

NEWS AND VIEWS

Early Man in the East Rudolf Basin

EAST AFRICA has long been recognized as one of the best sources of early man material. Dr Louis Leakey's persistent faith in Olduvai Gorge in Tanzania has been clearly justified in the past two decades, and now field work by his son Richard Leakey and his colleagues in the Lake Rudolf area, north of Olduvai, is providing discoveries which may well be equally significant in the study of human origins; for example, no less than sixteen specimens of hominid and a rich collection of vertebrate remains were recovered by the 1970 expedition to the area (see page 241 of this issue). The deposits to the east of Lake Rudolf in Kenya, and in the Omo River Valley to the north, in Ethiopia, extend back in time from those at Olduvai and thus add another two million years to the history of human evolution. Although the oldest levels at Olduvai are dated at just under two million years, the oldest at Omo are probably just under four million years, so that at sites in East Africa can be seen evidence of the various stages of human evolution—the older levels have the remains of the australopithecines and the younger levels have, in succession, early hominines and, finally, fully sapient types.

The fossil hominid material recovered by both the 1969 and 1970 seasons in the east Rudolf area is significant for several reasons. The chief interest is Richard Leakey's suggestion that the genus *Homo* is represented there in deposits which are possibly more than one million years old. Although the evidence for *Homo* at Koobi Fora and Ileret is certainly not indisputable, the fragmentary mandible (KNM-ER-730) does seem to present a complex of characters not found in other hominids known from this period of time. It may even be the best evidence so far of the genus before the Pleistocene hominids from Java. The newly discovered limb bones, so far unanalysed, may also be of considerable importance, because although several femoral ends have been attributed to the australopithecines no remains of the shaft have previously been found. If KNM-ER-736 and 738 can confidently be assigned to that genus then they will indeed be unique and can be expected to add considerably to knowledge of that group. Moreover, the limb bones and the locomotory patterns that they reflect form a component of the total trait complex of the form represented and thus may contribute significant discriminating parameters for taxonomic purposes. The third important result of field work in the Lake Rudolf area is the reiteration of the contemporaneity of the "robust" and "gracile" australopithecine types and the morphological stability of these types through a long period of time. Sites are already known outside the Rudolf area which show the robust and gracile types coexisting apparently contemporaneously, for example, Bed I at Olduvai and Swartkrans in South Africa. Furthermore, the site at Sterkfontein, near Swartkrans, shows a wide range of size differences but so far without clear evidence of the larger form.

Richard Leakey's suggestion that the size and morphological differences between the two types relate to sexual dimorphism is not a new idea, but it has not so far been widely accepted. The theory is attractive to some workers because it would avoid certain problems of competitive

exclusion, sympatry and morphological intergrades, all of which would cease to be taxonomically troubling if sexual dimorphism were acceptable. But how then to explain why some sites contain predominantly one type only? Some workers consider it unlikely that just one sex, if the australopithecines were indeed widely sexually dimorphic, would be preserved at these sites; the continuing field work, however, has not entirely supported this point of view. Although modern man is not highly sexually dimorphic, some of the other ground living higher primates are; gorillas, chimps and baboons are the obvious examples.

In contrast with the single species idea is the view that at least two taxonomic groups are indicated by the heterogeneous australopithecine remains. In the view of some workers this polymorphism corresponds to generic distinctions; to others it represents specific or sub-specific groupings. Dr John Robinson's "dietary hypothesis" (*Nature*, 205, 121; 1965) states that dental differences between the robust and gracile types reflect differences in diet, and consequently in behaviour, with the robust type being predominantly herbivorous and the smaller type omnivorous. This explanation has found recent support in the work of Dr Clifford Jolly (*Man*, 5, 5; 1970), who has defined a "graminivorous" (seed-eating) dentition in some baboons and points out certain similarities between this and the dentition of the robust australopithecines. The dietary hypothesis has the advantage of solving the problem of sympatry because in this way the two types could coexist. The very long period of coexistence of the two types of australopithecines would then indicate that they were not in serious competition for the same resources; either they were members of the same population or they made different demands on the environment.

The taxonomy of the australopithecines is one of the most hotly disputed topics in palaeoanthropology today. It is possible, however, that the new discoveries of limb bones at east Rudolf may be useful in moderating this controversy and at the same time aid in the definition of valid taxonomic criteria which are now lacking. If the limb bones from the two types can be shown to have different locomotory patterns, then more than one taxonomic category is likely to be represented. Equally, similarity of the locomotory pattern could be held as evidence of one species because two hominid lines, already similar in many respects and with the same locomotory adaptation, would suggest an extraordinary parallelism.

Leakey's suggestion that the genera *Homo* and *Australopithecus* were evolving along parallel lines in East Africa might find some support in the recently described robust australopithecine from Chesowanja (*Nature*, 230, 509; 1971). Although the authors have described this specimen as less specialized and possibly more adaptable than previously known robust types, a completely objective analysis is difficult because of its poor state of preservation. It must be pointed out, however, that such parallelism between closely related genera, if it indeed existed, would have been unlikely to continue locally for a long period because of competition.