

gated, and values of the 'quality index' corresponding to the quality of meat when deterioration is first detected by sensory evaluation are being studied.

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ANTHROPOLOGY

Lower Palaeolithic Hominid and Pebble-industry in Hungary

IN the neighbourhood of the village of Vértesszöllös, to the north-west of Budapest, a rich Lower Palaeolithic site has been found: the results of the first excavation have already been published¹.

In 1964 a great part of the site was excavated, and this resulted in some new finds, which included a rich fauna as well as several thousand primitive pebble-tools.

The pebble-industry in Hungary, called *Buda*-industry, is related to the Oldowan industry in Africa, the Choukoutienian in China, the Sohan in India and to the Clactonian in England so far as implement-types is concerned. The most characteristic forms are pebble-choppers, chopping-tools and polyhedrons. On the basis of its well-determinable stratigraphical conditions (the travertine complex bearing the finds is situated on a high, old—possibly fourth—Pleistocene terrace) and of the rich vertebrate fauna, it was possible to compare our site with the Upper Biharian (that is, Mindel 1/2 and Mindel 2).

During the 1964 excavations four separate cultural horizons were found. The two lower ones were in solid travertine and in lime-mud, while the upper two were at the base and at the top of the overlying loess. The loess again was covered with another layer of travertine several metres thick. It was the lowermost layer which yielded the richest material; this represented a continuous living surface at the base of a former tectarata (calcareous tuff basin). The material consists of numerous broken bones, and some small hearth, stones and chips. Of the three upper layers, that at the base of the loess was almost as rich in material as the lowest layer, but it covered a smaller area. The tools—so far as can be stated after a preliminary investigation—do not show any noticeable changes at the different cultural horizons. However, the fauna shows a considerable change: the vertebrate (rodent) material found in the loess belongs to cold-enduring species while those in the lower layers belong to a warmer climate: in the upper layer, beside the northern type red vole (*Myodes* [= *Clethrionomys*] cf. *rutilus*), there are *Microtus*-species and *Ochotona*, etc., in great abundance, thus indicating a cold climate. On the other hand, in the lower layers, Murines (*Apodemus*, *Mus*), *Cricetus* and *Glis* accompanied by *Pliomys* (dying out later), and *Microtines*, which belong to a relatively warmer climate, indicate more temperate climatic conditions.

During the excavation, several hundredweights of lime-mud from the cultural layer were washed out and sieved, and taken to the Hungarian National Museum for preparation. The washing process and the collecting from the washed material took several months. It is for this reason that the most significant find of the excavation only came to light early in 1965: namely, tooth-remains of a hominid from the washed material of the lowest cultural horizon. The hominid remains consist of a left deciduous canine, the fragment of a first deciduous molar and fragments of another molar belonging to a

child's jaw. Even at first glance it was obvious that the teeth are characteristic of the *Pithecanthropus-Sinanthropus* group. Dr. A. Thoma has been asked to undertake detailed examination.

From the washed material where the human teeth were contained, the following mammalian species were also determined (there are only one or two new species in this list as compared with that already published): *Citellus* sp. (*citellus*-group), *Cricetus cricetus* ssp., *Myodes* [= *Clethrionomys*] cf. *glareolus* (Schreber), *Pliomys* sp., *Arvicola* sp., *Phaiomys* sp., *Microtus (Pitymys) arvalidensis* (Kretzoi), *Microtus conjungens* Kretzoi, *Microtus arvalis-agrestis*-group, *Apodemus* sp. (*sylvaticus*-group).

The decreasing numbers, from the base upwards, of the *Pitymys arvalidensis* and the greatly increasing numbers of the *Microtus conjungens*—an intermediate form between *Microtus hintoni-gregaloides* and *Microtus gregalis*—are a clear indication of a deteriorating climate during the laying down of the upper layers of the site.

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Cranial Capacity of the Hominine from Olduvai Bed I

PROF. P. V. TOBIAS¹ has produced a range of values for the cranial capacity of the 'pre-*Zinjanthropus*' juvenile from Bed I, at the *F.L.K.N.N.* I site at Olduvai Gorge, Tanganyika. This communication presents evidence which confirms Tobias's calculations.

The figures which Tobias calculated on the basis of his 'B/A' ratio, the parietal-to-total volume, were 642.7–723.6 c.c. These figures and the method of obtaining them have been criticized², and it is generally held that his figures are questionable. The main reason for this unwillingness to accept Tobias's figures rests with his method of reconstruction of a partial endocast from the parietal fragments. Pilbeam and Simons² hold that the articulation of the parietals along the sagittal suture would make a considerable difference in the parietal volume, since a more acute angle of articulation along the suture would reduce the width at the base, thereby decreasing the volume.

Since the fragments are from both sides of the cranium, accurate reconstruction is possible by mirroring one side with the other. Thus, the reconstruction should be reasonably correct, disregarding for the present the question of articulation. Assuming also that the range of values found for partial endocasts, parietal-to-total, is within the values obtained (50.22–56.54 per cent), the question of articulation requires consideration.

Using the photographs and scale provided by Tobias¹, a full-scale drawing was made of the endocast both as seen from above and behind. Using the maximal breadth and height as a plane, a template was constructed of the outline of the endocast in this plane, from one side. By simply turning the template over, the mirror image could be traced. Using the most superior point in the mid-sagittal plane as a pivot point, the template was rotated a number of times, and outlines traced on fine-quality tracing paper. A 'reference' outline was made to conform with the scale of the published photograph. The maximum breadth in the coronal plane was varied from the 'reference' value in both directions. In other words, the angle of articulation at the sagittal suture was made both more and less acute. Each outline was traced, giving a total of four complete outlines: (1) at scale; (2) minus 0.5 cm each side; (3) minus 1.0 each side; (4) plus 0.5 cm each side. Thus, maximum breadth was varied from plus 1.0 cm to minus 2.0 cm, a range surely greater than necessary.

A planimeter was then used to obtain the areas enclosed by each of the four outlines, five readings being