

## The Place of the Broken Hill Skull among Human Types

by L. H. WELLS

THE discovery of the Broken Hill skull in 1921 had a tremendous impact upon anthropological thought. This was the first African example of fossil man not recognizably of modern *Homo sapiens* type, and the first plausible evidence in favour of Darwin's suggestion that Africa might have been the scene of Man's first appearance. Yet as recently as 1947 it appeared impossible to discuss seriously the significance of this find, in view of the many queries which enveloped it.

That the Broken Hill fossil can now be made the central theme of a study, is due almost wholly to the work of Dr Desmond Clark in elucidating the age and associations of this find. His findings indicate that if the Broken Hill skull is less ancient than some students had hoped, it is not so recent as certain sceptics had maintained. The evidence now available (Clark *et al.*, 1950) leaves little doubt that the skull should be associated with a culture of proto-Still Bay character, which belongs within the Gamblian period (broadly Upper Pleistocene) and more probably to its later than its earlier portion. This conclusion, as we shall see, aligns the Broken Hill find with several other remarkable human fossils, both African and extra-African.

At first sight the Broken Hill skull presents a remarkable and superficially gorilla-like appearance. Nevertheless, as Pycraft (1928) emphasized, most of its distinctive features are specialized rather than truly archaic. Among these are the great size of the eyebrow ridges, whose vertical thickening exaggerates the recession of the frontal region; the vertical elongation of the face, affecting both the orbito-nasal and infra-nasal regions but especially the latter; and the very large area of attachment for the neck muscles, which clearly provided the necessary counterpoise for the face and brows. Much stress has been laid upon the almost complete absence of an infraorbital or 'canine' fossa. However, Weidenreich (1943) has shown that the modelling of this region in the Broken Hill skull cannot be considered primitive; moreover it is hardly if at all outside the range of variation in modern human skulls.

The nearest counterpart to the Broken Hill skull so far discovered in Africa is the braincase found in 1953 at Hopefield near Saldanha Bay, Cape Province (Drennan, 1953; Singer, 1954). Archaeologically, though not necessarily chronologically, the Hopefield find seems to belong to an older horizon than does that of Broken Hill. Comparison of these two specimens immediately suggests that they belong not merely to the same species but to the same race of Man; there is indeed much less difference between them than is to be found, for example, among South Australian skulls. It must, however, be remembered that the face of the Hopefield man is not yet known. Moreover, while the brows and frontal region of the Hopefield fossil are practically identical with those of the Broken Hill skull, the occiput of the Hopefield specimen is steeper and the area for the neck muscles appears to have been shorter. In addition, the external auditory meatus and temporo-mandibular joint appear to have been situated further back than in the Broken Hill skull, so that the temporal fossa was longer. This inference is supported by the frag-

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ment of the mandibular ramus. These differences suggest that the Hopefield skull carried a less elongated face than that of Broken Hill.

Two other African finds demand close comparison with the Broken Hill remains; these are the crania from Lake Eyasi in Northern Tanganyika (Weinert, 1939) and from Florisbad near Bloemfontein, Orange Free State (Dreyer, 1935). The Eyasi fragments have been assigned to an Upper Pleistocene horizon closely comparable archaeologically to, but possibly earlier chronologically than, that indicated for the Broken Hill find (Leakey, 1946). Although the reconstructed braincase (Eyasi I) is smaller and more slender in build than the Broken Hill skull, the two are strikingly similar in contour. The differences are in fact of the order of those found between the two sexes in robust types of modern man. A further argument for supposing Eyasi I to be female is provided by the occipital fragment of a second skull (Eyasi II). This piece is more massively built than Eyasi I and bears a prominent occipital torus comparable with those of the Broken Hill and Hopefield skulls; in general contour the Eyasi fragment seems to correspond more closely with the Hopefield specimen. While the evidence may not suffice to assert categorically that Eyasi I is a female of the Broken Hill-Hopefield group, I think this possibility must be seriously considered. If Eyasi and Broken Hill are distinct, then Eyasi would almost certainly be the earlier and more generalized type.

Turning to the Florisbad find, both the archaeological and the chronological position of this fossil have been much debated. There are plausible grounds for assigning it to an archaeological horizon essentially the same as that of the Broken Hill and Eyasi specimens, and I am not convinced by the arguments for carrying it back to a much earlier period. The minimal antiquity of about 40,000 years indicated by  $C_{14}$  estimation of the overlying deposit is quite acceptable; evidence obtained from the Haa Fteah site in Cyrenaica (McBurney, Trevor and Wells, 1954) shows that deposits of such antiquity fall well within the limits of the Upper Pleistocene.

Compared with the Broken Hill skull, the Florisbad fragment is distinguished by having a much wider braincase, an extraordinarily broad and transversely flattened frontal region, a much more slender supra-orbital ridge, and a very wide face with deep infra-orbital excavations. Clearly it is not possible immediately to assign these two specimens to a single type, nor can either of them be regarded as directly ancestral to the other. They could however very well be divergent specializations of the same fundamental type.

An attempt to visualize a common ancestor for the Broken Hill and Florisbad skulls leads almost inevitably to something resembling a very coarse example of the South Australian type. Galloway (1938) has made an instructive comparison between the Florisbad fossil and the 'proto-Australian' Wadjak skull from Java. The Broken Hill skull can be more readily compared, as was pointed out by Dubois (1937) with the Ngandong group of skulls from Java, which are regarded as Upper Pleistocene in age and thus broadly contemporary with the African fossils. Even if some of the resemblances between the Broken Hill and Ngandong skulls are to be ascribed to parallel specialization, these effects seem to be superimposed upon a fundamental similarity of skull structure. It thus seems quite possible that the Broken Hill and Ngandong types were derived from a not very remote common ancestor.

The Broken Hill skull has naturally been freely compared with the Neandertal type of the earlier Upper Pleistocene of Europe. It must however be conceded that the most obvious similarities are to be found in features which may well be due to convergent specialization. Sergi (1948) has emphasized the divergent trends in cranial development represented by the Broken Hill specimen and by the classic Neandertal type, which is associated with the opening phase of the last (Würm) glaciation. However, in the Ehringsdorf skull which belongs to an earlier (last interglacial) horizon, we may see a fundamental cranial morphology less remote from that of the Broken Hill man. It seems at least conceivable that the Broken Hill and Ehringsdorf fossils are derived from a common ancestor not further back than the Middle Pleistocene, and that the Ehringsdorf type could have given rise in its turn to the 'classic' Neandertal. The revised recon-

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struction of the Mount Carmel skull Skhül V (Snow, 1953) seems to correspond essentially with the Ehringsdorf skull.

We thus have evidence that during the Upper Pleistocene a series of broadly comparable human types was dispersed throughout the world. The phyletic schemes which have been constructed to express the relationships of these to each other and to earlier and later types can be reduced to three main patterns. One of these postulates a fundamental dichotomy between 'palaeanthropic' (neandertaloid) and 'neanthropic' (*Homo sapiens*) stocks. The various Upper Pleistocene fossils which have been reviewed would be regarded on this view as variants or local races of the fundamental Neandertal type, comparable with but wholly distinct from the existing races of *Homo sapiens*.

A second and radically different conception postulates that in each of the large land areas of the world there has been local human evolution through a comparable sequence of stages, pithecanthropic, palaeanthropic and finally neanthropic. The Broken Hill and other African fossils would on this view be considered as representing a 'neandertaloid' stage in the ancestry of existing African types of Man.

The third and in my estimation most probable scheme envisages that the primitive human (pithecanthropic) stock gave rise directly to a basic type of *Homo sapiens*, which might be loosely described as 'proto-Australoid'. This type rapidly became widely dispersed and underwent regional differentiation. In each region, however, it tended to diverge into a spectrum of types ranging from pedomorphic (infantile) to gerontomorphic (acromegaloid). The Broken Hill, Ngandong and Neandertal types on this view represent parallel acromegaloid specializations in divergent offshoots of the primitive *Homo sapiens* stock. These extremely specialized types appear largely to have become extinct, but may through hybridization have been in part ancestral to types still surviving.

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