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## AMYNODON MONGOLIENSIS FROM THE UPPER EOCENE OF MONGOLIA<sup>1</sup>

BY HENRY FAIRFIELD OSBORN<sup>2</sup>

The skeleton of an amynodont rhinoceros, essentially complete except for the left fore leg, was one of the choice finds of the 1923 field season in Mongolia. It was collected in the Shara Murun Formation at Ula Usu, by A. F. Johnson, in June and September, 1923, and has been skillfully mounted by Peter Kaisen. It is clearly referable to the genus *Amyndodon*, and the closest resemblances are with *Amyndodon intermedius* Osborn from the Uinta of Utah.

### *Amyndodon mongoliensis*, new species

TYPE.—Amer. Mus. No. 20278, a laterally crushed skull and nearly complete skelton, lacking the left fore leg, of an adult.

HORIZON.—Shara Murun, Upper Eocene, Mongolia.

LOCALITY.—Ula Usu, Inner Mongolia (field No. 224).

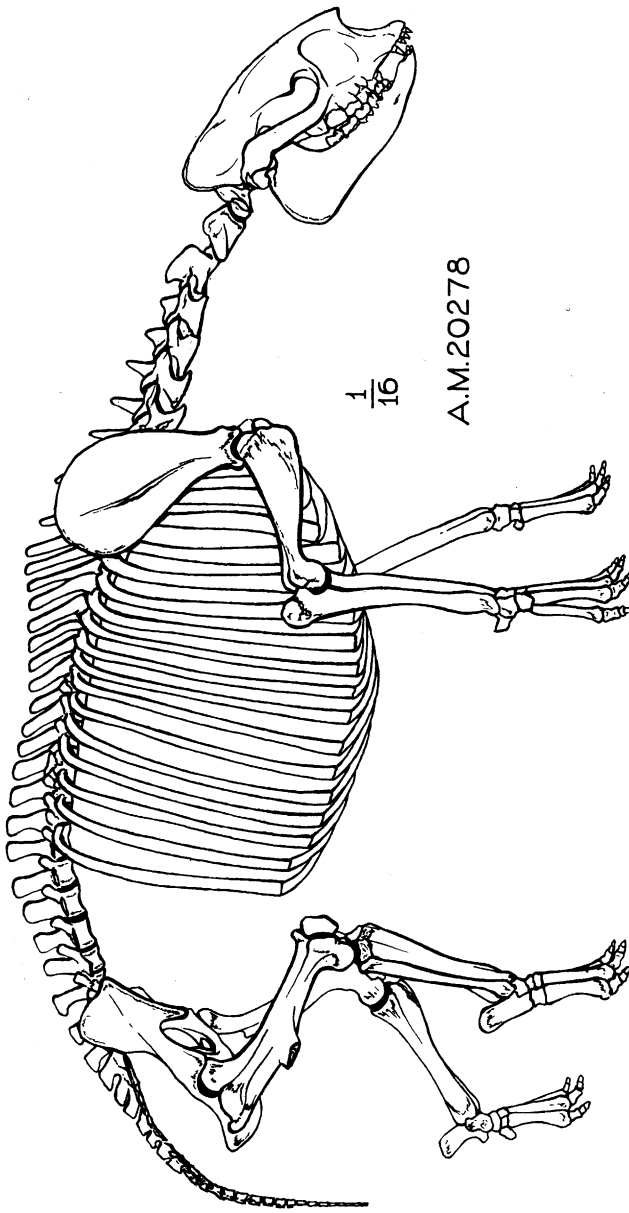
DIAGNOSIS.— $I_3^3$ ,  $C_1^1$ ,  $P_3^3$ ,  $M_3^3$ ; teeth generally suggestive of *A. intermedius*; canines not hypertrophied; stub of root of  $dP^1$ , right, still present; internal cingula complete on  $P^{2-4}$  and  $M^{2-3}$ , but interrupted by the transverse crests on  $M^1$ ; transversely elongated hypostyles on  $P^{2-3}$ , parallel to, but distinct from, the immediately adjoining posterior cingulum, forming distinct crests, nearly or quite continuous, basally, with the protoloph; traces of cement on upper molar ectoloph; external and internal cingula unusually prominent (for members of the Amyndodontidae) on all lower cheek teeth;  $P_2$  reduced in size;  $P_{3-4}$  molariform, not greatly reduced in size; lower molars rectangular and not excessively elongated;  $M_3$  not appreciably longer than  $M_2$ ; large preorbital fossa; long alisphenoid canal; prominent paroccipital process; vertebral formula: 7 cervical, 17 thoracic, 4 lumbar, 5 sacral and pseudosacral, and 22 (+ 1?) caudal vertebrae; size order of *Metamyndodon planifrons*, but proportions in general, and ratios of limb segments, in particular, as in *Amyndodon intermedius*; radius not much compressed, anteroposteriorly; digit V of manus fully functional; metacarpals and metatarsals not shortened; distal phalanges nubbins, not indicating well-shaped hooves; deep pit on dorsal surface of femur just proximal to patellar groove, presumably for origin of a large m. subcrureus; tuber calcis not flattened, dorso-ventrally.

This specimen has been mentioned briefly, without name or de-

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<sup>1</sup> Publications of the Asiatic Expeditions of The American Museum of Natural History. Contribution No. 132.

<sup>2</sup> The manuscript of this article had been completed at the time of Professor Osborn's death, November 6, 1935, and it is submitted to the editor without change except in the captions to the figures. The detailed description, comparative studies and measurements were prepared by Dr. Horace Elmer Wood, 2d, and checked and approved by Professor Osborn.—Walter Granger.



$\frac{1}{16}$

A.M.20278

Fig. 1. *Amymodon mongoliensis*, new species. Amer. Mus. No. 20278, Type. Outline of skeleton traced from a photograph of the mounted specimen. One-sixteenth natural size.



Fig. 2. Skeleton of *Amynodon mongoliensis* lying in the matrix. Shara Murun beds, Ula Usu, Inner Mongolia, September, 1923. Collectors are Olsen, Johnson, and Kan ('Buckshot'). The skull, the muzzle of which was exposed when found, has been removed.

scription, by Berkey and Morris.<sup>1</sup> It is very doubtful whether it is the form indicated by Zdansky<sup>2</sup> as "*Amynodon?* sp.," and it obviously has no close relation to the relatively tiny *Amynodon sinensis* Zdansky.

|  | <i>Amynodon</i><br><i>mongo-</i><br><i>liensis</i><br>new<br>species,<br>type,<br>A. M.<br>20278<br>mm. | <i>Amynodon</i><br><i>inter-</i><br><i>medius</i><br>Osborn,<br>type<br>upper<br>dentition,<br>P. U.<br>10309 | <i>Amynodon</i><br><i>inter-</i><br><i>medius</i><br>referred<br>lower<br>dentition,<br>A. M.<br>1963 | <i>Amynodon</i><br><i>sinensis</i><br>Zdansky,<br>type<br>upper,<br>and<br>referred<br>lower<br>dentition <sup>3</sup> |
|--|---|---|---|--|
| Right premaxillary to condyle.....                               | 549.5   |   |   |  |
| Nasal to occiput.....  | 495±  |   |   |  |
| Width across zygomata (reduced by<br>crushing).....              | 225+  |   |   |  |
| Lacrimal duct to premaxillary.....                               | 242   |   |   |  |
| Lacrimal duct to occipital condyle....                           | 340.5   |   |   |  |
| Length of right ramus of mandible....                            | 450   |   |   |  |
| Height of coronoid (average of both<br>sides).....               | 245.5   |   |   |  |
| Length of P <sup>2</sup> -M <sup>3</sup> (average of both sides) | 198.3   | 187.0   |   |  |
| Length of P <sup>2-4</sup> (average of both sides)..             | 70.3  | 62.2  |   |  |
| Length of M <sup>1-3</sup> (average of both sides)..             | 127.3   | 125.6   |   | 73.5   |
| Length of P <sub>2</sub> -M <sub>3</sub> (average of both sides) | 187.3   | 170.5   |   |  |
| Length of P <sup>2-4</sup> (average of both sides)..             | 61.9  |   | 54.3  |  |
| Length of M <sup>1-3</sup> (average of both sides)..             | 124.9   |   | 118.8   | 67   |
| Length of M <sub>1</sub> (average of both sides)...              | 35.6  |   | 33.1  | 18.5   |
| Length of M <sub>2</sub> (average of both sides)...              | 44.8  |   | 40.2  | 22.0   |
| Length of M <sub>3</sub> (average of both sides)..               | 45.8  |   | 46.1  | 24.0   |
| Height at withers.....   | about 1400  |   |   |  |
| Length of trunk.....   | about 1670  |   |   |  |

Additional specimens which are presumably referable to this species are: A. M. No. 21601, the skull and lower jaws, with large parts of the skeleton doubtfully associated, of an old individual, with worn teeth, from the gray beds in the Shara Murun, collected in 1925, four miles north of Baron Sogin Lamasary; and the following individuals, all collected at Ula Usu, in the Shara Murun, in 1923:

<sup>1</sup> 'Geology of Mongolia,' Nat. Hist. Central Asia, II, p. 362.

<sup>2</sup> 'Die altertiären Säugetiere Chinas nebst Stratigraphischen Bemerkungen.' Palaeont. Sinica, (C), VI, 2, pp. 42-50, Pls. II-III.

<sup>3</sup> Measurements from Zdansky.

- A. M. No. 20279, left ramus of mandible with  $dP_{1-4}$ ;  
A. M. No. 20282, left maxilla with  $dP^{1-4}$  and left ramus with a deciduous incisor and  $dP_{1-4}$ ;  
A. M. No. 20283, both rami, with  $P_2-M_3$ , right, and  $M_{1-2}$ , left;  
A. M. No. 20284, a face with  $dP^{2-4}$ , left, and  $dP^{3-4}$ , right.

The special resemblances of *A. mongoliensis* to *A. intermedius* should not be interpreted as due to direct migration by either species, but, rather, to parallel evolution in closely related lines.

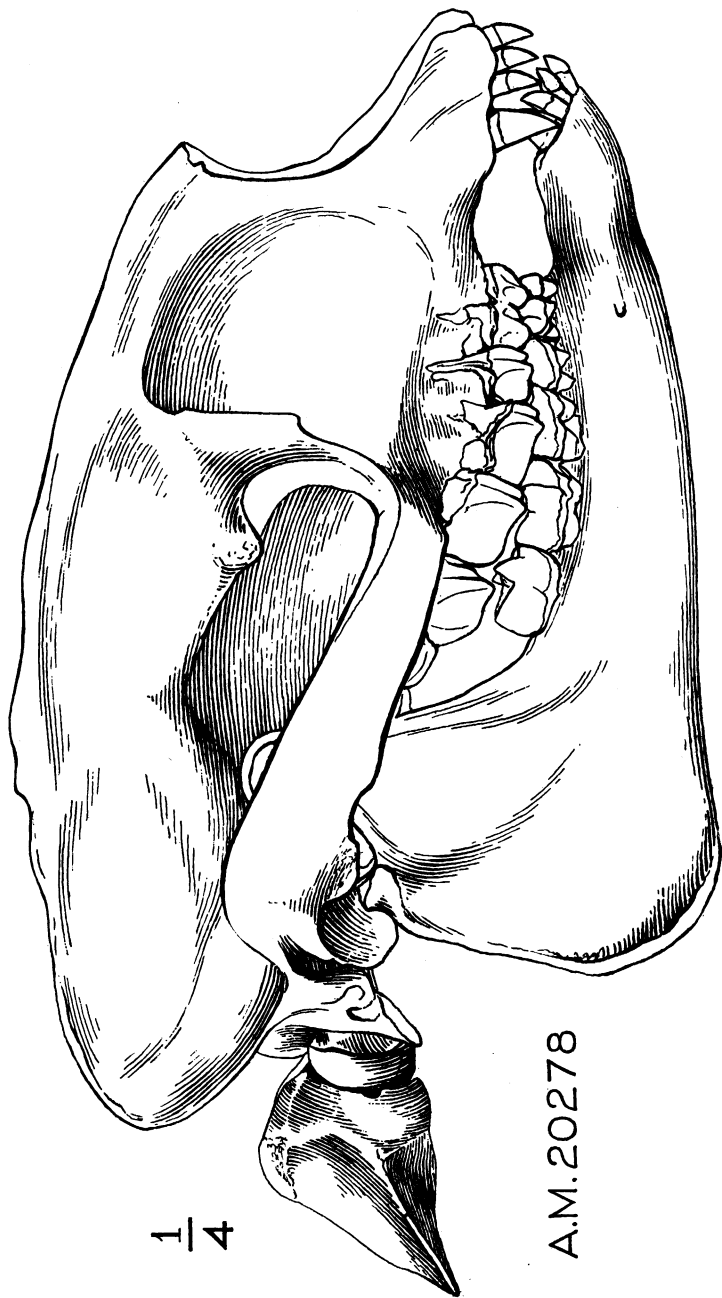
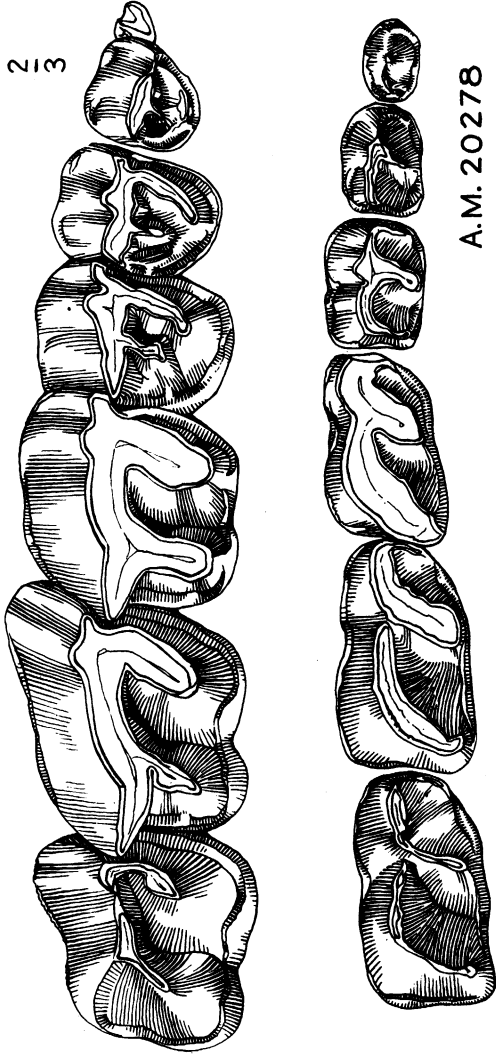


Fig. 3. *Amynodon mongoliensis*, Amer. Mus. No. 20278. Skull, mandible, and atlas vertebra. One-fourth natural size.



A.M. 20278

Fig. 4. *Amymodon mongolaensis*, Amer. Mus. No. 20278. Crown views of right upper and left lower cheek teeth. Two-thirds natural size.

$\frac{1}{2}$

A.M.  
20278



Fig. 5. *Amynodon mongoliensis*, Amer. Mus. No. 20278. Front view of right manus. One-half natural size.



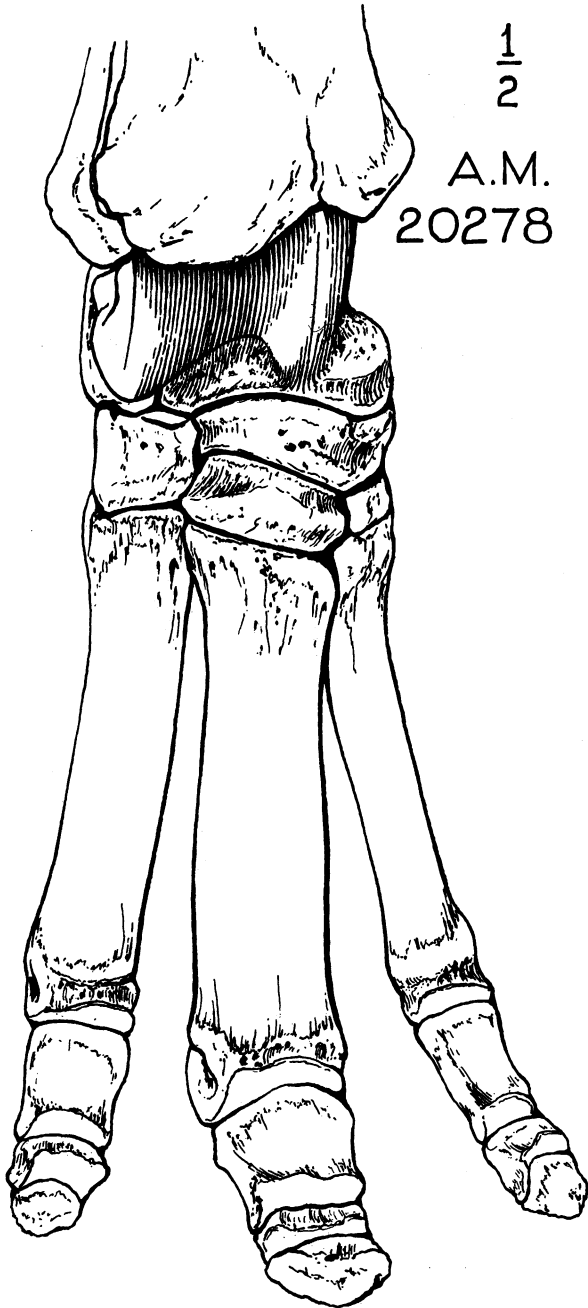


Fig. 6. *Amynodon mongoliensis*, Amer. Mus. No. 20278. Front view of right pes. One-half natural size.

