A MONGOLIAN AMBLYPOD IN THE RED BEDS OF ICHANG, (HUPEH)*

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In 1934, a bone bed was located by the authors of the present note in the sandstone immediately overlying the lacustrine limestone of Yangchi, near Ichang (see Teilhard and Young, 1936, fig. 1). At the beginning of 1936 Mr. L. P. Chia of the Cenozoic Laboratory was sent to investigate more carefully the locality. And the result of his research was the unexpected find of the large part of a skull of Eudinosaurus (Eudinosaurus cf. kholobolchiensis Oeb. & Granger), a typical Upper Eocene form of Mongolia.

The double aim of this note is to give a description of the specimen, and to insist on the geological consequences of the discovery.

I. DESCRIPTION OF THE FOSSIL

Apparently the skull found by Mr. Chia was originally complete in the sediments. But it has been more than half destroyed by the water of the Yangtze. The remaining part includes the left side of the muzzle, the left orbit, a portion of the temporal fossa, and the complete zygomatic arch up to the mastoid apophysis. Two incisors (I1 and I2), sticking to a fragment of premaxillary, the canine, and a damaged upper molar (displaced from its alveolus) are preserved. To the same animal belong surely a lower P2, and probably an atlas. A lower canine was found at some distance, and represents another individual.

SKULL (s. fig. 1)

Muzzle Carnivore-like, with a strong maxillary boss, and a marked nasal boss, above the canine. Sutures of the nasal bones indistinct backward. Jugal extending as far as up to the half of the zygoma. A prominent lachrymal tubercle on margin of orbit which is rather small.

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(but not so shallow, it seems, as in *Eudinoceras kholobelchiensis*). Probably no post-orbital process on the frontal side, and surely not on the jugal side.

Fig. 1.—*Eudinoceras* cf. *kholobelchiensis* Osb. & Gr. Left side of the skull. Reduced to a fourth. The molar is displaced in the matrix from its natural place.

**TEETH** (a. fig. 2).

Two first incisors strong, spatulated (very much like the one in Osb. and Granger, 1932, fig. 4), set a distance apart from each other.

Upper canine moderately strong (female individual?), straight, square-angled, flattened antero-posteriorly (very much as in Osb. and Granger, 1932, fig. 2).

Upper molar (M3?) rather broken, but sufficiently preserved for showing the characteristic transverse crests of the crown.

Lower P2 of a typical *Corystodon* type: elongated, and with a well indicated trigonid.

Lower canine strong, square in section, too much worn for a detailed description. Possibly from a male individual.
Disformed by compression. The lateral wings are mostly broken but seem to have been rather narrow. Anterior margin tunnelled (and not notched) for the passage of the nerve. Articular surface for epistrophous broad (50 mm.) and shallow.

Maximum breadth of distal articulation surface, 150 mm.

Maximum breadth of articulation with the condyles, 140 mm.

Fig. 2.—Eudinaeeras cf. kholobolchienis. 1a, upper canine, posterior view. 1b, id. external view. 1c, id. top view. 2, and 3 first and second upper incisor, top view; the two teeth are illustrated as they are set in natural distance on the premaxillary. 4, a broken left molar (external half of crown). 5, a fragment of the same (or of another) molar. 6, lower right P2, external and top views. 7, lower left canine, internal and top views. Slightly reduced.
DIMENSIONS

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\begin{align*}
& \text{Eudinoceras} \quad \text{Eudinoceras} \\
& \text{from Yangchi} \quad \text{kholobolchiensis}^1
\end{align*}
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Length from the mastoid process (posterior margin) to the canine (anterior margin) \(\ldots\ldots\ldots\ldots\ldots\ldots 395 \quad \ldots\ldots\ldots\ldots\ldots\ldots 400\) mm.

Length between the lacrymal tubercle (posterior margin) to the canine (anterior margin) \(\ldots\ldots\ldots\ldots\ldots\ldots 160 \quad \ldots\ldots\ldots\ldots\ldots\ldots 167\)

Maximum height of the orbit \(\ldots\ldots\ldots\ldots\ldots\ldots 68 \quad \ldots\ldots\ldots\ldots\ldots\ldots 48?\)

Height of 11 and 12 (crown) \(\ldots\ldots\ldots\ldots\ldots\ldots 11 & 11\)

Length of 11 and 12 (from side to side) \(\ldots\ldots\ldots\ldots\ldots\ldots 13 & 17\)

Thickness of 11 and 12 (antero-posterior) \(\ldots\ldots\ldots\ldots\ldots\ldots 13 & 11\)

Height of lower canine (crown) \(\ldots\ldots\ldots\ldots\ldots\ldots 33\)

Length (antero-posterior) \(\ldots\ldots\ldots\ldots\ldots\ldots 17\)

Breadth (transversal) \(\ldots\ldots\ldots\ldots\ldots\ldots 22\)

Length of molar \(\ldots\ldots\ldots\ldots\ldots\ldots 25 \quad \ldots\ldots\ldots\ldots\ldots\ldots 30?\)

Length and breadth of lower P2 \(\ldots\ldots\ldots\ldots\ldots\ldots 19 & 11\)

Length and breadth of lower canine \(\ldots\ldots\ldots\ldots\ldots\ldots 23 & 19\)

COMPARISONS

By its main characters (shape of the skull, dentition, etc.) the above described specimen is most evidently an Amblypod, differing sharply from the Oligocene Hypercoryphodon (see Osb. & Granger 1932) by its short skull, humped muzzle and two-created molars, but otherwise practically identical (even in size) with Eudinoceras kholobolchiensis Osb. & Granger 1931, found by the American Expedition in the Upper Eocene of Western Gobi.

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1 The dimensions of E. kholobolchiensis are approximative, being measured on the figures given by Osborn and Granger.
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We shall therefore refer it to this latter species, although it might happen that the shape of the upper premolars when known may prove that the Yangchi form in reality belongs to another Mongolian Upper Eocene species, *E. mongoliensis* Osborn 1924 (cf. Osborn & Granger 1931), the skull of which is still unknown, or even to a new species.

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Fig. 3.—*Eudinoceras* cf. *kholbolchiensis* (?). Atlas, a, from above, and b, from below. Reduced a half.

2. GEOLOGICAL CONCLUSIONS

a) The discovery of an *Eudinoceras* near Ichang confirms definitely the Cenozoic age of the Upper Red Beds of W. Hupeh, and places them in the Upper Eocene (Irdin Manha of Mongolia). The same conclusion had been reached already for the Hsichuan beds of SW. Honan
b) In the case of Ichang, this demonstration of the Upper Eocene age of the Red Beds is evidently restricted to the horizons found above the second (or upper) conglomerate (see Teilh. and Young, 1935, fig. 1). The underlying sandstone and first (or lower) conglomerate may still be (and probably are in fact) Upper Cretaceous.

c) In case that the tooth found in the Red Beds of Changaintien near Peking really belongs to an Amblypod (see Young, 1934, fig. 4), this order of mammals would prove to have been largely distributed over China in Early Cenozoic times.

d) In any way, the fact that the two only mammals so far known in the Red Beds of Central China are both Mongolian forms indicates with some probability that, at the end of the Eocene, the Taimling were largely levelled down (by the strong erosion responsible for the deposition of their Early Tertiary conglomerates)—and that a single, probably swampy, peneplain extended itself from the Western Gobi down to the present Yangtze basin.

e) Further more, since the Ichang Upper Red Beds suggest a lake-deposit, and in addition are decidedly tilted, there is a strong presumption that the Yangtze was not yet existing as a river, under its present form at the end of Eocene, but that its modern route East of the Gorges has been opened during the Upper Cenozoic. The present drainage of the Yangtze has to be connected with a deep rejuvenation of the Eocene topography.

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