

## LETTERS TO THE EDITOR.

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## Discovery of the Teeth of Palæolithic Man in Jersey.

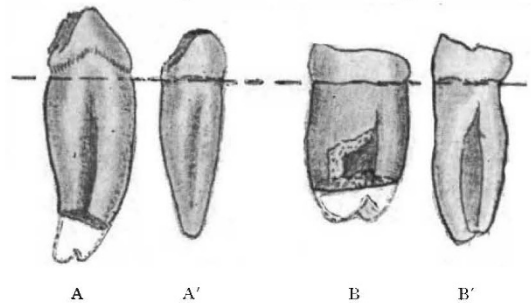
At the close of last year Messrs. E. T. Nicolle and J. Sinel reported (*Man*, December, 1910, p. 185) some of the results of an exploration of a Palæolithic cave-dwelling situated in the cliffs of St. Brelade's Bay, on the south coast of Jersey. Amongst the mammalian bones found on the floor of the cave, Dr. A. Smith Woodward and Dr. C. Andrews recognised remains of the woolly rhinoceros, the reindeer, and two varieties of horse. Abundant evidence of former hearths and numerous flint implements were found with the bones. Nine human teeth were also found, and it is to the nature of these I wish now to direct attention. The exploration of the cave was continued by Mr. R. R. Marett, reader in social anthropology, Oxford University, who is now preparing for publication a full account of the various "finds" made in the Jersey caves. By his courtesy I was given an opportunity of examining the human teeth, which are to be fully described by Mr. Francis H. J. Knowles. Three of the teeth, all of which are fossilised, but in an excellent state of preservation, belong to the upper jaw—a second left premolar, a first right and a second left molar; the six teeth from the lower jaw are a canine, first and second premolar and second molar of the left side, a second incisor and second molar of the right side. It is thus possible to reconstruct the dentition of this individual—for clearly all are from the same set—with a fair degree of accuracy. The recognition of each member of the series was made easy by their close resemblance to the teeth of the Heidelberg mandible, usually regarded as the oldest example of Pleistocene man yet discovered in Europe. The teeth of the Gibraltar cranium, which is probably a very primitive and early example of the Neanderthal type, were also of assistance. In many features the teeth of the Krapina men are recalled. There can be no doubt that the St. Brelade individual to whom these teeth belonged must be ranked as one of the most, if not the most, primitive of the examples of the Neanderthal type yet discovered.

When the Heidelberg mandible was found in 1907 embedded in the Mauer sand beds, at a depth of nearly 90 feet, anthropologists were surprised by the fact that while the crowns of the teeth did not greatly exceed modern dimensions, the mandible itself was so massive as to recall the form found in the orang and gorilla. The important fact brought home to us by the Heidelberg discovery was that the outstanding feature of the teeth of Pleistocene man, as compared with those of modern man, are the size and character of the roots of the teeth, not the size or character of their crowns. The stout roots and massive mandible indicated the roughness and toughness of the food, and the huge muscular strength exerted in mastication. Now, as regards the characters of the roots, these now found in the cave of St. Brelade exceed all human teeth previously discovered. Although the crowns of the teeth are smaller than those of the Heidelberg mandible, the roots are in most cases absolutely, and in other cases relatively, greater in their diameters, and indicating a smaller but still more powerful mandible in the St. Brelade individual.

The characters of the roots of the St. Brelade teeth may be seen from the adjoining figure. Two of the teeth are represented, A, the left lower canine from its proximal or mesial aspect, and B, the second lower molar, also from the same point of view. Typical specimens of the same teeth in a modern European are shown in A' and B'. The difference in thickness is striking; the length of the roots is nearly the same. So specialised are the tooth roots in Neanderthal man that Klaatsch and Adloff exclude this race from the ancestry of modern man. In the specimens figured of the second lower molars, both

St. Brelade and modern, the two roots are fused, but the process of fusion is absolutely different in the two. In the Brelade specimen the roots have become so hypertrophied and strengthened that they have come together as a result of overgrowth; in the modern molar the roots have dwindled and atrophied and become approximated by a process of retrogression. In the anthropoids, as in well-developed molars of modern man, the roots are well developed, separate, and spread. The roots of the first molars of modern man thus resemble those of the anthropoid, whereas the typical molars of the Neanderthal race appear to differ absolutely from the anthropoid type. At first sight it appears as if Klaatsch and Adloff must be right in tracing the root-forms in the molar teeth of modern man to a primate ancestor, and in excluding the highly specialised roots of Neanderthal man from the ancestry of the molars of modern man. In this I think they are wrong, for were retrogression to overtake the masticatory development of the Neanderthal type of man, then the apparent fusion of the roots would vanish, and they would again appear as separate structures as in the well-developed molars of modern man. This stage of retrogression can be seen in the teeth of the men of Spy. When we speak of the Neanderthal race we must remember that it probably endured throughout the Pleistocene period, one covering several hundred thousand years, and that we must expect to find many forms. The Spy men appear to belong to the latter part of the period; the Heidelberg and Brelade men to the earlier.

The teeth of Pleistocene man are highly specialised as regards their roots, a character in which they altogether depart from the anthropoid form. The change in root form



is best explained by the supposition that the human method of mastication had been evolved from the anthropoid long before the end of the Pliocene period. The peculiarity of the human method of mastication is the side to side or grinding movement of the lower jaw; in the anthropoid the movement is a crushing or cutting movement. The great canine teeth are implanted as maxillary guides to prevent any side to side action and ensure that the mandible will not slip or "skid" when the powerful muscles of mastication are at work. The human method of mastication was only possible when the canine teeth began to sink, as in the female chimpanzee, almost to the level of the other teeth. That the human canines were once anthropoid in form there can be no doubt; their embryological history leaves room for no other opinion on this point. When, however, the side to side movement in mastication was evolved, the implantation of the teeth had to be strengthened to meet the side to side strain. It is that stage which is preserved for us in Pleistocene man. It is very remarkable that in modern times the side to side movement has disappeared in highly civilised races, and the former cutting bite, ensured by the lower incisors passing up behind the upper, has appeared. With the improvement in food in more modern times, the usual primate form of tooth roots reappeared. In the St. Brelade dentition the first lower premolar is highly specialised, as is the case in the anthropoid; its specialisation originally depended on the fact that it had to serve as the opponent of the massive upper canine. The discovery, made under the auspices of the Société Jervaise, thus not only serves to show the extension of the Neanderthal type to the Channel Islands, but supplies most important facts bearing on the evolution of man.

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