The London Skull.

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THE merit belongs to Mr. Warren R. Dawson of having recognised the importance of the fossilised fragment of a human cranium found during the excavation for Lloyd's new building in the City of London. I have to thank him for the opportunity of studying so interesting a specimen. Both of us wish to express our appreciation of the ready manner in which the members of the Committee of Lloyd's have placed the specimen at our disposal for scientific examination, and of their generosity in presenting it to the Anatomical Museum of University College, London.

Mr. Dawson has written the following account of the circumstances in which the fossil was discovered :

"During 1924 and 1925 the site bounded by Leadenhall Street, Lime Street, and Leadenhall Place in the City of London, upon which the historic East India House originally stood, has been excavated for the erection of a new building for the Corporation of Lloyd's. Before the erection of the steel-work began, the central part of the site was cleared by means of mechanical excavators; but as the stanchions and girders rendered the available space more and more restricted, part of the digging had to be done by manual labour. The chance of finding fossil bones was slight in that part of the area in which the steam excavator was used; for this apparatus raises large masses of earth at each plunge and deposits its burden bodily into iron skips, which are in turn hoisted by cranes and emptied into lorries. On such parts of the site as were dug out by manual labour, however, fossil bones have from time to time come to light.

"By the kind permission of the Committee of Lloyd's, facilities have been given for a scientific examination of these bones, and the clerk of the works, Mr. G. T. Murton, has in all cases carefully noted the exact depths and the nature of the soil in which the finds were made. In March 1925 I exhibited three specimens at a meeting of the Zoological Society. These comprised the head of a femur and some molar teeth of the mammoth, found in the river gravel at depths of 20 and 37 feet respectively, and the ulna of a rhinoceros, which in Mr. M. A. C. Hinton's opinion, may provisionally be referred to the species *antiquitatis* Fischer. This ulna came from the redeposited London clay, which at this spot underlies the gravel at a depth of 40 feet. It was actually found at a depth of 42 feet. These specimens have already been described and figured (Warren R. Dawson and M. A. C. Hinton, Proc. Zool. Soc., 1925, Part 2, p. 793. The rhinoceros bone has been presented to the British Museum by the Committee of Lloyd's).

"At a later stage in the excavations some further remains came to light. Amongst these were the antlers and some limb-bones of the red deer (*Cervus elaphus*) from the river gravel at a depth of 30 feet, and the greater part of the skull of an ox from another part of the site at the 26 feet level. The most interesting fossil, however, is part of a human skull, recovered from the blue clay, the same formation as that in which the remains of the woolly rhinoceros were found, and at exactly the same depth, 42 feet, but in the western

portion of the site. The fragment of skull was broken into four pieces by a blow from the excavator's pick; but one of the pieces (a small triangular splinter from A in Fig. 1) was not recovered. The other three pieces were fitted together and exhibited at a meeting of the Zoological Society of London on October 20. On that occasion the erroneous statement was made that the skull was found at a depth of 26 feet from the surface; but a few days later the clerk of the works directed my attention to the error and informed me that the human fossil came from the blue clay in the 42 feet level.

"The misunderstanding arose from the fact that our inquiries concerning the 'skull' were believed to refer to the remains of the ox found at a depth of 26 feet, and not to the flattened plates of bone, which were not recognised as parts of a skull."

This correction eliminates the difficulty that presented itself in attempting to associate a mineralised human skull revealing interesting primitive traits with

FIG. 1.—Orthogonal projection of the left side of the London skull.

the conditions that obtained in the gravel at a level 16 feet nearer the surface. The deposit in which the human remains were found forms part of the third (or lowest) terrace of the Thames containing the characteristic late Pleistocene fauna. While there is every reason for believing that the fragment of skull was naturally deposited and formed part of a human being who was a contemporary of the woolly rhinoceros, its presumptive age must be assumed to be later than the Mousterian phase of culture.

The fragment includes the greater part of the occipital and left parietal bones and a portion of the right parietal. The whole of the masto-parietal and a considerable part of the squamo-parietal sutures are present (Fig. 1), and the position of the groove for the middle meningeal vein on the inner surface of the tongue of bone below A (Fig. 1) indicates that the latter reaches to within a millimetre of the coronal suture. In the figure the closed part of the lambdoid suture is indicated by the dotted line, and the form of the brain cavity is indicated by broken lines. The

area T represents the situation (on the endocranial cast) of the temporal boss, and P the singularly ill-developed parietal area.

The bones are completely mineralised and of a reddish-brown colour. The condition of the cranial

FIG. 2.—The inner surface of the cranium viewed from the front.
Drawn by A. K. Maxwell.

L, crista lunata on right side (left side of figure).
F, fossa area striata (with a ridge concentric with the crista lunata).
S, diminutive fossa area striata on left side.

sutures (lambdoid and sagittal) suggests an age of more than forty, but probably less than fifty years. The smoothness of the contour of the skull, and especially the faintness of the muscular impressions (Fig. 4), make it highly probable that the sex is female. The distinctness of the large lunate crest (Fig. 2, L), and the deep fossa striata (F) on the right side of the occipital bone—a reversal of the normal asymmetry—affords, as I pointed out in 1908 (*Brit. Med. Journ.*, Aug. 29, 1908, p. 597), clear proof of left-handedness.

The special interest of the relic arises from the fact that a skull which, from the circumstances of its deposition, is probably more recent than the known occurrence of the Neanderthal species, should reveal features so closely simulating those of the female crania of the Neanderthal type (those of Gibraltar and La Quina), and differ so profoundly from those of her (presumed) contemporaries of the Upper Palaeolithic period. The height of the cranium is no greater than that of the La Quina woman (and the restored Gibraltar woman's skull); and the maximum breadth of the cranium is intermediate between the measurements in these two members of the Neanderthal species. The greatest breadth of the endocranial cast of the London skull

is 136 mm., that of the La Quina cast being 130 mm., and of the Gibraltar cast 140 mm.

The resemblances in the brain cases are indicated, however, not merely by the measurements of height and breadth, but also by the form of the endocranial casts, both their profile (Fig. 3) and the modelling of their surfaces (Fig. 5). The astonishing similarity of the size and shape in the profiles of the casts of the brain cases in the London, La Quina, and the Gibraltar skulls is brought out in Fig. 3. When one recalls that the London cast reveals a form suggestive of the short brain of the Gibraltar type rather than the long brain of the La Quina type (Fig. 3), and that the Gibraltar brain was wider than the Londoner's, it seems probable that the volume of the latter cannot have been much, if any, more than 1200 c.c.

In his memoir on the Neanderthal race (*Roy. Soc. Phil. Trans.*, 1907) Prof. Sollas describes the skull of an aboriginal Australian that was no higher than the Gibraltar skull. On comparing a replica of the endocranial cast of this skull (S.A. in Fig. 3), which Prof. Sollas gave me some years ago, it is found to agree even more nearly in profile with the La Quina cast, the only significant difference being a greater fulness in the parietal area. The Australian skull is usually as lofty as that of the modern British woman, the outline of whose endocranial cast is represented in Fig. 3.

This serves by contrast to emphasise the remarkable similarity of the London skull with those of the Neanderthal group and the exceptional Australian (S.A.). The cerebellum alone reveals any marked contrast. The fulness of this part of the brain in the London skull differs from the flattened form (cerebell.) of the Neanderthal and closely conforms to the type found in *Homo*

FIG. 3.—The outline of the endocranial cast of the London skull seen in profile from the left (thick line), compared with the Gibraltar and La Quina women and Prof. Sollas's Australian (S.A.), described in the *Roy. Soc. Phil. Trans.*, 1907, p. 325, as well as those of Pithecanthropus, Eoanthropus, and a random sample of a modern woman.

sapiens, as well as, curiously enough, in the Piltdown cast (Eoanthropus).

The modelling of the surface of the cerebral hemisphere in the endocranial cast (Fig. 5) reveals features of special interest. The localised swelling in the posterior

part of the temporal area (the temporal boss marked T in Fig. 5) is clearly defined, as it is in casts obtained from the La Quina, Piltdown, and Java (*Pithecanthropus*) crania, in all of which its distinctness is due partly to the lack of fulness in the parietal area (P). Even in the flat endocranial cast of Prof. Sollas's Australian skull the parietal area is prominent and no localised temporal boss is apparent. Though the parietal area is

FIG. 4.—Back view of the London skull. The prominent boss on the right side at F is associated with the deep fossa striatæ (Fig. 2).

fuller in the London cast than in that of the La Quina skull, it resembles the latter more nearly than it does the Australian. The contour of the latter in Fig. 3 (S.A.) is merely one of the expressions of this increased parietal development. In this, and in fact in most other respects, however, the London skull differs profoundly from the condition usually found in *Homo sapiens*, even in such early examples as the Cromagnon and Combe Capelle crania, the brain cavities of which would, if the contours were shown in Fig. 3, much more nearly resemble the modern than the ancient London woman.

Several of the skulls of the Upper Palæolithic are remarkable for their flatness; but none of them approaches so nearly as the London skull does (Fig. 4) the shape distinctive of the Neanderthal species.

The Solutrean skull found in 1891 at Brünn (Moravia)—embedded in loess in association with the woolly rhinoceros and mammoth—was claimed by Makowsky to belong to a type intermediate between *Homo neanderthalensis* and *H. sapiens*. In 1906, Schwalbe argued that it conformed to a primitive type of the species *sapiens*, because the cranium was much higher than the Neanderthal form and lacked the distinctive type of eyebrow ridges. In spite of this, several anthropologists (see, for example, Stolyhwo in *Globus*, December 17, 1908, p. 363) refused to accept Schwalbe's view. The London skull affords much more definite evidence in support of these claims for the existence of an intermediate species than any of the Moravian specimens or Stolyhwo's Novosiolka skull reveals. In fact, the London endocranial cast (Fig. 5) reproduces the form of the Neanderthal type so nearly that the question of the possibility of the survival into Aurignacian times (in Britain) of a stray representative

of the species *neanderthalensis* is forced upon our consideration.

In spite of these considerations, however, one is not justified in claiming, on the evidence of data derived solely from the posterior part of the skull, that the London skull belongs to the Neanderthal species or to an intermediate type. The front end of the cranium or the face would have provided decisive evidence for the determination of the species; but unfortunately these parts of the skull are missing. Hence, as the fossil was found in a deposit definitely later than that in which Neanderthal man is known, and taking into consideration the range of variation in modern man, as displayed in the Australian skull (S.A. in Fig. 3), it would not be justifiable to claim this fragment of a skull as conclusive evidence of the survival of a member of the Neanderthal species into Upper Palæolithic times.

The thinness of the cranium is not a certain criterion of identity with the species *sapiens*, for the London skull is quite as thick as that of the La Quina woman.

In support of these tentative suggestions, the size and fulness of the cerebellum must be given some weight as an indication of affinity or identity with the species *sapiens*. The filling out of the parietal area, slight though it be, may possibly be indicative of a rank above that attained by the Neanderthal brain.

As to the date of the London skull, perhaps the most relevant facts are provided by the excavations in 1892 for the New Admiralty Buildings in London (Lewis Abbott, *Proc. Geol. Assoc.*, 1892, vol. 12, p. 346). The lowest terrace of the Thames provided evidence

FIG. 5.—Left side of endocranial cast of the London skull.

of the association of the Pleistocene mammals with a Solutrean implement.

Whatever the fuller study of this remarkable skull may reveal, the fossil is certainly by far the oldest human relic yet found in the City of London and presents probably the nearest resemblance to the Neanderthal type ever found in a member of the species *sapiens*.

In the task of investigating this fossil I have had the benefit of the valuable advice of Profs. D. M. S. Watson and J. H. McGregor (of Columbia University).