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ORDINARY MEETING.*

H. CADMAN JONES, Esq., M.A., in the Chair.

The Minutes of the last Meeting were read and confirmed, and several Elections took place.

The following Paper was read by the Author :—

ON CUTS ON BONE AS EVIDENCE OF MAN'S EXISTENCE IN REMOTE AGES. By Professor T. MCKENNY HUGHES, M.A.

IN the *Reliquiæ Aquitanicæ* Professor Rupert Jones has given an interesting account of implements of wood, bone, and ivory, bearing marks indicative of ownership, tallying, and gambling. There can be no doubt that all these are of human workmanship. Some of them are recent; some are found associated with abundant traces of primæval man; and some occur on harpoons, and on other bones worked into useful forms.

Cuts and scratches have been made on bone in many different ways and for many different reasons. Sometimes, as shown by Dupont, a hunter who had been successful, and brought down some big game, which he was unable to carry away, cut off a few good steaks, and, if not the hide, at any rate the tail, the long hair of which he required for many purposes. But the flesh was not so easily removed, and, where the large muscular portions clung closest, he had to draw his knife frequently across to detach it, and thus made grooves and scratches on the bone. So also, as pointed out by Professor Rupert Jones, the foot bones of deer and horse and the bones

* May 6, 1889.

*** The bone alluded to in this Paper was laid before the Meeting, and the accompanying illustration is a reproduction, by the Collotype process, of a photograph thereof. The work was executed by the Cambridge Philosophical Instrument Company, and has been justly admired.—*Ed.*

of birds have been scored by man when cutting off the sinews to get thread for sewing. Besides these, however, some solitary specimens of bone, or wood, or stone, dressed, and cut, and scored, have been found in deposits in which there is no other trace of man, and where these specimens themselves are the only evidence adduced of man's existence at the time. It becomes a question of much importance, therefore, to ascertain the various ways in which such markings are produced. I have already commented* upon the manner in which sticks get worn down in water, so that they appear as if cut across the grain to a tapering point; I have shown how teeth, and bones, and shells get perforated so as to resemble those strung by savages as beads.† Jukes explained the indentations on some bones of an Irish elk, found under peat near Legan, in Ireland, by pointing out that pieces of the antler lay against the bone or bone against bone, exactly fitting, so that the indentations on the one corresponded to projections on the other.‡ I now propose to criticise the evidence to be derived from scorings at regular intervals, and cross-cuts, and such-like markings.

It is difficult, when examples of this kind are brought forward, and are represented as the work of man, to prove the negative, however convinced you may be of the improbability or even impossibility of man's having been where they are found. It is not always possible to bring forward at once satisfactory evidence that they were not made by man, whose work they often exactly resemble; or, to answer the question, if they were not made by man, what then can have produced them? It is useful, therefore, when one happens to meet with such a bit of evidence, to place it on record, so as to have it ready for reference when the particular point on which it bears is under discussion. I now exhibit two saurian bones distinctly scored at regular intervals by cuts, such as might be produced by a flint knife. For comparison I show also a pointed bone which I brought from the palæolithic cave of Gourdan in the Pyrenees, near Montrejean, which is scored by very similar markings. I would refer, in illustration to figs. 75§, 76, 77§, p. 194 of the *Reliquiæ Aquitanicæ*, and to pl. B. xiii., f. 13.

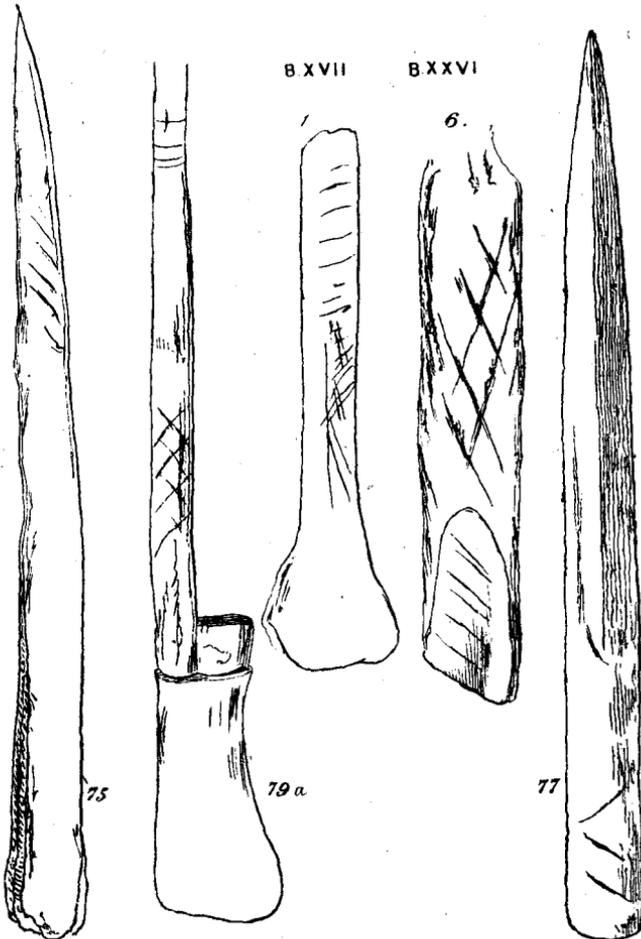
* *Vict. Inst.*, vol. xiii., 1879, p. 316.

† *Journ. Anthropol. Inst.*, April 8, 1872, p. 93. *Geol. Mag.*, vol. ix., 1872, p. 247.

‡ *R. Geol. Soc. Ireland*, Dec. 9, 1863; see also *Geol. Mag.*, vol. ii. 1865, p. 28; Carter, *R. Geol. Soc. Ireland*, March 8, 1865; *Geol. Mag.* vol. ii., 1865, p. 216.

§ Reproduced in outline, *vid. inf.*, p. 211.

The larger saurian bone now exhibited (*see PLATE*) is, moreover, marked along one side by crosses at regular intervals. Similar crosses are seen on the bone from Gourdan for comparison with which I refer also to the *Reliquiæ Aquitanicæ*,



The numbers refer to plates and figs. in the *Reliquiæ Aquitanicæ*, from which these figs. are, by permission, reproduced.

pl. B. xvii., f. 1, and pl. B. xxvi., f. 6. I would call attention also to figs. 74 and 79a; pl. ix., figs. 2 and 5; pl. B. xxv., figs. 1, 2, 5, and 6. There is sufficient ground for admitting the human origin of all these cut bones figured in the *Reliquiæ Aquitanicæ* from the cumulative evidence of their

surroundings. Some are recent and were obtained from native tribes who still make them.

But I would submit that if these saurian bones now exhibited had been found in a cave with harpoons and various carved and manufactured objects, there would be no question as to their being of human workmanship. These bones would be thrown in with the rest as scored and cut by man, though for what purpose we might not be able to tell.

But I procured this bone 17 feet down in the *Kimmeridge Clay*, near Ely.

The first suspicion is, of course, that there must be some mistake; that it was a bone from the *Kimmeridge Clay* lying on the surface, which had got scored by man or striated by ice action, and that it had fallen from the top as the workmen were excavating,—a very common source of error. Although there is boulder clay about, we may dismiss the suggestion of ice action, as the marks have not the character of glacial scratches; but they certainly do resemble the work of man.

We are, however, able to prove that they are due neither to glacial nor human agency, and that there is no mistake as to the derivation of the specimen, but that the cut bone really did lie in the *Kimmeridge Clay*; for here and there on the scored surface there are shells of a small oyster (*Eoogyra nana*), and a Polyzoon [*Berenicea* (*Diastopora*)], of Jurassic age, which attached themselves to solid bodies on the sea bottom, and grew on them, taking their form. So these fossils have the impress of the cuts upon them, which were in this manner stereotyped, as it were, in the Jurassic sea, and still survive to teach us caution.

The other saurian limb bone which I exhibit is from the same series at Ely. It is similarly cut and grooved; while overlapping the striæ there extends a calcareous incrustation not uncommonly found on bones in place in the *Kimmeridge Clay*. This also must have received the markings in the Jurassic sea.

Now for a few words of speculation. What can have made the marks? In talking the matter over, Baron von Hugel told me he once saw sharks playing with large bones thrown out to them, not bolting them at once, but now one and now another catching them. He could not tell what the bones looked like when they had done with them, but we may infer that a fresh bone would certainly yield to the bite of the conical-toothed fish and saurians of the *Kimmeridge* age, even though we may not credit them with the cutting power of the hyæna jaw, the toughness of the otter's tooth, that

will mark an iron trap, or even the keen edge of a rodent's incisor, which will deeply score any bone that lies across its burrow. The bones in the badger earth at Barnwell were cut and scratched.* So we have fish and reptiles suggested as the agents which might have produced such marks.

In the Woodwardian Museum I find a Kimmeridge Clay fish, the intervals between whose pointed teeth exactly agree with the intervals between the cuts on the saurian bone. There are many saurian jaws also of which the same might be said. Perhaps, therefore, even before the paddle was detached, and while there was still some flesh on it, shoals of hungry fish and reptiles kept biting, and tearing, and leaving teeth-marks when the bone was reached. But this is guess work. What is certain is that the cuts are not the work of man.

The CHAIRMAN.—I presume I need hardly put it to the meeting that we should return our thanks to Professor Hughes for his very interesting paper, which it has been a great pleasure to listen to. It is now open to those present who have studied the subject to commence the discussion.

Mr. PARK HARRISON, M.A.—I need scarcely ask whether Professor Hughes, who is so completely up in his subject, can answer me this question: I remember that not very long ago there was a disputed point, in the Eastern Counties, I think, of this kind. Those present will remember what I am referring to. There had been some boulder clay, supposed to be *in situ*, and the Professor detected that this boulder clay had been washed down, or had been brought from rather higher ground. It had covered certain works, supposed to be the work of man, and I think that was accepted. I was merely going to ask him this question, and, as I say, I must almost apologise for worrying him; but I think the meeting will like to hear anything that can be disposed of as a possible objection. Is there any higher ground beyond this Kimmeridge Clay from which it might be dissolved and washed down, and then appear quite as if it had never been washed down?

Admiral J. H. SELWYN, R.N.—In my naval experience I have known sharks capable of biting bones in two, the thigh bones of man yielding to them like so many tobacco-pipes, and I can well believe

* See *Geol. Mag.*, Dec. 2, vol. x., p. 454.

that saurians would score bones in the manner the Professor has described. I think the evidence of the marks is very good indeed, and I should be more disposed to attribute them to that cause, which is constantly acting even in the present day among the larger crocodiles, sharks, &c., than to any other. As to Professor Hughes' reference in the title of his paper to the antiquity of man, perhaps he does not intend to imply that all these evidences, even if proved to correspond with the existence of man, would be any real evidence as to his antiquity. We have heard much of the remains of man in the gravel deposits, but such deposits may be brought about in short time. We all know what water is when once set in motion by upheaval from the bottom of the sea, such as at Krakatoa, producing gigantic effects even to the moving of rocks 200 tons in weight. Of the suddenness of some of its effects we have evidence also in the sandstone, where fish have been suddenly overwhelmed without any disruption, every scale being perfect; and they may be now examined in the sandstone-rock in the order in which they swam. Darwin has alluded to evidences of the sudden upheaval of the Andes in America, and this may have brought about a sudden catastrophe such as may have produced that flood of which we find traditions in various parts of the world.

Professor T. RUPERT JONES, F.R.S.—I ought to make no remarks at all or else a great many. At all events, I will thank Professor Hughes for bringing forward this instance of the necessity for caution. It is a very good pleading that one should be very careful indeed in coming to conclusions. But I hope I do not understand the last speaker as having any particular objection to hearing anything about the antiquity of man (hear). It seems to me it is a question we should investigate, and avoid treating in any sentimental manner, as some do. Our friend, Professor Hughes, I think does not take the view that the antiquity of man should be put down or reduced to a minimum. We do not wish to make it of incalculable extent; but so far as the evidence will take us let us go. With what our friend has noticed I really have nothing to find fault with, excepting perhaps that he has not made his own case quite so strong as, if he had had time, he could have made it. He could have brought forward other matters; for instance, that very curious set of bones in the peat of Ireland which are scored, and apparently cut, and chiselled, and notched; and yet this was the effect of the sharp edge of a limb bone, lying across another bone or an antler of the gigantic deer in Ireland. From the tremor of the

peat bog a slight movement had been continuous, so that one bone rubbing upon another had produced incised marks, which were very similar to those which could have been produced by an instrument. Then he might have added examples of the effect of fish upon bones. I never heard before what our esteemed friend Admiral Selwyn said just now,—that a shark can bite a thigh in two. It had escaped my observation; I do not mean personal observation, but I have read that the flesh would be stripped off the thigh-bone by the bite of a shark, and necessarily some scoring would be left on the bone even in that simple operation,—simple so far as the shark is concerned. Then, again, there are accounts of sailors being pulled to pieces by sharks within sight of their vessels, and in such cases certainly some of the bones, perhaps many of them, must have suffered these scratchings and markings. The markings found on the saurian bones are very curious indeed. They look artificial in one or two instances, seeming as if little crosses had been made. At first sight a cross seems a very artificial mark, but if a great saurian or other animal held such a bone in his teeth and then just slipped it round, or another pulled it from him, there might be such a change in the position of the bone that the next scratch upon the bone might cross the older scratch at an angle, and the two scratches might then appear like a cross. There are a great many crosses upon antique pottery, made as symbols of sun-worship no doubt. Long before the Latin cross was used the Greek cross was used by our predecessors in connexion with their religious faith and the worship of the sun. The crosses on that bone are very noticeable. Of course, the history of the Kimmeridge Clay is in good hands when dealt with by our learned Professor. He can tell you a great deal more about it than I can; and he can tell you, no doubt, that there is no probability of the bone having been found in anything else but the solid unmoved mass of the clay. I think he was rather hard upon one point in the *Reliquiæ Aquitanicæ*, if I understood him rightly. He said that one of the illustrations in the book showing some shells strung together as ornaments, the holes had been naturally made on the sea-shore by wear and tear. I do not see how those shells could have naturally received the holes (which were necessary for allowing the thread, sinew thread, of course, in those days, to be passed through them) in that nice, symmetrical manner which is necessary for making a necklace, except they were made by man; and, as people in those days did really use flint tools for making holes in bone and antlers and

teeth, there is no reason why they should not have made holes in the shells. That is all, I believe I may say, in finding any fault with our friend's very learned and able discourse, although so very short and concise that I really wish he had enlarged upon it (hear, hear). I should have liked to have seen some of the pointed sticks he mentioned. I had not the opportunity of hearing the paper in which he dealt with the wearing down and tapering of sticks; but I dare say he will give us the reference to the paper where we may see the description and perhaps the illustrations of these. There is a very curious incident (if I am not detaining you too long) with regard to such sticks.* There was a group of sticks found at Dürnten, in Switzerland, thought to be the remains of a basket. These bundles of fir sticks looked very much like interlaced twigs, made and arranged for the purpose of carrying things; but it was clearly pointed out that the interlacement was accidental, the twigs having fallen one over another, and what seemed to be artificial marks where they cross were really the little nodes on the fir sticks. You know little twigs of fir have very symmetrical buds and nodes. I think that adds to our friend's argument that you must be very cautious indeed in receiving evidence. Mr. Skertchley's old flint implement under boulder clay we can also leave in Professor 'Hughes' hands; as I dare say we might a great deal else. With regard to the geological facts referred to by the Admiral, some of them have been very well handled by others. I think Dr. Buckland years ago took up some arguments explaining the effects of local deluges; and I would recommend those people who are interested in knowing about the matter to read that interesting chapter in Mr. Belt's book *A Naturalist in Nicaragua*. I do not say it must all be taken as the permanent result of investigations, but it is very suggestive and no doubt very true so far as his knowledge went. He died before he could fully carry out his researches, but in that chapter there is much that is interesting, and a foundation is there laid for further observation on the effects of deluges not only in Central America and the north part of South America, but all over the world.

* See paper on "The Present State of the Evidence bearing upon the Question of the Antiquity of Man," by Professor T. McK. Hughes, M.A., *Transactions of the Victoria Institute*, vol. xiii., p. 321.—ED.

Mr. ARTHUR SMITH WOODWARD, F.G.S.—I think, sir, I should not like to say much in regard to this subject except to call attention to the collection of Mr. Leeds near Peterborough. Mr. Leeds has made an enormous collection of bones from the Oxford Clay near Peterborough, bones of the same character as these, and it is really remarkable, on looking over that collection, to find so great a number of records of accidents that happened when these creatures were fighting one with another. He has several of those bones which have been broken and mended again, and many others which show teeth-marks. In one particular instance he has a crocodile femur with a hole pierced right through it where the teeth of one of these large saurians must have bitten the bone and left its impression. That hole is quite obviously made by these teeth. It is scratched all round, and has nothing like the polish and finish and symmetry of the holes which are artificially made by man.

The AUTHOR.—A question which is very much to the point was raised by Mr. Park Harrison when he said, Can that bone have come out of a pocket or out of any derived deposit whatever? That is the kind of thing I have always been looking out for, and that is the kind of question I anticipated being asked, because I have so often asked other men, when they have produced flint implements from what I considered to be improbable places, whether they might not have been procured from washed down material; and in many cases I have proved this to have been the case. It is only after looking carefully into the question that I am going to reply. If I have any means of judging of undisturbed rock from the manner of the occurrence of fossils in sequence, and from the manner of occurrence of the clay between the layers of septarian nodules, it was certainly undisturbed Kimmeridge Clay from which the scored bone was procured. I have no hesitation whatever in saying that. It is not one of those doubtful points, upon which I think you will allow I am generally sufficiently cautious in making statements. So also, in reply to the remarks of Admiral Selwyn with regard to the material heaped up by cataclysms such as the earthquake waves of Lisbon or Krakatoa, I would point out that there are a great many tests to be applied to beds of gravel, by which you know how they are formed. If you find gravel with beds of clay and loam and young shells in this bed and old shells in that bed, with fresh-water plants here and bones there you cannot refer that to anything like an earthquake wave. The

tumultuous deposit formed by waves of that sort is totally different from the kind of deposits we have to deal with in most of these cases. We are obliged to say of a great many there is a doubt about it; it is not clear. But in many it is perfectly clear. You know the physical geography of the country for successive ages, as you have traced the history back. You see there, perfectly coinciding with all the evidence you get from other sources, deposits forming layers of different material, showing different transporting power; water of one velocity carrying the coarse stuff; water of another velocity carrying the fine stuff; floating bodies collected in the eddies, and so on, and the whole story can be read if you get a sufficient number of sections in the gravel beds. We are not speaking of gravel beds in the case before us, but a question has been raised as to the value of the kind of evidence we are dealing with when we approach this question from the geological point of view. No cautious man would make any very strong statements founded on evidence derived from gravel about which he could not tell you more than that it was gravel and carried at some time, he could not tell you when, or carried by some waves, he could not tell you how produced. Generally speaking, you can get better evidence than that.

I was very glad to hear the Admiral's confirmation of the biting power of sharks, but if somebody could give us direct evidence in the shape of a bone which he saw a shark bite, that is what we want. That is what I asked Baron Von Hugel to give me. He said he thought he had somewhere a bone fish-hook which had been scored by a large species of ray caught in some of the Pacific Islands, and the natives told him the scorings were due to the teeth of the fish they caught; but I could not get one to bring here, and as we are all extremely sceptical people we should like just to have one which somebody saw in the mouth of the shark. It is an interesting fact that the distances between the points of the teeth in some of the jaws of fish and of saurians from the Kimmeridge Clay of the Ely district, are exactly the same as the intervals between the furrows on the scored saurian bone. We may get over the difficulty as to the markings being seen on one side only, by the suggestion of the probability that the flesh was not removed down to the bone on both sides, and it was only when the teeth touched the bone that the cuts would be made. I am very glad to have been instrumental in bringing Mr. Smith Woodward here. Mr. Smith Woodward is one of the best authorities in England on fish

and might have told us a great deal more as to the power of these different fish, and the sort of fish they were. However, he also has quite confirmed the fact that fish could do this kind of work, and has told us that a great many bones are found in other formations scored in the way described. The one important point in which my bone is better than all those other bones is that on it we see a little oyster and polyzoon which grew on the place which was scored, thus proving the contemporaneity of the cuts with the deposit in which the bone was found. If I had gone on to the general subject, I should have brought in the cut and sawn bones described by Capellini and Prestwich, but I am very fond, when I have a good strong point, of sticking to it. I know I have here a thing on which no one can upset me. Therefore I did not bring in other things about which there might have been a great many questions raised. That is the excuse I give for not having enlarged the scope of my argument.

But the general question of the antiquity of man* is, of course, raised by this subject, and I will endeavour to answer the questions that have been put to me, even when they do not bear directly upon the matter before us, which does not itself admit of much discussion.

* Professor M'Kenny Hughes has more than once done valuable service by carefully examining the geological evidence upon which arguments in favour of the extreme antiquity of man have been founded, and has shown that that evidence "has completely broken down in all cases where it has been attempted to assign him to a period more remote than the post-glacial river gravels." Speaking on the advent of man, Sir W. Dawson, K.C.M.G., F.R.S., says:—"How man came to be, is, independently of Divine revelation, an impenetrable mystery—one which it is doubtful if in all its bearings science will ever be competent to solve. Yet there are legitimate scientific questions of great interest relating to the time and manner of his appearance, and to the condition of his earlier existence and subsequent history, which belong to geology. . . . While we have no certain data for assigning a definite number of years to the residence of man on the earth, we have no geological evidence for the rash assertion often made that in comparison with historical periods the date of the earliest races of men recedes into a dim, mysterious, and measureless antiquity. On the basis of that Lyellian principle of the application of modern causes to explain past changes, which is the stable foundation of modern geology, we fail to erect any such edifice as the indefinite antiquity of man, or to extend this comparatively insignificant interval to an equality with the long æons of the preceding Tertiary. The demand for such indefinite extension of the history of man rests not on geological facts, but on the necessities of hypotheses which, whatever their foundation, have no basis in the discoveries of that science, and are not required to account for the sequence which it discloses."—ED.

With regard to the shells which my friend has taken me to task about, I have already stated that I have not the slightest doubt that all these things he has described in the *Reliquiæ Aquitanicæ** are the work of man. The plates he has been so good as to lend me are here somewhere; they were handed round. In the remarks to which he refers, I was speaking, not of his figures, but of the teeth of sharks and other fossils perforated by lithodomous molluscs. But another kind of evidence comes in in these cases. In some very old deposits, such as the gravels of St. Acheul and Amiens, there are a number of fossil sponges, *Coccinopora globularis*, washed out of the chalk. These are small bead-like objects, with a hole through the middle, which are found together in such number and arrangement, that, although it is certain man did not make them, it is supposed he may have collected them, and that they were strung together and worn as a necklace; and if the fact that they were found all together in that manner when confirmed by competent observers, it would be very strong evidence.

Another case referred to is that of sharks' teeth perforated as if intended to be strung together, but when they were exhibited I found that a very small number were perforated in the same part of the tooth, and a great many teeth were perforated in all sorts of irregular manners. I next found that other objects besides these teeth,—pieces so large they could not be strung for necklaces at all, pieces of heavy bone,—were perforated in the same manner, but not always quite at right angles to the surface. Thus suspicion was raised at once. If that is the case, what is it that would bore a little way in and give the cavity its peculiar form? What is it that would bore obliquely into one and straight into another? I selected a portion of one tooth in which there was a small hole which did not go through. I had this carefully sawn across. I found it was of the soda-water-bottle-shape in which the pholades and other lithodomous molluscs commonly live. The suspicion was raised because of the want of symmetry and selection of the same part. But I do not therefore maintain that no people have worn teeth and other objects bored and strung together as ornaments. I have frequently seen myself amongst civilised people beautiful shells worn as necklaces with the outside off so that there is a pearly appearance. I have no doubt if you look round at the next party you go to you will find, here and there, there are such

* Williams and Norgate. London, 1875.

shells worn. It is a question of evidence. It is not the fact of there being a hole, or the fact of not having found the string, which I dwell upon as evidence for or against; but you must in each case ask what is the evidence upon which you rely. Is it juxtaposition? Is it the selection of the place where the hole is bored? Is it the general association and arrangement of the specimens?

There is no doubt the bones carved by man are commonly found together with other remains proving the antiquity of the deposit. These scored things are found right down in the deposit. You will find it clearly proved in this book, *Reliquiæ Aquitanicæ*, with full illustrations, a large number of which, by the courtesy of my friend, Professor Rupert Jones, I have been able to hand round, and you will find here a full description of the age and origin of the caves themselves, a most important point in such a question. If the cave or gravel terrace is high up and you refer it to the action of a river which is now far down in the valley below, that requires explanation, and you must consider probable length of time required for such geological changes. The paper referred to was one I had the honour of reading before this society some time ago.* The wood which I described was from a place called Dürnten, on a terrace which runs round the Lake of Zurich, on which there were in some places old lacustrine formations, ancient lake beds appearing to be overlapped by the later glacial deposits of the Alps. It was out of those that the matted and twisted twigs and pointed sticks were procured, but I showed that they could be accounted for by natural agencies. Then Mr. Kinahan's observations upon the antlers of the Irish elk impressing the bone in the peat, of course, are very important. And I have myself observed similar cases among bones found in Pleistocene gravels. I should carry the antiquity of man back to a very, very remote period. If you ask me what period in years, I would not be so rash as to say. I give no numerical estimate, but certainly he goes back to the time when the geographical conditions of this part of the country were entirely different. Some of our friends say they have found traces quite satisfactory to them in beds dating just before the glacial period. All I ask them to do is to give me a better proof than hitherto before I can admit that evidence,—not that I disbelieve we may

* March 3, 1879. See *Transactions of the Victoria Institute*, vol. xiii. p. 321.

some day find that man belongs to a much more remote antiquity than the evidence now before us would place him in. We may find that man existed in warmer climates during the period when our area was unsuited to man because of extreme glaciation. However it may turn out, all I do is to say we must have the very strongest evidence; and as we are discussing this matter from year to year, whenever a good case like this comes under my notice I bring it forward, in order that by-and-by nobody may beg the question by saying, "Here is a bone scored in the manner you allow man does score bone; and it is only man that can score a bone so." There is the point where I want to challenge him. Is it the fact that only man can score a bone so? No; there are other ways in which a bone can be cut and scored. That is the point I have taken up in this paper. I believe we must sum up the general question thus: As far as the evidence at present brought forward shows, no remains of man have as yet been found in this country in deposits of earlier date than the close of the glacial age.

The meeting was then adjourned.

REMARKS ON THE FOREGOING PAPER.

REV. J. M. MELLO, M.A., F.G.S., writes :—

Professor M'Kenny Hughes' paper on "Cuts on Bone" shows us that the mere occurrence of such cuts, however regularly disposed, is no absolute proof, *per se*, of the agency of an intelligent being such as man.

Professor Capellini's discovery in the Pliocene of Monte Aperto of the bones of a whale bearing rectilinear and circular incisions, may be cited in illustration of this subject. It was argued that the nature of the cuts on these bones was such that they could be ascribed only to intelligent agency; that had they been made, as was urged, by fish, then the two jaws of the fish would have left traces opposing each other, whereas none such were found, and the incisions were only on the convex side of the ribs, and on one side only of the carcass of the *Balœnotus*, as would have been the case had man discovered the stranded beast and attempted to deprive it of its fleshy covering. It was denied that the teeth of Squaloid sharks, which are found in the same deposit, could have made the incisions, as the direction of some of them was stated to be incompatible with such bites. On the other hand, M. Mortillet says that it has been shown that these teeth, with their finely-serrated edge, have actually left the trace of these delicate serrations in the bottom of the incisions; besides this, there are also other fish which are armed with isolated weapons capable of giving marks identical with some of those found, whilst they could not have been made by flints. In addition to this, we have the fact that no flint implements have been found with the *Balœnotus*, no other bones have been so marked, and the climax is reached when we are told that, at the time when the *Balœnotus* perished, the Tuscan hills had not even emerged from the sea. M. Delfortrie, as long ago as 1867, found incised bones in the Tertiary deposits of Léogran, and showed that they could be attributed to the numerous carnivorous fish whose remains abound in the same beds. These considerations have led to the abandonment of the supposed evidence of man's existence in Pliocene times derived from cuts on bone, and, unless such cuts were

found accompanied by other circumstances excluding the probability of other agency than that of man, it would be very rash to rely upon them in support of the antiquity of the human race.

Mr. N. WHITLEY, C.E., writes:—

As an illustration of the need of caution, I may mention that the late Dr. Falconer was of opinion that the high antiquity of man was indicated by an artificial incision on part of a reindeer's horn found in Brixham Cavern. But Mr. Busk, after examining the evidence, came to the conclusion that it was an accidental impression on the rib of a bear.—*Trans. of Roy. Society*, vol. clxiii. p. 564
