres,‡ whereas the average cranial capacity of the modern Parisians is only 1,558 cubic centimetres. Many primeval men, therefore, were much better provided with brains than are their successors in France to-day.

M. Dupont devotes his next chapter to a lengthy description of the men of the Reindeer Period in Belgium. This he considers to be the later part of the Quaternary Era, when the Mammoth had disappeared from Belgium, and the reindeer had become very abundant. But as the Mammoth still lived in England and France, this classification is merely a matter of convenience, and applies to Belgium alone. Both the Mammoth and the rhinoceros lived with the reindeer right down to the end of the Quaternary Period.

The principal caverns belonging to the Reindeer Period are those at Furfooz in the valley of the Lesse, not far from Dinant, and the most interesting of these is the cave of Frontal. In this cavern there was, at the end, a little sepulchral chamber, evidently of natural origin, and in it lay the remains of sixteen human skeletons, the bones of which were mingled in the greatest confusion. Fragments of a large earthenware urn, which had a round base and holes at the sides, lay with the skeletons. This evidently was hung from the roof of the sepulchral chamber, and probably contained provisions for the dead. Two plates of sandstone were found near by, one covered with strange markings which may have been intended

* *The Antiquity of Man*, p. 81.

† *Man's Place in Nature*, p. 156.

‡ *Hommes Fossiles et Hommes Sauvages*, by M. de Quatrefages, p. 77.

to signify the number of warriors slain by the chiefest man buried in the chamber, and the other was marked by the figure of some animal. The skeletons were mixed up pell-mell, but evidently the bodies had been buried with care, having been reverently laid one above the other. The entrance of the vault had been closed by a great slab of limestone, which exactly fitted the opening, and had been forced out of its place by a great deposit of yellow clay which filled the cavern almost to its roof, burying all the relics. Outside the cave, beneath a mass of sand and gravel, were charcoal, cinders, and animals' bones, which were probably the remains of funeral feasts held in honour of the dead.

This most interesting cavern reveals to us several important truths concerning Primeval Man, who inhabited the rock-shelters on the banks of the Lesse in the days of the Mammoth and the reindeer. First, from the nature of the skeletons, we learn the character of the men who were buried in it. They were rather below the mean height; possessed a Mongolian or Tartar-shaped head with a somewhat brachycephalic skull, differing in this manner from the type of men who are represented by the Engis skull to which we have just referred. The brains, however, of the men buried in the cave of Frontal must have been of a fairly average size. Next we learn that the Troglodytes of the Lesse buried their dead with care and reverence, a fact which has been denied by those who are imperfectly acquainted with the customs of the men of the Palæolithic Period. Thirdly, we mark there spect which these earliest men had for the dead, for they carefully closed the opening of the sepulchral chamber with a large stone slab to keep the bodies safe from wild beasts, evidently cherishing the memories of the departed with sincere affection. Lastly, it is demonstrated that these primeval inhabitants of Belgium held the ennobling belief of Immortality.

The cave of Chaleux, in the cliffs overhanging the Lesse not far from Furfooz, is equally interesting. A mass of stones had fallen from the roof, and in the rubbish which lay upon them, which in its turn had been covered with a second fall of stones, were the relics of human occupation of the cavern. Charcoal, cinders and animals' bones, together with weapons of bone and stone, were all wonderfully abundant, no fewer than 30,000 splinters of flint alone being collected from this dwelling among the cliffs. A bone needle, with a well-formed eye, was one of these relics, and it had evidently been used for making garments of skin. This raises the question of the dress of

Primeval Man. That there were naked savages in these remote times is, of course, certain, just as there were in Northern Europe in the palmy days of the Roman Empire.* But the men who frequented the caverns of France, England and Belgium, and who fought with the lion, the elephant, and the rhinoceros, were well clothed. The numerous bone needles, with well-drilled holes, which have been found in the caves of the Dordogne in Southern France, in Kent's Hole near Torquay,† and in the caves of Cresswell Crags in Derbyshire,‡ all witness to the existence of the tailor's art in primeval days. Roughly formed flints known as "scrapers" are common in nearly all the caverns in great numbers, and were doubtless used then, as they are now, by the Eskimo,§ in cleaning the skins, which were designed for garments. Professor Boyd Dawkins even maintains, from the discovery of a carving on a bear's tooth in the Duruthy cave in the Pyrenees, that the men of the early Stone Age|| wore gloves !¶ But this is not all. In the recent discoveries carried on in the cave of Brassemouy in Western France, by MM. Piette and Laporterie, carved statuettes were found of the greatest antiquity, and which showed that the earliest men wore dresses of cloth with tippets, and drawers confined at the waist with girdles, while their heads were covered with cloth caps, after the manner of the ancient Egyptians.** It is certain, therefore, that highly cultured races existed in those far-distant times, and the idea of a universal state of primitive human barbarism must be abandoned.

A vast number of ornaments lay among the human relics in the cave of Chaleux. These were shells pierced for necklaces, small fragments of bright minerals, and miscellaneous gems for trinkets. Many of these had been brought from great distances, such as certain flints and fossil shells, which could only have been found near Paris and in Southern France. How came these foreign substances into Belgium ? M. Dupont thinks

* The reader will recollect the description which Tacitus gives of the wretched state of the Fenni. *Manners of the Germans*, c. 46.

† *The Ancient Stone Implements of Great Britain*, by Sir John Evans, 2nd Edition, p. 506.

‡ *Ibid.*, 524.

§ *Prehistoric Times*, by Lord Avebury, 6th Edition, pp. 89, 90.

|| i.e., the Palæolithic Period.

¶ *Early Man in Britain*, p. 211.

** *Bulletins de la Société d'Anthropologie de Paris*, Novembre-Décembre, 1894.

that traders were in the habit of conveying them from the banks of the Loire and the Seine to the cave-dwellers of the Belgian rivers, and he refers to the case of a tribe of South American Indians, who, according to MM. Roulin and Boussingault, traded in stones for implements with the natives who inhabit the marshy banks of the Orinoco. He is probably correct, and this proves how extensive were the commercial relations of the earliest men. In Southern France we find precisely the same thing; for the caves of the Dordogne contain numerous fragments of bright minerals, shells and amber, which were used as ornaments and must have been brought, some from the Atlantic and some from the Mediterranean coast of France, and some from regions still more distant.*

It would appear, therefore, to have been in the days of the Mammoth and rhinoceros, an elaborate system of trade amongst the earliest men in Western Europe. Trade, barter and exchange, were carried on over vast areas, and a complicated commercial system was in operation all over France, and the low countries to the north, similar to that which prevailed in North America previous to the Spanish conquest. M. Dupont maintains also, that as Western Europe was at that time covered with dense forests full of wild and savage beasts, the trade between Belgium and Southern France must have been principally carried on by means of the rivers, then much larger than now. These were navigated by the indefatigable traders of primitive times by means of rafts and canoes. All these discoveries strongly establish the high intellectual character of Primeval Man. How can we for a moment believe that the men who possessed such splendid skulls, and such large brains; who dressed in cloth and carefully-prepared skins; who adorned themselves with paint, necklaces and ornaments, and who reverently buried their dead in the belief of a life beyond the grave, were brutal and degraded savages? The idea is impossible.

Efforts have been made to identify the cave-men of France and Belgium with races now living, but the attempts have not been particularly successful. M. Dupont considers that the Troglodytes of the Lesse were of the Mongolian race and allied to the Eskimos, but that the family is extinct. Professor Boyd Dawkins goes much further, and actually identifies the cave-men with the present Eskimo,† causing them, in his

* *The Human Species*, by M. de Quatrefages, p. 326.

† *Early Man in Britain*, p. 242.

argument, to retreat at the close of the Palæolithic Period into the arctic regions of Asia and America. The reason for this identification, although plausible, seem to be somewhat precarious. They consist of the character of the bone harpoons, of the stone scrapers, and of the carvings and sculpturings, and they are certainly suggestive, so much so that M. Girod in his recent work,* accepts Professor Boyd Dawkins' theory, and the resemblance between the two races had been already suggested by MM. Christy and Lartet.† If this be true, it is another proof of the high intelligence of Primeval Man, as all who have lived amongst the Eskimo bear witness to their intellectual capacity, and to their marvellous ingenuity. Their hunting and their fishing, their snow houses and their stone huts, their boats and their sledges, their cleverly-formed darts, arrows, and harpoons, mingled with their wonderful artistic ability, all combine to place the Eskimo in the front rank among the uncultured races of living man. If Primeval Man was indeed of the same race as these denizens of the arctic regions, he must have possessed an intellectual capacity of the very highest character.

We turn now to the work of MM. Fraipont and Lohest, which describes the cave-men found in the cavern of Spy, not very far from Namur. This cave is situated on the slope of a wooded hill above the little stream of the Orneau, and has been subjected to a thoroughly scientific exploration. The animal bones found in it belonged to the Mammoth, the rhinoceros, the hyaena, the cave-bear, the lion, the horse, wolf, and the sheep. Along with the remains of these animals were found the bones of two human beings, the skeletons of which, although by no means perfect, were sufficiently complete to give an admirable presentation of the character of the individuals to whom they belonged. The skulls were in fairly good condition, and belonged evidently to the same race. Both were dolichocephalic although slightly differing from each other. The skeletons belonged to a race of men somewhat below the middle height, thick set, with a receding brow and an ape-like retreating chin. The teeth of these primitive men were well preserved, and resembled those of modern savage races of a low character. With the animal remains in the Spy cavern lay some fragments of rude pottery, which have caused M. de Mortillet to doubt

* *Les Invasions Palæolithiques dans l'Europe Occidentale*, pp. 77, 78.

† See *Reliquie Aquitanica*.

the antiquity of the human remains,* but there seems to be no reason for refusing to give to these human skeletons a high antiquity. Pottery was extensively used in the Palæolithic Period, although none has as yet been discovered in England in any deposit which is known to be of Palæolithic Age.†

These skeletons from the Spy cavern are taken as typical of the Neanderthal or Canstadt race, the men of which lived in the First Stone Age. In the Palæolithic Period there were (so anthropologists tell us) four distinct races of men, characterised principally by the different shape of their skulls. *First*: the race of Canstadt, the men of which had dolichocephalic heads, low and receding foreheads, retreating chins, and a short stature. *Secondly*: the Cro-Magnon race, also dolichocephalic, but the men of this race were tall, and had finely-formed frames. *Thirdly*: the race of La Truchère, which is known to us by only a single skull, which is of a very fine character, and brachycephalic. *Fourthly*: the Furfooz race, which occupied a somewhat intermediate position, as the men belonging to it were rather short, and had heads of a brachycephalic character, as is well shown by the character of the human remains found in the cave of Frontal.

Now, it has been argued that, of these races, the Canstadt race was the oldest, but the assertion cannot now be shown to be correct. As Fraipont and Lohest have proved, the age of the skeletons found in the Spy cavern is undoubtedly very great. But the other races, with, perhaps, the exception of that of Furfooz, go back quite as far. We have already referred to the skull of La Truchère, and we have shown what a high character it possesses, and this skull is quite as old as the skeletons of Spy. Then, again, take the case of the race of Cro-Magnon, the fine skull of Engis, with its large brain case, has an antiquity quite as great as that possessed by the Spy skeletons. These three races, therefore, evidently lived side by side in Western Europe at the same time.

But, even if we assume that the Canstadt (or Neanderthal race) was the oldest, we have still to ask if the skulls and bones of that race indicate necessarily a low mental condition. All geological research answers this question in the negative. The famous skull of Neanderthal which (with other human

* *Formation de la Nation Française*, pp. 286, 287.

† The pottery of the Palæolithic Age is well described by M. Fraipont in his paper *La Poterie en Belgique à l'Age du Mammouth*, which was published in *Revue d'Anthropologie*, 3me série, t. 11. Paris, 1887.

relics) was found in a cavern near Dusseldorf in 1857, is always taken as the principal type of the Canstadt race. What story has it to tell? It is easy to quote the words of Professor Huxley, who declared that it was the most ape-like skull he had ever seen. But there are other scientists who have expressed opinions directly contrary to this statement. M. Pruner Bey thought that the Neanderthal skull belonged to an idiot. Rudolf Wagner stated that it might have been possessed by a modern Dutchman. Von Mayer maintained that it was probably the skull of a Cossack who was killed in the Napoleonic wars in 1813 or 1814!*

We have first to consider the size of the brain which this skull—the Neanderthal—contained. Unfortunately, only the upper part of the skull was found, so that the calculations were uncertain. It has, however, been estimated that the cranial capacity of the Neanderthal skull, when perfect, must have been at least 1,220 cubic centimetres. As this is as large as many Malay skulls, and even *larger* than many of the skulls possessed by the ancient Peruvians, it is clear that the men of the Caustadt race were possessed of brains quite as large as those owned by intelligent human beings of the present day. Doubtless the form and details of the skulls of Spy and Neanderthal, and of others which are typical of the Canstadt race, are rude and brutal. But de Quatrefages shows† that the skulls of the Scottish hero, Robert Bruce, of a bishop of Toul in the fourth century, and of a celebrated Danish politician of the seventeenth century, are all remarkably like the much-abused Neanderthal skull! All these facts show that there is nothing essentially brutal in this celebrated skull. According to Professor Huxley, it is much like the skulls of the Australian natives in the province of Victoria.‡ The black Australoid race, according to the same eminent anthropologist,§ is extended from Central India to Australia, and many scientists now hold that this race was identical with the Canstadt men of primeval days.|| We know that the intelligence of the native Australians has been very much underrated, and their skill and ability are now known to be considerable. They easily learn

* *La Race Humaine de Neanderthal*, p. 95.

† *The Human Species*, pp. 309, 310.

‡ *Natural History Review*, 1864.

§ *Report of the International Congress of Prehistoric Archaeology*, 1868, pp. 94, 96.

|| *Les Invasions Paléolithiques dans l'Europe Occidentale*, par M. P. Girod, pp. 17-35.

to read and write English. They can play chess, and work the electric telegraph, while in Queensland their skill is so great that they are enlisted as police. Even in their savage state they are skilful in painting and drawing, and their manners, when kindly treated, are generally found to be good and intelligent.* If the men of the Canstadt race, whose remains were found in the Spy cavern, were allied to the Australians, they were *genuine men*, possessing all true human capacities, and capable of unlimited progress and development when placed in favourable circumstances.

Fraipont and Tihon have given to the scientific world an interesting and valuable account of the Doctor's cavern in the valley of the Rona, a tributary of the Mehaigne.† This cave they declare has been filled with detritus from the plateau above, carried into the cavern through an opening in the roof. This gives a caution to geologists not to always assume that the beds of gravel and sand found in caverns in valleys were necessarily introduced by rivers. Numerous implements of bone and stone were found in the cavern. Amongst the latter were many flint *scrapers*, which were used by the Troglodytes in preparing skins for clothing. The most striking thing, however, connected with the Doctor's cavern is that it contained *two* distinct bone-beds full of the bones of wild animals. Now, Fraipont and Tihon maintain that *all* these bones were brought in the cave by man, and that they are the remains of those animals which he killed in hunting or ensnared by stratagem. There are *several thousands* of débris of animals' remains in the Doctor's cavern, which belonged to at least 250 individual animals. In the lowest bone-bed the leading animals represented are the elephant (*i.e.*, Mammoth), the rhinoceros, the megaceros, the lion, the cave-bear, the urus, the horse, hyæna, and wolf. In the second bone-bed the largest animals whose bones were present were the lion, bear, urus, bison, and hyæna. All these animals had been killed by man, cut up outside the cave, and their heads and limbs brought within the cavern to form the feasts of the Troglodytes who fed upon them.‡

* See an article on the native Australians by the Hon. J. Mildred Creed in *The Nineteenth Century and after*, January, 1905.

† *Explorations Scientifiques des cavernes de la vallée de la Mehaigne.*

‡ The statement in this paragraph seems open to much doubt. It is hard to believe that there were the remains of 250 individual animals, and that they were all brought into the cave by men. The presence of the hyæna suggests that the cave may have been "a hyæna den."—ED.

Now, let the question be asked, How was Man able to kill these gigantic animals? All the weapons that Man at that time possessed were of flint and bone of the rudest character conceivable. At the end of their book, Fraipont and Tihon give a series of plates in which are figured the rude flint weapons used by Primeval Man in Belgium. Yet with these miserable weapons the men of those early days boldly attacked and conquered the huge beasts above enumerated. Doubtless man set snares, traps, and pitfalls for the elephant and the rhinoceros, and by doing so he showed his intelligence and resource.

All this indicates that the earliest men were as *truly human* as are the cleverest savages of to-day. The men who, with the rudest stone weapons, hunted the Mammoth, the lion, and the still more terrible sabre-toothed tiger,* were possessed of human faculties, and were truly giants in skill and courage.

The north-eastern portions of France are overspread with superficial deposits of Quaternary Age, precisely resembling those of Belgium, as is clearly set forth by Professor Gosselet, of Lille, in the work the title of which appears at the head of this article.† Gosselet has done most valuable geological work in France, and so highly has that work been appreciated in this country, that in 1882 he was awarded the Murchison gold medal by the Geological Society of London. He traces the great beds of sand, clay, and gravel, which cover so large a portion of Belgium into France, and shows that in all their main features they are similar. His first seventeen pages are introductory, and he then proceeds to describe the Quaternary beds of Northern France in detail. After a close study of the elaborate description given by the talented French geologist, the reader comes to the following conclusions. The whole of North-Eastern France is covered for thousands of square miles with enormous deposits of clay, sand, and gravel. These beds are found sometimes in the valleys, sometimes on the slopes of the hills that border them, and sometimes on the tops of the table-lands. The deposits of which we speak were all formed at the *same time*, geologically speaking, for they all contain the bones of the *same animals*, which are, the lion, hyæna, elephant, rhinoceros, and hippopotamus. How were these vast deposits of clay and gravel which cover the country formed? Gosselet declares that he cannot tell, for, according to him, only in the bottom of the valleys is fluviatile action discernible, whilst he

* *The Machairodus.*

† *Esquisse Géologique du Nord de la France.*

states that the origin of the extensive deposits which cover the uplands is unknown. The problem, however, is not altogether hopeless of solution. It is said by many able geologists* that the vast gravel beds are of fluviatile origin, and were deposited by rivers. But no rivers could have ever flowed along the tops of the hills, and over the surface of upland plateaux, and across watersheds, and in all these situations we find the same beds of gravel as are discovered in the valleys. In Northern France also there are numerous *dry valleys* where no rivers ever run or ever have run in the memory of man, and yet, in these dry valleys there are to be found exactly the same beds of gravel as may be seen in the great valleys through which rivers now flow.† The same cause which produced the gravels in the dry valleys may have formed them in the genuine river valleys. Further, we have to take into consideration the following remarkable fact. All the gravels in the valleys contain numerous bones of extinct mammals, and frequently *entire skeletons* have been discovered in these gravel beds. In the dry valleys, also, the bones of the same animals occur in the gravels. In the deposits of gravel all over France, similar phenomenon have been again presented. Now, how came the bones and skeletons of these great beasts in these gravel beds? We are told that the animals were washed into the streams and rivers, and drowned, but let us see what this statement implies, as such animals are rarely swept away by the ordinary river floods in Africa. Such a thing is rare, for these animals are too wary to be overwhelmed. Whence came the water to form these extensive floods? How could small streams suddenly swell to such an extraordinary size, that they were able to submerge these animals? The only rational solution of the problem is, that at the time when the Quaternary gravels were formed a tremendous *Flood* swept over Northern Europe, by which Man and the great mammalia then living were overwhelmed and swept away.

Here we close our notice of Primitive Man. The authors whose works we have followed are able and trustworthy. Their writings are most valuable, and to all students of the primitive condition of Man we most earnestly commend a study of the Quaternary deposits and the bone-caves of France and Belgium.

* Such as Sir Charles Lyell, Sir John Evans, and Lord Avebury.

† An extensive depression and submergence of the land took place after the "Glacial Period" in Britain and parts of Western Europe, and it is to this period the formation of the "high-level" gravels is, in all probability, to be referred.—ED.

DISCUSSION.

The SECRETARY (Professor HULL, F.R.S.), in moving a vote of thanks to the author for his important and interesting paper, said : I shall confine my remarks to the physical aspects of the subject. The period in the world's history to which the paper referred was perhaps the most critical and far-reaching of the great periods in geological history, as to it is referred the first appearance of Man. It did not follow that because Man, as represented by his works and remains, first appeared in the Pleistocene gravel beds and caves of Belgium, that he had not been long before an inhabitant of some other part of the world, probably in the Euphrates Valley or that of the Nile ; but his appearance in Belgium and Western Europe was strictly defined as subsequent to the close of the Glacial Epoch. The earliest of the deposits described by Mr. Whitley was probably "the Loess" or glacial mud, formed by the melting of the vast deposits of snow and ice of the Glacial Period from off the Alps. These deposits, which partially line the Rhine Valley, contain no human remains, though bones of *hippopotamus* occur. The climate, which had been Arctic in character during the Glacial Period, was now becoming warmer owing to the gradual lowering of the land from its preceding high elevation ; in fact, "the Pluvial Period" had set in, and rivers took the place of glacier ice ; and as the land, in the succeeding epoch, gradually rose by successive stages, the deposits of river gravel were formed on the flanks of the valleys. It was now that Man seems to have appeared, and with him the animals of the Quaternary Period, so graphically described by the author.

The caves in the Carboniferous and Devonian limestones of Belgium were in all probability formed by subterranean rivers during (in part) the Pluvial Period. As the land rose, they became dry, the waters having either dried up, or found other channels, and thus became the abode of primeval men, or of the cave lion and hyæna. The Pluvial Period was of long duration, and is largely accountable for the flooding of the plains and low-lands of Western Europe. The geological phenomena of Belgium are represented in England, except that we have no representation of the Loess ; but I

cannot agree with the author in supposing that at the Quaternary Period "a tremendous flood swept over Northern Europe, by which Man and the great mammalia then living were overwhelmed and swept away." The drowning of wild animals in rivers or lakes is quite an ordinary event in nature.

Rev. A. IRVING, B.A., D.Sc.—I am sure we all thank the Rev. D. Gath Whitley for the able and comprehensive manner in which he has presented a summary of recent researches on Primeval Man in Belgium during the last quarter of the nineteenth century. The most valuable parts of the paper are, to my mind, those descriptive of the bone-caves and the cave-men, with comparisons drawn between some of the cave-men and the modern Eskimo, and between others and the Australian aborigines. In the former case it seems likely that human beings of such a type may have existed in Belgium and Northern France at the time even of the extreme glaciation of Northern Europe, when the southern limit of the great inland ice-spread appears to have been along a line roughly drawn through the mouth of the Thames, the mouth of the Rhine and Westphalia. A difficulty presents itself in the appearance of remains of great beasts of warmer regions along with those of the reindeer and other animals of high northern latitudes. It would almost appear that such an intermingling of a northern and southern fauna might be accounted for by the former animals being driven southwards by the advancing ice of the earlier Quaternary Period and mingled with such of those, now confined to warmer latitudes, as were able to adapt themselves to new conditions and so survived the increased severity of the climate. The thick hairy covering of the Siberian mammoth is a case in point.

In his able paper, Mr. Whitley has compared the results obtained by the Belgian explorers with those obtained by others in the South of France and in England. He would have added to the interest and value of his paper, had he extended that comparison a little to those obtained by German explorers, such as the Lindental Caverns near Gera, the Hohlefels of Achtal in Swabia (explored by O. Fraas), the Räubershöhle near Regensburg (explored by Zittel and von Dechen), not to mention others.

It may be of some interest to the members of the Institute to compare the results presented by Mr. Whitley with the following extract from the latest edition (1906) of Credner's *Elemente der*

Geologie :—“The great abundance of the articles of workmanship of Quaternary man and the remains of his hunting spoils which have survived to us, give a pretty clear picture of his civilisation and habits of life. The men were nomads and cave-dwellers of the lowest thinkable stage of culture; the use of metals was unknown to them, and for a long time even that of pottery ; their tools and weapons were originally only rough-hewn flints and coarsely-worked bones. Towards the end of the Quaternary Period a certain sense of beauty and of art in the production of carefully designed weapons and implements, of carvings and drawings on stone, ivory and antlers began to develop itself among them. Instead of cooking-vessels made of clay, the earliest men made use of slates and sand-stone slabs ; agriculture was unknown to them, they lived by hunting, which they must have carried on very often in frightful conflict with the most powerful and gigantic representatives of the animal world with weapons of the most miserable description.

“The duration of the Palæolithic Period must have been of very great length, since at the commencement of the Neolithic Period, with the animal and vegetable world standing so nearly related to the present, the climatic conditions, and with them the inhabitants of the continent, have been transformed, and have become pretty much those of to-day.”

All this seems to suggest that the more civilised cave-men of Belgium lived for the most part towards the end of the Quaternary Period. This point would receive some elucidation if Mr. Whitley could correlate the various articles of human workmanship with the successive layers of the cave-deposits, the existence of which he has noted in the case of the Goyet Cave.

We may find an explanation of the “Flood Period” by referring it to the later stages of the Ice-Age (the “jungdiluviale Steinzeit” of the German investigators, the “Magdalénien” of the French), with the melting of vast regions of land-ice, and of the widespread snow-fields, which must have accompanied it outside the limits of the ice itself. Further, if (as is probable) Britain was joined to the continent of Europe, while the North Sea was blocked by the confluent glaciers from Scandinavia and from Scotland (as the late Professor Carvill-Lewis has shown on his maps and in his writings), the waters of the land and ice-blocked German Ocean stood probably high enough to cover the low plateaux referred to in Mr. Whitley’s

paper. This suggests an explanation of the widespread distribution of similar detritus over both the plateaux and the shallow intervening valleys; and M. Gosselet's problem (pp. 40, 41) would seem to be solved. The gravels which cap the higher hills (Mr. Whitley does not tell us that they contain Quaternary organic remains) may be much older; and their relation to the present valleys and lower uplands may, by parity of reasoning, be accounted for in the same way as some of us have explained the occurrence of the high-level gravels of Tertiary age, both on the north and the south borders of the Tamisian area.

Rev. J. MAGENS MELLO, M.A., F.G.S.—I have read Mr. Whitley's paper with much interest. It is one which must give rise to many questions on doubtful points. Although dealing with the Belgian area, we must necessarily connect with this both the French and our own amongst others. I only venture now to allude to one or two points.

First, as to "the attempt to prove the great age of the human race by assuming the slow formation of the Quaternary deposits," I scarcely think this is what is usually relied upon, and whatever may be said in support of the theory of the extensive flood, pouring its waters over Northern Europe, and drowning the great mammalia and Man, and depositing over this area the great beds of gravel and clay, etc., which now overspread so much of the country, who can venture to say how long before this catastrophe Man made his appearance in these regions? neither have we any clue as to when such a flood occurred. It is quite possible that the late Sir Joseph Prestwich and others were right in attributing the close of the Pleistocene Age in Europe to a great depression and a consequent flood, after which we find a great change in the fauna; the disappearance by extinction or migration of old forms, and the incoming of new species, and also of a new race of men; but have we not clear proof also that between the Pleistocene Age and our own, changes were brought about in the physiography of these regions, so great, that they must have required the agency, not of passing flood, but of powerful denuding forces acting during a lengthy period?

We have to take into account not only the depression of the land some hundreds of feet, by which the British islands were severed from the Continent; but we have also to take into con-

sideration the cutting of deep valleys, and the scooping out of others, which, though previously existing, had been filled up with drift material. We have evidence in the implement-bearing drifts, that the rivers flowed during the human period at levels far above those of the present water-courses. We may note also such a great change as that shown by the disappearance of the old Solent river, and the severance of the Isle of Wight from the mainland.

Then again as to "the vast expanse of water" with which it is assumed Western Europe was surrounded, we must note that in the South the Mediterranean area was far less than it is now. During the Pleistocene Age the general level of the land was higher than it is now; and instead of occupying its present extensive basin, the Mediterranean Sea was then in all probability divided into two separate lakes; for not only did a land barrier connect Northern Africa with the Iberian peninsula; but to the East such islands as Malta and Sicily formed part of the mainland, and appear to have been another connecting link between Europe and the African continent. There is also evidence that the Nile country, at any rate, of Egypt has not been submerged since it was occupied by Palæolithic Man, as is proved by the recent remarkable discoveries made by Mr. Rt. de Rustafjaell of undisturbed Palæolithic flint factories in the Western Desert, near Gebelén, Thebes, El-Mallah and Nagâda.

As to the supposed climate of the Pleistocene Age, I am much disposed to doubt that its general character was one of "mild summers, and warm winters." Not to speak of the mammoth and woolly rhinoceros, which some may think do not necessarily bespeak arctic conditions, are not such conditions demanded by the presence of such undoubted arctic species as the musk-ox, the arctic fox, the glutton, the reindeer and others? Surely it is far more probable that during at any rate a great part of the age the climate was one characterised by severe winters, and hot summers; the former driving the northern fauna, even the musk-ox itself, as far south as the Pyrenees, whilst the hot summers would have enabled the African species to find their way along the river courses of Northern Europe, so that we find such a southern type as the hippopotamus as far to the north as Derbyshire and Yorkshire. It is owing to such a constant movement to and fro with the changing seasons, that the commingling of the respective groups of

animals, which is found in our cave and other Pleistocene deposits, is most easily accounted for; and this commingling we must note is that of animals which once lived together on the spot, not one brought about by a flood sweeping together the bones of animals which had no mutual connection.

At the same time we may allow that the great depression of the northern area at the close of the Pleistocene Age which brought about, amongst other results, the separation of our islands from the continent, may have been accompanied by a more or less sudden submergence of part of the area, and the evidences of this which were so ably set before us by Sir Joseph Prestwich cannot be lightly passed over.

Professor ORCHARD, M.A., B.Sc.—I have much pleasure in supporting—we all support—the vote of thanks which has been moved and seconded to the learned author of this valuable paper. It is a paper which supplies several illustrations of the great principle that there are no collisions between truth, that the facts of science—though not necessarily the speculations of scientists—are always in harmony with the statements of God's Word, the Bible. I have been struck, in reading the paper, with the carefulness of the investigation and with the general ability of the reasoning.

Some years ago we were told, by people who ought to have known better,* that our primitive ancestors were ignorant savages, themselves the offspring of certain ape-like forms whose habitual and congenial occupation was to crack nuts and run up a tree. He would be a bold man who, in view of the discoveries brought before us, ventured to maintain that theory now. We shall agree with the author that we cannot “for a moment believe that the men who possessed such splendid skulls and such large brains; who dressed in cloth and carefully-prepared skins; who adorned themselves with paint, necklaces and ornaments, and who reverently buried their dead in the belief of a life beyond the grave, were brutal and degraded savages. The idea is impossible.” The supposed savage or barbarian turns out to be an ancestor of high respectability. He is not a warrior only, but also a huntsman, and a sailor. He is an artisan, a fisherman, and a trader. He concerns himself with

* It would seem as though, in this case, the sense of self-importance had curiously inverted the sense of filial respect.

pottery, tailoring, jewellery ; and knows something of that great future which lies on the other side of death.

We shall, I think, be of opinion that, in view of the mistakes made by a scientist so eminent, and justly eminent, as Sir Charles Lyell, it becomes scientists to be modest. Science is necessarily progressive. Scientific facts are permanent ; but scientific theories have no finality, they are provisional only ; they are always open to revision and modification. In this they differ from the statements of Holy Writ, which are unchangeably and eternally true.

M. L. ROUSE, Esq., B.L.—The fascinating paper that we have just listened to shows in the first place that the relics of Palæolithic Man in Belgium are found in a pebbly bed under a wide-spreading clay ; and the fact that this clay throughout Belgium and North-Eastern France covers hill and dale like a skin.* Akin to these discoveries in the relative position of the relics is the one made five years ago at Ipswich, and worked at by Miss Nina Layard and her friends, as told by her at the British Association's meeting in Cambridge in 1904. The Palæolithic tools were covered with the clay of the Suffolk plateau to an average depth of ten feet ; and, as Sir John Evans certified, they all lay upon the bed of an ancient lake. Thirty inches below them in coarse gravel were found bones of rhinoceros and other animals ; and twelve feet lower still was the glacial boulder clay ; and, in the discussion that followed Miss Layard's account, Professor Boyd Dawkins stated that every deposit of Palæolithic remains which he had seen in Britain lay above the glacial formations.

Mr. Gath Whitley has to-day presented us with facts that will be interesting to many. Some of us already knew that the Palæolithic (or antediluvian) folk were artists who could scratch upon bones good pictures of animals, indeed the late Sir William Dawson, in his “meeting-place of geology and history,” had told us of a necklace made by them, composed of large teeth upon each of which was the figure of a different animal. And then—what do their statuettes themselves reveal, but that they were a well-clad people.

* I entertain much doubt regarding this wide-spread pebbly clay in Belgium. Having visited more than once the Liége district I do not recollect having noticed this wonderful deposit.—ED.

In his Romanes Lecture delivered at Oxford last June, Professor Ray Lankester in "referring to the Emergence of Man, through material selection, stated that the Palæolithic implements, though not improbably made 150,000 years ago, do not, any more than do the imperfect skulls occasionally found in association with them, indicate a condition more monkey-like than is presented by existing savage races," *Daily Mail*, 17th June, 1907. The admission is most striking; but the chronology is absurd.

In the year 1863, Professor Faa de Bruns of Turin made a calculation that if the population of the globe had only increased at the rate that the population of France was then increasing—namely by $\frac{1}{227}$ per annum, from the time when a single family started from the ark (which he puts at 2344 B.C.), it would then have amounted to 1,300 millions, the figure at which it was set in his time. (Quoted and confirmed by S. Moigno in his review, *Les Mondes*, for 1863 pp. 516, 517.)

Professor J. L. LOBLEY.—The *Pithecanthropus erectus*, which has been mentioned in the discussion, was discovered in 1894, in Borneo, by M. Dubois, and is famous as being the oldest of the Primates yet known with the vertical axis of Man, and so has been called the "missing link." Implementiferous gravels are by no means confined to the bottoms of river valleys, since they often form terraces along the sides of such valleys, sometimes at considerable elevations above the present rivers which are thus shown to have cut down these valleys deeper since Man had first occupied them.

Dr. W. Woods SMYTH.—I have much pleasure in seconding the vote of thanks to the author of this interesting paper, and to compliment him on the great amount of information which he has compressed into a small compass.

I beg, however, to differ from the writer in regard to his estimates regarding the man of Spy and the Neanderthal man. Professor Huxley's words ought to be quoted, and are as follows:—"They were powerfully built, with strong, curiously curved thigh bones, the lower ends of which are so fashioned that they must have walked with a bend at the knee. The difference is abysmal between these rude and brutal savages and the comely, fair, tall and long-headed [*i.e.*, high foreheaded] races of historic times." The latter point in regard to the thigh bones is of the greatest significance. We may mention a fact here which has an important bearing upon these

Primeval men. Sir Wm. Dawson has pointed out that the mammals of the Tertiary exhibit a shortening of the brain as well as increase of size in the later Tertiary and Quaternary Ages. Now, this is exactly what has taken place in the brain-box of men. Here is a photograph of the skulls of the man of Spy and the Neanderthal skull, with the skull of the *Pithecanthropus erectus* below, and a skull of the modern European above. The shortening of the dolichocephalic shape in the modern skull is manifest, a feature shared by the man of Truchère. This is convincing evidence of the man of Truchère being of a later date. These races could only have been synchronous in the sense of their overlapping each other at either end of their racial histories, as is seen in all decaying and rising races of organisms. Observe, in round numbers, the capacity of the skull of the modern man is 1,500 c.c., the skulls of Spy and Neanderthal 1,200 c.c., while the *Pithecanthropus erectus* is 1,000 c.c., and the highest ape reaches 500 c.c., the monkey 250 c.c. Surely we have here evidence of progressive evolution.

The points relating to the interest which the Victoria Institute has in view are important, and have formed the subject of a communication of mine to this Institute. The men, male and female, of Genesis 1, were evidently a pre-Adamite race, from which no doubt Adam was derived. By no torturing of Scripture can you make the "female" of the first chapter the Eve of the second. Because the female of the first chapter is on the open field of Nature, where Eve was not until after the fall, which event cannot be placed in the sixth day, which concluded with all things being very good. Again, the immense skull capacity of these early men, compared with that of the modern man, is an evidence of some deteriorating element having entered the human race at an early date, and points distinctly to the fall.

I am glad that Mr. Gath Whitley adduces evidence of the Noachian Flood, in which he has the support of the late Sir Joseph Prestwich.

Colonel HENDLEY, who had taken the second chair, then put the vote of thanks, which was carried unanimously, and the meeting separated.