

**DESCRIPTION OF THE PLATES
OF THE FAUNA ANTIQUA
SIVALENSIS, FROM NOTES
AND MEMORANDA**

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Description of the Plates of the Fauna Antiqua Sivalensis, from Notes and Memoranda by
Hugh Falconer

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FAUNA ANTIQUA SIVALENSIS.

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DESCRIPTION OF THE PLATES
OF THE
FAUNA ANTIQUA SIVALENSIS

FROM NOTES AND MEMORANDA

BY

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DESCRIPTION OF THE PLATES

IN

THE FAUNA ANTIQUA SIVALENSIS.



[This description has been mainly compiled from the following sources:—1. Memoranda in Dr. Falconer's note-books and papers; 2. References to certain of the figures in his published memoirs on Elephant, Mastodon, &c.; 3. References to other figures in his correspondence with scientific friends; and 4. Labels in his handwriting on the specimens figured which are now in the British Museum. Although the figures are drawn to scale, the actual measurements have, as far as practicable, been introduced into the description of each figure. It has been thought that by their means, the value of the descriptions would be increased to those who have not an opportunity of consulting the Plates, and that even to those who possess the Plates the comparison of specimens would be facilitated. The measurements are given in English inches, and in tenths of an inch. The letters B.M. indicate that the specimen referred to is in the British Museum.]

Plates I., II., and III. are intended to represent, by careful copies of nature, the modifications in structure and form exhibited by the molar teeth of the *Proboscidea*. They show in vertical sections a series of gradations, commencing with *Dinotherium* and *Mastodon Ohioticus* at one extremity, and running through the other species to *Elephas primigenius*, in which the greatest deviation from the ordinary form of a grinding tooth is met with.

PLATE I.

Fig. 1.—*Elephas primigenius*, or the true Mammoth: longitudinal and vertical section of last upper molar, left side, from an English specimen found near Kingalund, and formerly in the Museum of the Geological Society. Shows the 'ridge formula' and the form and relative proportions of the alternate layers of ivory. The section closely resembles that of the corresponding tooth of the Indian Elephant, but the ivory segments are even thinner, more vertical, and more approximated. The disposition of the plates presents the

extreme degree of 'pectination' seen in the molars of any known species of elephant.—B.M.

Length, 11 in. No. of plates, 21. Depth of enamel at tenth plate, 6.2 in. Length of space to 10 plates, 4½ in.

Fig. 2 a.—*Elephas Indicus*. Vertical section of an upper penultimate molar of the existing Indian Elephant. It is composed of seventeen ridges, with a reduced talon splent behind, the anterior talon being confluent with the first ridge. The anterior eight plates are inclined forwards, and by the process of wear they are ground down, so that the front part of the tooth is truncated obliquely before the posterior lamellæ have come into use. The plates are very thin and vertical, and the enamel is thin. The gradual attenuation of the plates, successively exhibited from *E. insignis* to *E. Hydricus*, is here carried to excess, eighteen being comprised within the space occupied by about nine in the equivalent tooth of the African species. The pectinated arrangement contrasts strangely with the chevron-formed ridges of *E. insignis* and the cuneiform plates of *E. planifrons*. The mass of ivory at the base of the tooth is much thinner than in the corresponding molar of *E. Hydricus*.

Length of crown, 8.2 in. Space occupied by 10 plates, 4½ in. Height at tenth plate, 6 in.

Fig. 2 b.—*Elephas Indicus*. Vertical section of unusually large specimen of last lower molar of an Indian Elephant from Assam, in India House collection. The entire length of the crown is about fifteen inches, and it includes as many as twenty-seven ridges, of which the anterior thirteen are more or less abraded. The first five or six ridges incline a little forwards, while the posterior ridges incline so much in an opposite direction, that the hindermost are nearly horizontal, producing the flabelliform character that so readily distinguishes in most instances the last from the penultimate lower molar. The same disposition and proportions of the dental substances are observed as in the upper grinder.

Fig. 3 a.—*Elephas Hydricus*, from the Sewalik hills. Vertical section of penultimate upper molar, left side. The tooth is in the middle stage of wear, eleven of the thirteen plates of which it is composed having been in use, and the two anterior ridges being worn out. The same vertical disposition of ivory, enamel, and cement is presented as in the African Elephant, but the plates are thinner and more vertical; the layer of enamel is proportionally thicker; and the interspaces occupied by the cement are wider in general than the ivory plates.—B.M.

Length, 7.7 in. Length of 10 plates, 5.75 in.

Fig. 3 b.—*Elephas Hydricus*. Vertical section of portion of last molar of lower jaw, comprising about fifteen plates. The same general character, in the disposition and relative proportion of the ivory, enamel, and cement are exhibited as in the upper molar, bearing in mind that the latter is a younger and consequently smaller tooth. The layer of enamel, however, is thinner than in the upper molar. The ivory segments curve back near their base, and the apices of the posterior plates lean towards the front of the tooth, a disposition still more marked in the existing Indian Elephant. The dark shade below the ivory indicates a core of sandstone, occupying the place of the unossified part of the pulp nucleus, and of the undeveloped fangs.—B.M.

PLATE II.

Fig. 4 a.—*Elephas Africanus*. Vertical section of a penultimate grinder, upper jaw, of the existing African Elephant, in the possession of Mr. C. Stokes. It is composed of nine principal divisions and a subordinate talon ridge, the four anterior of which are partly worn, the rest being entire. The ivory segments consist of long narrow wedge-shaped plates, the height of which is many times greater than the width of their base. The interspaces are deep and filled up with copious cement. The enamel and common basal mass of ivory are much less than in either *E. insignis* or *E. planifrons*, the latter being only sufficient to establish a common connection between the bases of the segments, and a foundation for the offset of the fangs, which are numerous.

Length, 8·7 in.

Fig. 4 b.—*Elephas Africanus*. Vertical section of penultimate molar of lower jaw, belonging to Mr. C. Stokes. It is composed of nine cuneiform plates. This tooth had been a long time in use, all the plates, except the last being affected by wear. The anterior part of the crown has been ground down to nearly one-third of its original height, so that the enamel divisions between the two anterior ivory plates have disappeared, and the latter are confluent into a common mass. The section exhibits the same kind of wedge-shaped ivory plates, a similar amount of cement in the interspaces, and an analogous thickness of enamel as in *E. planifrons*, fig. 5 b.

Length, 7·2 in.

Fig. 5 a.—*Elephas planifrons*, from the Sewalik hills. Vertical section of penultimate upper molar, with nine ridges, the three anterior of which alone have been in use, the two first being worn down to a single disc of ivory. The ridges are seen to be much more elongated vertically than in *E. insignis* (fig. 6 a), but to be considerably less so than in the African Elephant. From the latter it also differs in the enormous quantity of cement, filling up the valleys and enveloping the ridges, and in the much greater thickness of the folded plates of enamel. The enamel is reflected over the ridges of ivory, and down into the hollows zig-zag wise, exactly as in *E. insignis*.—B.M.

Length, 8·7 in.

Fig. 5 b.—*Elephas planifrons*. Vertical section of portion of last molar of lower jaw, with nine ridges, and presenting the same general characters as fig. 5 a. The lower tooth, however, had been longer in use, and all the ridges are more or less worn, except the two last.—B.M.

Fig. 6 a.—*Elephas insignis*, from the Sewalik hills. Vertical section of last upper molar. The four anterior ridges are affected by wear; the six posterior ridges are entire, the fangs are fully developed, and their mode of implantation in the jaw is distinctly shown. The white mass in the centre represents the body of ivory, which is projected upwards in ten angular lobes, terminating in a sharp edge. The height of these lobes does not much exceed the width of their base, and closely applied over them is a thick layer of enamel reflected up and down in a continuous zig-zag plate. The interspaces of the five posterior ridges of enamel are completely filled up by a mass of cement much exceeding the enamel in thickness (*vide* Plate VI. fig. 7). This is the best illustra-

tion of the intermediate type of a proboscidean molar tooth, from which those of the other species diverge in opposite directions. It belongs to the *Mastodon Elephantoides* of Clift. The dark granulated shade below the portion of the ivory nucleus sustaining the five posterior ridges indicates the hollow of their common fang, which in the fossil is occupied by a core of sandstone.—B.M.

Length of tooth, 10·3 in.

Fig. 6 b.—*Elephas insignis*. Vertical section of anterior portion of adult tooth of lower jaw. The two front ridges only have been touched by wear. The ivory, enamel, and cement present the same characters as in the upper molar, but the common curve of the crown is slightly concave instead of convex. The posterior part of the basal portion of the pulp nucleus has not completed the stage of calcification, its place being occupied by a nest of calcareous crystals. The figure also shows two ridges of the preceding molar, with their common fang implanted in the lower jaw.—B.M.

PLATE III.

Fig. 7 a.—*Elephas Ganesa*, a fossil Indian species. Vertical section of last upper molar. The crown consists of ten principal ridges, with a subordinate talon ridge in front and behind. The anterior seven ridges have their summits worn. A small portion is broken off at the anterior end. The disposition and relative proportions of the ivory, enamel, and cement bear the closest resemblance to those of the corresponding tooth of *E. insignis*, and the number of ridges agrees. In fact, there are no good characters by which the teeth of these two species can be satisfactorily distinguished, although the crania are so remarkably different.—B.M.

Length of tooth, 9·25 in.

Fig. 7 b.—*Elephas Ganesa*. Vertical section of posterior molar of lower jaw. A small portion of the anterior end of the crown has been broken off, but the presence of the anterior fang proves that the section includes the whole length of the tooth, except the first ridge, the posterior end being entire. It appears to have consisted of eight principal ridges, with a talon ridge behind, and a subordinate ridge in front. Five of the ridges have been in use, the anterior two being worn down close to the common base of ivory; the three last ridges are entire. It bears a close resemblance to the corresponding inferior tooth of *E. insignis* in the form of the ridges, thickness of enamel, and proportion of cement.—B.M.

Fig. 8.—*Mastodon latidens* (Clift). Vertical section of two last molars of upper jaw. The specimen of which the section was made was formerly in the collection of the Geological Society, and is figured in Clift's memoir (Plate XXXVII. fig. 1). The last tooth shows five principal ridges with a posterior talon ridge and a subordinate ridge in front. The ridges are transverse and divided by a longitudinal cleft into two pairs of principal points without intermediate mammillæ in the hollows. The enamel is very thick and the cement is reduced to a thin layer, only observable in the bottom of the hollows. The ivory lobes resemble those of *E. Ganesa*, but are less elevated, with a broader base. The anterior tooth had been a long time in use, and the ridges are nearly all