

ON A NEW FOSSIL RACE OF THE ASIATIC  
ELEPHANT IN JAPAN

BY

HIKOSHICHIRO MATSUMOTO

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*With 2 Plates*

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INTRODUCTION

The occurrence of the Asiatic elephant in a fossil state in Japan was stated for the first time by LEITH ADAMS and communicated by BUSK.<sup>1</sup> According to BUSK, a certain fossil elephant from Japan is referred to *Elephas indicus*, representing, however, a form with teeth somewhat larger than the average of the existing one. Quite recently the writer has come to be fully convinced about this first record, which appears to have been overlooked so long, and proposes here to call the Japanese form in question to the credit of BUSK, as follows.

***Elephas indieus* LINNÉ**

**Buski**, subsp. nov.

Type-specimen (Pl. XXVII (I), figs. 2, 3) (Rg. No. 7266)<sup>2</sup>:—Antepenultimate upper molar of left side; from Ninohe District, Province of Mutsu. Referred specimen (Pl. XXVII (I), fig. 1; Pl. XXVIII (II), figs. 1, 2):—Last lower molar of left side; purchased in Tôkyô. Precise locality unknown.

The type-specimen consists of eleven ridges besides the anterior and posterior talons, and measures 155 mm. in length, 60 mm. in the greatest width at the third ridge, and 154 mm. in the greatest height of crown at the seventh ridge, which was just ready to commence to wear. The middle part of the crown is peculiarly narrowed, being narrower than both anterior and posterior parts. In a palatal view, the crown is more or less bent inwards. Its frequency of ridges in a length of 100 mm. is about 8 on both the sides and about 7 on the grinding surface. The ridges are only very weakly flexuous; their inner and outer sides in a fore-and-aft view are not very markedly convex, being almost parallel at the greater middle part of the height of the ridges. The anterior and the posterior side of the moderately to strongly worn ridges at the grinding surface are nearly parallel, without any loxodont sinus. The plication of enamel of those ridges is almost uniform from end to

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<sup>1</sup>LEITH ADAMS: "Has the Asiatic Elephant Been Found in a Fossil State?" *Quart. Journ. Geol. Soc.*, London. Vol. XXIV, 1868, pp. 496-498, text-fig.; —BUSK, Additional Remarks, *id.*, pp. 498, 499.

<sup>2</sup>Gift of Mr. WAICHI KOKUBUN to the Institute of Geology and Palæontology, Tôhoku Imperial University.

end, and is very fine, regular, and strong, as a very distinctive characteristic of the present species. The figure of enamel seen in the rather slightly worn ridges is mesially laminar and laterally annular. The worn surface of the sixth ridge, which is very slightly worn, consists of five mammillæ arranged in a transverse row. The layer of enamel is considerably thin, measuring about 1-1.5 mm. in thickness on the anterior and the posterior side of the ridges.

The cement is partly and irregularly weathered. Both the cement and the dentine are provided with superficial cracks, as is commonly the case in the molars of the present form. The fossilization is extremely feeble, the material being a little sticky to the tongue. The colour is dark grayish brown. The matrix is sand.

The second specimen represents the greater anterior part of a molar, and consists of the anterior talon and fourteen ridges in the present state of preservation. Its greatest width is 75 mm. at the fourth to sixth ridges, and the greatest vertical height of its crown is about 158 mm. at the third ridge, which has just commenced to wear. The ridges are widely spaced from each other toward their bases but are closely set distally; the frequency of ridges in 100 mm. is 5 and 5.5 in minimal value at certain proximal parts of the inner and outer sides, respectively. The ridges are strongly flexuous, and their inner and outer sides are considerably convex in a fore-and-aft view; they are thickest antero-posteriorly at a certain lower middle part of their height; their thickness is considerable, quite as noticed by BUSK. The characteristic features of the ridges at the grinding surface is examined in this specimen in an artificial section. The anterior and posterior sides of the ridges at the section are not strictly parallel, the disk of ridges showing a tendency of a mesial expansion, though not like a sort of loxodont sinus; they are considerably undulating, showing the very characteristic, fine, regular and strong plication of the layer of enamel. The layer of enamel is rather thick, measuring about 1.5-2.5 mm. at the anterior and the posterior sides of the ridges.

The cement is slightly weathered at places. All the cement, enamel, and dentine are provided with cracks. It is extremely feebly fossilized and is pale to grayish yellow in colour.

Another specimen from Yedobashi, Tôkyô, which belongs to the Geological Institute of Tôkyô Imperial University, was once recorded and excellently illustrated by NAUMANN.<sup>1</sup> Still another specimen, representing a last lower molar of the right side, from the Prefecture of Wakayama, is preserved in the Museum of Education at Ochanomizu, Tôkyô. This molar is very similar in general appearance to the second specimen above described. It is slightly worn in the extent of the anterior talon to the fourth ridge. Its greatest width measures 73 mm. at the third ridge, and the greatest height of the crown 168 mm. at the fourth ridge. Its matrix is soil, probably loam.

Known localities of the present form: The remains of the present form are known from the following localities:

Over forty miles from the sea-shore between Kanagawa and Tôkyô (LEITH ADAMS); Yedobashi, Tôkyô (NAUMANN); Province of Mino (TOKUNAGA); Sapporo, Province of Ishikari, Hokkaidô (TOKUNAGA); Ninohe District, Province of Mutsu; Prefecture of Wakayama.

AGE: Judging from the exceedingly feeble fossilization of the remains, as far as examined by the writer, the present form may probably belong to a very late geological age, such as the Post-Monastirian. The occurrence of the present form may indicate a warmer climate, that being well in accord with certain geological evidence already known.

<sup>1</sup> NAUMANN: "Ueber Japanische Elephanten der Vorzeit." *Palæontogr.*, Bd. XXVIII, 1882, p. 31, Pl. VII.

PLATE XXVII (I)

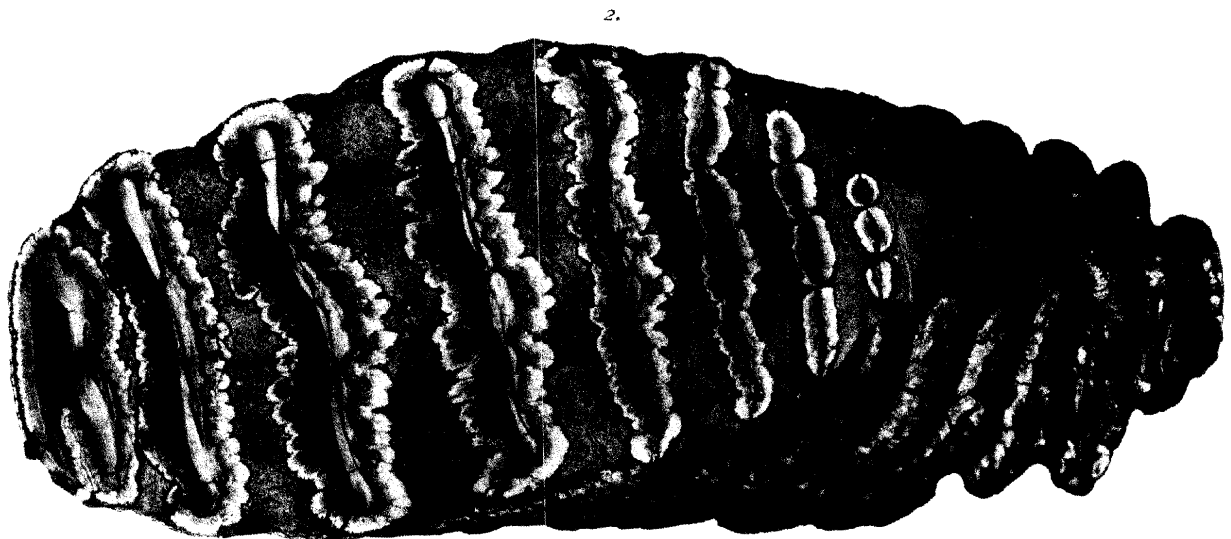
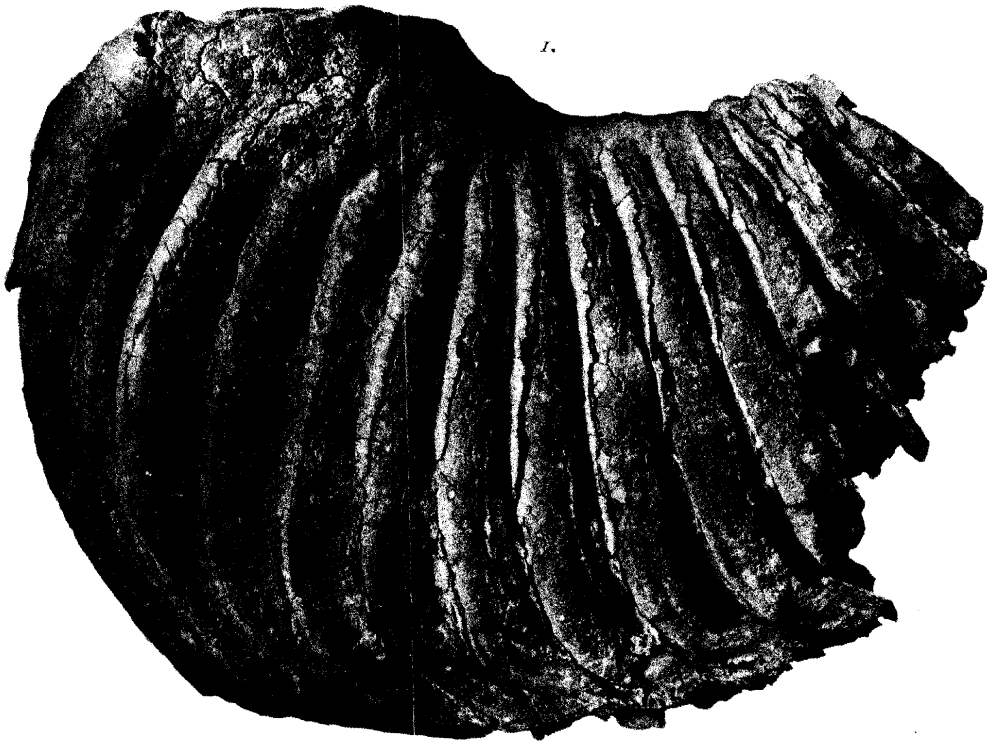
- Fig. 1. *Elephas indicus Buski*; left  $M_{\bar{7}}$  (referred specimen). Upper view.  $\times \frac{2}{3}$
- Fig. 2. *Elephas indicus Buski*; left  $M^L$  (type-specimen). Inner view.  $\times \frac{2}{3}$
- Fig. 3. Ditto, palatal view. Nat. size.



PLATE XXVIII (II)

Fig. 1. *Elephas indicus* Buski; left  $M_3$  (referred specimen). Outer view.  $\times \frac{2}{3}$

Fig. 2. Ditto, crown view of an artificial section. Nat. size.



*Ebina phoio*