

ON A PRESUMABLY PLEISTOCENE HUMAN TOOTH  
FROM THE SJARA-OSSO-GOL (SOUTH-  
EASTERN ORDOS) DEPOSITS\*.

BY

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(1 Plate and 1 Text figure.)

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ON THE DISCOVERY AND PROBABLE ANTIQUITY OF THE TOOTH.

In the course of our excavations of 1922-23 in the Sjara-osso-gol palaeolithic levels (v. 1.), no human bony remains had been noticed, except one femur and some other pieces of very doubtful origin.

Recently, while examining occasionally a residuous material of those excavations, we were surprised to notice, amongst *Gazella* teeth and pieces of *Struthiolithus*, a human upper incisor, strongly fossilized.

The great antiquity of this tooth is not absolutely certain, because it was collected (as the associated fossils) in a place where Pleistocene sands are more or less mixed with the basal gravels of a modern terrace of the Sjara-osso-gol. Nevertheless, the grade of fossilization of the specimen and the fact that it has been found in association with a large number of undoubtedly fossil bones (*Rhinoceros*, *Elephas*, etc.) made us fairly sure that it is of Pleistocene age.

The place of the find (which occurred in August 1922) is only 500 meters distant from the point where palaeolithic implements and numerous kitchen remains were dug out,—and on the same level.

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However uncharacteristic is an isolated human front tooth, this specimen is interesting as representing one of the very few Pleistocene human remains yet known from China. Thus we are greatly indebted to Dr. Davidson Black who has kindly undertaken to study the tooth anthropologically.

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#### ON THE MORPHOLOGY AND PHYSICAL CHARACTERS OF THE TOOTH.

It is a pleasure to acknowledge my indebtedness to Pere Licent and Pere Teilhard de Chardin for their kindness in placing at my disposal for study and description this highly significant specimen, representing as it does the only skeletal part yet discovered that can be assigned with any degree of certainty to palaeolithic man in Asia. I wish also to thank them for their further courtesy in providing me with samples of *Gazella* teeth, recovered in association with the human specimen, for comparative specific gravity determinations.

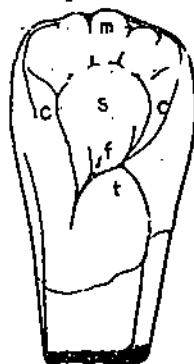
This specimen, which I shall hereafter term 'the Ordos tooth', is a well formed and perfectly preserved upper left lateral permanent human incisor with crown entirely unworn and root but partly formed. (v. Plate I.) To judge from European standards of development its ontogenetic age would thus lie between 7 and 8 years, at which time the upper lateral permanent incisors are either not yet or but partly erupted.

This stage of development is well represented in a specimen (.404-11) of the Hsin Tien Culture Stage (Early Bronze and Copper Age) from the Kansu site excavated by Dr. J. G. Andersson in 1923 and here illustrated in Plate I, figures 2a, 2b and 2c. From the Neolithic Sha Kuo T'un site several human incisors of approximately this ontogenetic age have also been recovered and three of these specimens (.157-1, .157-2, 157-4) are illustrated here in Plate I, figures 3, 4, 5a and 5b. To facilitate comparison the left upper dentition of a recent north China male (D 44) of 13 years stated age (probably less than 10 years by European method of reckoning) is shown in Plate I, figure 6. In this individual however the lateral incisors had just become functional and their roots are much further developed than is the case in the Ordos tooth. Comparative material of the greatest significance in the present enquiry is also available in the recent important publication of Dr. H.

Martin (3, see especially figs. 34, 35 and page 122) in which he describes in detail the maxillary dentition of the Mousterian child of La Quina. In this unique specimen the development of the incisor teeth had progressed to a point closely approximating the ontogenetic stage represented by the Ordos tooth. In all these specimens, whether Mousterian, Aeneolithic, Early Bronze and Copper Age or modern north China, we are dealing with well formed incisor teeth conforming in all essentials and most details to a type aptly described by Hrdlicka (*v. et.* 4, 5) as 'shovel-shaped'.

The labial surface of the Ordos tooth (*v.* Plate I, figure 1a) is marked by two ill defined, wide and shallow longitudinal grooves into three low but distinct ridges of which the median is the largest. In this respect the Ordos tooth conforms typically to the "tri-ridge and bi-groove pattern" noted by Hrdlicka (*v. 5, p. 163*) to be characteristically a feature of the labial surface of well formed human incisors.

Text figure 1. The Ordos tooth. Lingual view of upper left lateral permanent incisor. *c* crista dentalis; *f*, foveola dentis; *m*, central marginal mammelon; *s*, shovel-shaped fossa; *t*, tuberculum dentale. (*cf.* Plate I, figure 1c.) Magnification about  $\times 2.5$ .



The lingual surface (*v.* Text figure 1; Plate I, figure 1c) conforms in its general morphology to that of a typical shovel-shaped incisor as defined by Hrdlicka (*l. c.*). The incisive border is moulded by two slight notches into a small median mammelon (*m*) and two wider lateral moieties, each of the latter being further incompletely subdivided into two. Five mammelon elevations may thus be distinguished though of these the mesial and distal are but incompletely formed. The well marked shovel-shaped central fossa (*s*) is bounded laterally by the cristae dentales (*c, c*) and terminates at the base of the prominent tuberculum dentale (*t*) in the pit-like depression of the foveola dentis (*f*).

The immature root is compressed mesio-distally and marked further, on both mesial and distal surfaces, by a deep longitudinal groove. The depth and extent of these grooves may be seen on reference to Plate I,

figures 1b, 1d and 1f. The root in modern human incisor teeth is occasionally bifurcated but this condition has not been observed in any of the incisors in the collections of recent and prehistoric north China teeth at my disposal. Further, though I have seen among this material specimens in which both distal and mesial incisor root grooves occur, in none have they been so deep and sharply marked as in the Ordos tooth. On the latter specimen the distal furrow extends upward into the sulcus separating the tuberculum and the crista while the mesial furrow becomes lost upon the crown a short distance above the enamel line. (cf. Text figure 1 and Plate I, figures 1b and 1d.)

The partly formed root is stained a deep uniform blue-black around its whole apical margin, the portion between this and the enamel border being grayish buff in color. The enamel surface itself is predominantly of dull white hue irregularly tinged upon its labial surface with brown. This fact accounts for the difference in shade to be observed in Plate I between figures 1a and 1c. On the lingual surface the enamel over the tuberculum and cristae is mottled with fine irregular markings of sepia color. The enamel surface is further marked by numerous dark brown or black lines extending from its lower border upwards upon the crown parallel to the long axis of the latter. (v. et Plate I, figures 1b and 1d.) In general it may be said that the peculiar coloration and pigment markings to be observed on the Ordos tooth are similar in all essentials to those characterizing many of the teeth of other undoubtedly Pleistocene mammals recovered from this deposit. On the other hand in respect to its coloration and markings the Ordos tooth stands in marked contrast to any teeth recovered from horizons of recent date.

It is a matter of observation that fossil or subfossil specimens of similar material and age may exhibit considerable differences in the degree of their mineralization though taken from adjacent parts of the same deposit. This fact was particularly obvious in the case of the material recovered in the Sha Kuo T'un cave deposit, where some of the specimens were but slightly mineralized while others were quite extensively so (6). Nevertheless the degree of mineralization of a specimen does bear some direct relation to its age and for this reason it has been considered worth while to compare in the following summary the specific gravity of the Ordos tooth with that of similar teeth both ancient and modern.

<i>Material.</i>	<i>Specific Gravity</i>
Ordos	2.728
Sha Kuo T'un (.157-2)	2.562
Sha Kuo T'un (.157-4)	2.686
Hsin Tien (.404-11)	2.401
Recent adult (d.517)	2.500

The specific gravity of the Ordos tooth is thus definitely greater than that of any of the other specimens with which comparison has been made. This observation is in harmony with the conclusion arrived at from an examination of the coloration and markings of the tooth viz., that the Ordos specimen is unique among teeth recovered from horizons more recent than the Pleistocene. Apart from this but little if any significance can be attached to these figures though it is of interest to note the disparity between the specific weights of the two Sha Kuo T'un specimens. Further, the specific gravity of the *Gazella* tooth specimens from the Sjara-osso-gol were found to be much higher (Sp. G. 3.098) than that of the Ordos tooth, a recent *Ovis* sp. specimen having a specific gravity of 2.396.

In his extended studies on dental morphology Hrdlicka (*l. c.*) has shown that the flatness characterizing the lingual surface of the upper incisor teeth among the majority of modern European peoples is to be considered as a specialization away from the more primitive shovel-shaped condition. The latter type of incisor, though it persists with a high degree of frequency among the modern members of the yellow-brown race, occurs characteristically among primitive peoples. In the light of Hrdlicka's generalization it was thus to be expected that should unworn incisor teeth be recovered from horizons of palaeolithic or older age, such specimens would be of the shovel-shaped type, a prediction subsequently borne out by the La Quina and Ordos specimens.

The very perfection of its morphology, the character of its coloration and markings, its high specific gravity and its occurrence in association with the Pleistocene faunal remains of Sjara-osso-gol, all these circumstances together combine in furnishing sound evidence in support of the presumption that the Ordos tooth deserves its designation as the first actual skeletal part yet discovered of palaeolithic man in Asia.

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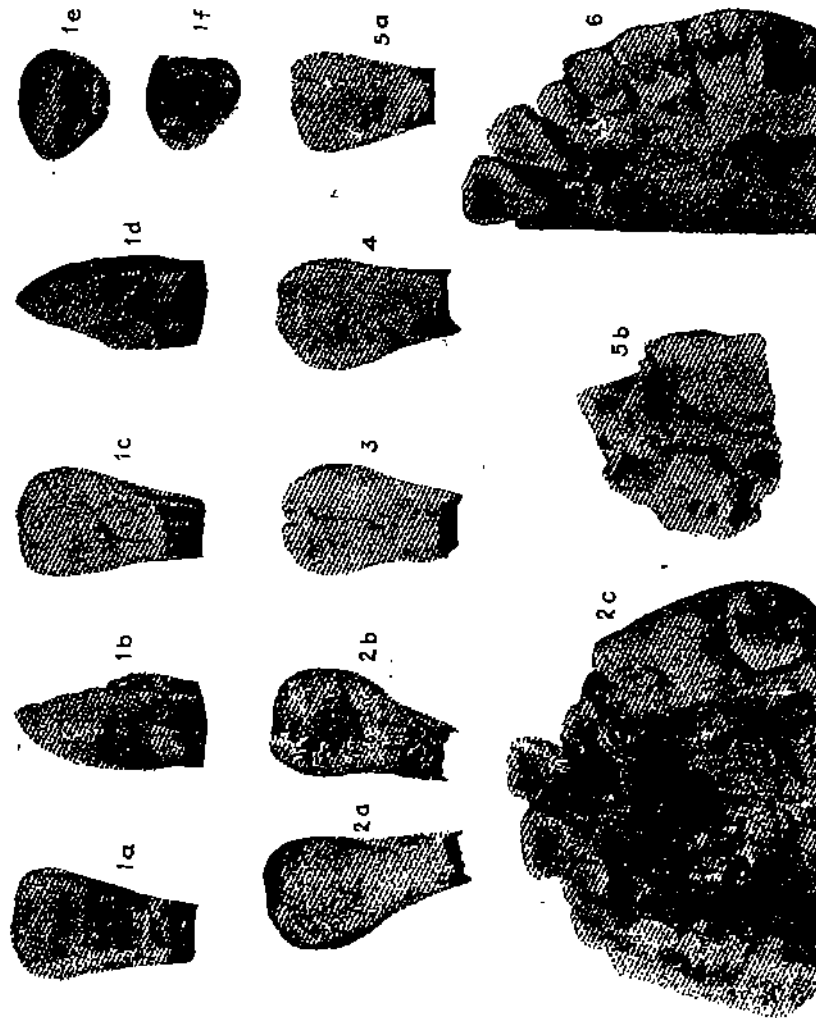


Plate I. Upper Row:—The Ordos tooth, 1a, labial view; 1b, mesial view; 1c, lingual view; 1d, distal view; 1e, occlusal view; 1f, apical view; Middle Row:—2a, and 2b, lingual view; respectively of right and left upper lateral permanent incisors of a child (J04-1) from the Hsin Tien Culture Stage of Kansu; 3, lingual view of left upper lateral permanent incisor (J05-1); 4, lingual view of right upper lateral permanent incisor (J07-2); 5a, lingual view of right upper lateral permanent incisor (J07-4). The last three specimens (figures 3, 4 and 5a) are from the Sha Kou T'un cave deposit. Lower Row:—2c, maxillary dentition of Hsin Tien specimen (J04-1); 5b, right maxillary fragment of Sha Kou T'un specimen (J07-4); 6, maxillary dentition of recent north China child (J04-1) aged about 10 yrs. Magnifications: Upper and middle rows about x 2; lower row about natural size.