

Early Man in East Africa

TO discuss the early human remains recently discovered by the East African Expedition of Dr. L. S. B. Leakey, the Royal Anthropological Institute convened a Conference on March 18 and 19 to examine the material which is now assembled in Cambridge. After hearing Dr. Leakey's exposition of his discoveries, and a general discussion of questions arising therefrom, the conference appointed committees to report respectively on the geological, palæontological, anatomical, and archaeological evidence. The reports of these committees were submitted to the conference as follows:—

GEOLOGY

The Geological Committee has considered the problems placed before it from the point of view of the material available for examination and of the stratigraphical evidence. (a) Material: i. *Kanjera*. The Committee agreed that the fragments of skull picked up from the surface have the same source as those found *in situ*, their state of mineralisation being similar. ii. *Kanam*. So far as can be determined from the tests made, the mineralisation of the Kanam mandible seems to be the same as that of the rhinoceros bone found in the same deposit. (b) Stratigraphical. Of the geologists present on the Committee, two have seen the Kanjera deposits, although not with Dr. Leakey. Others have had experience of similar strata in East Africa, and the rest have brought to bear on the question their general experience of stratigraphical problems. From the evidence supplied by Dr. Leakey, the Committee can see no escape from the conclusion that the Kanjera skull fragments occur in the calcareous deposit which yielded the following fauna: *E. antiquus recki*, etc., as in the palæontological report below, and the implements of evolved Chellean type. Further, that the Kanam mandible was derived from the horizon which yielded implements of pebble-tool type only. This horizon also furnished the following fauna: two species of mastodon, two of primitive elephant, a species of deinotherium and a small variety of hippopotamus.

The Committee, after considering the character of the Kanjera deposit, does not believe that the fragments can have been introduced into the calcareous deposit at a later date, and feels clear that the two fragments said to be found *in situ* belong in fact to the original deposit. Also, those members of the Committee who have seen the deposits in question, support Dr. Leakey in his view that the Kanam and Kanjera deposits antedate a period of great local tilting and faulting and of volcanic activity.

PALÆONTOLOGY

The Committee on Palæontology reports that Kanam East and Kanam West exhibit differences only in the relative numbers of the fossils of different groups. With the human jaw at Kanam West were found close relatives of the two types of rhinoceros still living in the region, a small hippopotamus, a pig, an antelope, fragments of mastodon, two teeth of a very large deinotherium and remains of *Trionyx*. In Kanam East the collection consists chiefly of mastodon with a primitive elephant, deinotherium,

and a few specimens of hippopotamus, rhinoceros, horse, and a young monkey.

The fossils from Kanjera have a later aspect. One elephant has dental plates as deep as those of *E. antiquus*, and all the remains of elephant are of Asiatic or European type. At least two antelopes, *Hylæochaerus*, *Phacochærus*, and a large pig distinct from that of Kanam West, have a very modern appearance. A baboon is remarkable for its comparatively short face. One equine upper molar approaches *Hipparion*, if it does not actually belong to that genus. Typical *Equus* also occurs. Fragments of mastodon, rhinoceros, a giraffoid, hippopotamus, and a carnivore have also been found.

The Committee thinks that the Kanam deposit should be referred to the Lower Pleistocene, in which the deinotherium and mastodon are survivals from the Upper Pliocene. It also thinks that the Kanjera fauna cannot be later than the Middle Pleistocene.

ANATOMY

The Anatomical Committee reports as follows:—

A. *Kanjera* No. 3.—(1) These specimens exhibit a condition consistent with great antiquity, and the Committee agrees to the correctness of associating all the fragments in question. (2) In the specimens submitted to them the Committee has observed no characteristics inconsistent with the reference to the type of *Homo sapiens*. (3) The absence of a frontal torus seems to exclude Kanjera No. 3 from association with Neanderthal types. (4) Pending further inquiry, the Committee is not able to cite examples of cranial vaults of the thickness characterising Kanjera No. 3 in non-pathological examples of the modern types of *Homo sapiens*: but it notes the occurrence in Piltdown (*Eoanthropus*) and the Boskop calvaria. (5) The Committee has noted the presence of a transverse occipital suture, which is rare in modern crania. (6) While reconstructions must be to some extent conjectural, yet those submitted agree in indicating a cranial length of 200-209 mm. (7) The Committee has observed no detail in the fragment of femur inconsistent with its inclusion in the type of *Homo sapiens*.

B. *Kanjera* No. 1.—(1) This specimen has been reconstructed by Dr. Leakey and Mr. McInnes from numerous fragments. The Committee accepts their association but is not able to exclude the possibility of some distortion of the actual specimen being manifested in the reconstruction. (2) The Committee sees no reason to distinguish between Kanjera No. 1 and No. 3, either in regard to the degree of mineralisation, or in regard to antiquity. (3) The Committee notes that Dr. Leakey's reconstruction and his placing of the two main pieces of the specimen provide a maximum length of 200 mm., and that the mid-sagittal contour is strongly suggestive of that which has been accepted by it as reasonably representative of Kanjera No. 3. (4) The Committee remarks that Kanjera No. 1 does not possess the great thickness seen in Kanjera No. 3, also that the transverse diameters seem to be less in No. 1 than in No. 3. (5) On the whole survey, the Committee is prepared to associate Kanjera No. 1 and No. 3 as possibly female (No. 1) and male (No. 3) representatives of the Kanjera type.

C. Kanam.—(1) The Committee, having examined the fragment of mandible, agrees that the appearance of this specimen is not inconsistent with the high antiquity assigned to it. (2) With the possible exceptions of the thickness of the symphysis, the conformation of the anterior internal surface, and what seems to be a large pulp-cavity of the first right molar tooth, the Committee is not able to point to any detail of the specimen that is incompatible with its inclusion in the type of the *Homo sapiens*. (3) In arriving at this conclusion the Committee has had regard to the conformation of the parts about the chin. It has noted that the incisor teeth show signs of crowding but has detected no indication of unusual size in the canine teeth.

ARCHÆOLOGY

The Archæological Committee, after examining the material exhibited, submitted the following conclusions:—

At Oldoway, in a continuous stratified deposit, which should henceforth rank as a standard section, a worked pebble industry in Bed I is supplemented in the lower part of II by an early Chellean industry with *coup de poing* and rostrid forms: and the pebble types persist for a while. There are indications of continuity and of a gradually evolving technique between the pebble industry and the Chellean technique. In Bed III the 'later' or 'evolved' Chellean passes on into highly evolved Acheulean industry, which becomes fully evolved in Bed IV. Though scraper types, round butt hand-axes, and flake implements occur, they are not dominant at any point in the series.

At Kanam and Kanjera, stratified deposits include a similar series of industries, and therein the Kanam jaw is associated with the pebble industry, and the Kanjera skull fragments with Chellean implements

corresponding with those of the upper part of Oldoway II.

The pebble industry of Oldoway I has no precise counterpart in western Europe, but is certainly anterior to the Early Chellean of Bed II. The Early Chellean culture of Bed II at Oldoway corresponds typologically with the industries of Early Pleistocene deposits in western Europe; and the uppermost industries of Oldoway IV with those of the Thames valley gravels with Acheulean implements. The types from Zambezi gravels and other deposits in South Africa indicate comparable lapse of time.

There is no reason to doubt that the series from East Africa is of at least equal antiquity with the European, and it may even begin somewhat earlier.

The Conference, after detailed discussion of these reports, and of supplementary information furnished by Dr. Leakey and Mr. McInnes as to the circumstances of their discoveries, accepted the reports; congratulated Dr. Leakey on the exceptional significance of his discoveries; and expressed the hope that he may be enabled to undertake further researches, seeing that there is no field of archæological inquiry which offers greater prospects for the future. It especially urged the early organisation of another expedition.

The following were present and concurred in the above conclusions:—Sir Arthur Smith Woodward (chairman), A. L. Armstrong, H. Balfour, Miss D. M. A. Bate, P. G. H. Boswell, M. C. Burkitt, V. G. Childe, L. C. G. Clarke, W. L. H. Duckworth, H. J. Fleure, C. Forster Cooper, V. E. Fuchs, A. C. Haddon, A. T. Hopwood, O. T. Jones, Sir Albert Kitson, L. S. B. Leakey, D. McInnes, E. H. Minns, J. Reid Moir, J. L. Myres, T. G. Mollison, F. Oswald, K. S. Sandford, R. A. Smith, W. J. Sollas, J. D. Solomon, Miss M. L. Tildesley and D. M. S. Watson.

Utilisation of Coal

MR. H. T. TIZARD, rector of the Imperial College of Science and Technology, presided at a symposium on the utilisation of coal arranged by the British Science Guild and held at the Royal Institution on March 27. The large audience, which was representative of coal, coal-gas and oil interests, scientific and technical societies, trade unions and members of Parliament, was addressed by Capt. Bernard Acworth, Mr. Stephen Lacey, Eng. Rear-Admiral W. Scott-Hill, and Mr. A. C. Hardy, after which there was a discussion.

In his opening paper on the "Economic Significance of Coal", Capt. Acworth made special reference to legislative differentiation unfavourable to the expansion of the coal and coal-gas industries. He asserted that the chief consumers of oil fuel are heavily subsidised out of the public purse. The British taxpayer pays most of the cost of maintaining aircraft, passenger and goods traffic: the taxpayer has likewise had to pay £1,600,000,000 to make our roads fit for motor traffic, and part of this vast sum is an indirect subsidy to the oil companies as it is spent on oil residuals. In addition, certain public authorities have made compulsory the use of electricity for lighting and heating purposes in subsidised houses.

Although the demand for fuel has greatly increased during the past twenty years, the output of coal

in Great Britain has decreased by 67,000,000 tons a year since 1913, this decrease indicating the extent by which imported oil has replaced coal. This replacement is represented over the period by an unfavourable trade balance of £960,000,000; and one million unemployed involving an annual public burden of £65,000,000. These facts, he urged, should be taken into account by our legislators in considering the relative costs and advantages of coal and oil as a fuel.

Mr. Stephen Lacey, who dealt with the "Development of the Use of Gas", claimed that the part played by the gas industry as an instrument in the efficient utilisation of coal is invariably under-rated. The carbonising process in gas and coke-oven works is the most efficient known means of converting coal into smokeless fuel and other convenient forms of heat. One ton of coal carbonised in a gas works will supply the same amount of useful heat as two tons of raw coal used either for direct heating or converted into electric energy, but at present only ten per cent of the total amount of coal used in Great Britain is carbonised in gas works as compared with twenty-five per cent of raw coal burnt for domestic purposes. This is indicative of the conservatism which has to be overcome, but progress is being made.

The use of gas for industrial undertakings is