

MINISTERIE VAN ONDERWIJS, KUNSTEN EN WETENSCHAPPEN

ZOOLOGISCHE MEDEDELINGEN

UITGEGEVEN DOOR HET

RIJKSMUSEUM VAN NATUURLIJKE HISTORIE TE LEIDEN

DEEL XXXII, No. 11

14 October 1953

PLEISTOCENE VERTEBRATES FROM CELEBES. VI. STEGODON SPEC.

by

Dr. D. A. HOOIJER

(Rijksmuseum van Natuurlijke Historie, Leiden)

(with Plate V)

The fossil remains described in the present contribution as well as in previous numbers of this series (Hooijer, 1948a-c, 1949, 1953) were collected some years ago by Mr. H. R. van Heekeren at various localities in the Tjabengè area, Sopeng district, about 100 km Northeast of Macassar in South-western Celebes. I owe the opportunity to study this material to Prof. Dr. A. J. Bernet Kempers, Head of the Dinas Purbakala R.I. at Djakarta, Java.

The elements to the Tjabengè fauna described thus far from Mr. Van Heekeren's collection are a giant tortoise, a babirusa, an aberrant extinct suid (*Celebochoerus*), an anoa, and a pygmy elephantine, the molars of which are just a 50 per cent scale reduction of their homologues in *Archidiskodon planifrons* (Falconer et Cautley). While at first it seemed that the Pleistocene fauna of Celebes was not any richer than indicated above, subsequent consignments made it increasingly evident to me that the pygmy archidiskodont, *Archidiskodon celebensis* Hooijer (1949, 1953), was not the only proboscidean in the Tjabengè fauna. Among the many specimens of *Archidiskodon*, mostly very fragmentary, there are a number of molar fragments of a more primitive type, stegodontine rather than elephantine in characters. *Stegodon* is well represented in the Pleistocene of Southeast Asia; it occurs in the Siwaliks of India, and in Burma, Indo-China, China, Japan, Formosa, the Philippines, and Java. The material to be described below indicates that stegodonts have also reached the island of Celebes. Although the nature of the material does not permit of more than a generic determination it seems

advisable to make the evidence available since it is improbable that additional material can be obtained under the present conditions.

Stegodon spec.

The anterior portion of a left lower molar (pl. V figs. 1-2) originates from Sompoh, near Tjabengè, and is somewhat weathered. The specimen is broken off behind the fifth ridge from the front. The ridges are not much worn, and the occlusal surface is slightly concave anteroposteriorly; it falls off distinctly toward the buccal surface which is concave. The lingual surface is convex, and on this surface the edges of the ridges are much damaged.

In front of the anterior ridge, which is damaged buccally too, there is a small cone placed just buccally of the median line of the crown; otherwise there is no anterior talonid. The ridges increase somewhat in height passing from front to back but remain much lower than wide. Each ridge bears a buccal and a lingual conule, with three to five smaller conules in between, and this central portion of the ridge is marked off from the marginal conules by vertical grooves in the enamel. Even in the foremost ridge these conules are not yet worn out, and in the last preserved ridge, some of the central conules of which are broken off, there is hardly any wear. The transverse valleys of the crown are filled with weathered cement that does not show on the buccal and lingual surfaces although it may have been present there, too.

Of the root system only a stump of the anterior root remains, situated below the two ridges in front, while part of the wall of the main root, especially on the lingual side, is also preserved.

There is another fragment of a molar with only two ridges from the same locality (Sompoh) that in all respects is so very similar to the foregoing specimen as to make it highly probable that it formed part of the same molar (pl. V figs. 3-4). Both ridges are damaged below, and one of them is incomplete apically, but the other is intact above and unworn. It shows two marginal and three central conules, with vertical enamel grooves in between, as in the first described molar, and weathered cement in the valleys. The greatest width of the two Sompoh specimens is the same, viz., 60 mm, and the height of the almost unworn last ridge of the larger fragment is the same as that of the unworn ridge of the smaller fragment, 40 mm.

The comparison of the present specimens with the molars of *Archidiskodon celebensis* (Hooijer, 1949, 1953) reveals various points of difference;

the ridges are wider than those in the last molars of *A. celebensis*, and added to that they are lower and more widely spaced.

In the present specimens the width amounts to 60 mm, while the upper and lower last molars of *A. celebensis* do not exceed 47 mm in width. In the present specimens the ridges are only two-thirds as high as wide, while in *A. celebensis* the plates of the last molars are slightly higher than wide. In the larger Sompoh fragment plates 2 to 5 inclusive, with the valley in front of each plate, occupy an anteroposterior length of 68 mm, giving a laminar frequency of 6; in *A. celebensis* even the last molars have a laminar frequency of $7\frac{1}{2}$ -8.

In addition there are two distinctive characters in which the present specimens differ from *Archidiskodon* and which prove them to belong to *Stegodon*. As can be seen on the lingual as well as on the buccal surface the ridges are in contact for some distance above the bottom of the valley, which thus appears to be pinched together at the base, the enamel forming a Y in cross section. This is characteristic of *Stegodon* as stated, e.g., by Matsumoto (1918, p. 54) and Hopwood (1935a, p. 49); it also appears from the sections figured by Osborn (1942, p. 867 fig. 747, p. 881 fig. 764). In the elephantines (including *Archidiskodon*) the plates part immediately at the bottom of the intermediate valley, and consequently the enamel forms a V in cross section. Finally, the enamel of the present specimens, as shown in broken edges at various parts of the crown, consists of two layers that differ slightly in structure. This feature has been described by Janensch (1911, p. 162) as typical of Javanese stegodonts and has not been observed in the elephantines.

A very characteristic specimen that remains to be described is from Tjeleko, a locality on the Walanae river 8 km North of Sompoh, Tjabengè, and consists of the hinder portion of a right upper molar with all the ridges worn (pl. V fig. 5). The molar is broken off anteriorly through the middle of the sixth ridge from behind. The crown narrows gradually from front to back and terminates rather abruptly behind the last ridge which has just been touched by wear. There is much cement on the buccal as well as on the lingual surface of the crown; the cement coating, however, is lost on most of the posterior surface. The wearing surface is slightly convex anteroposteriorly.

The hindmost ridge consists of two transversely elongated central conules flanked by smaller marginal conules; only the buccal of the central conules is worn to a slight extent. The second ridge from behind already presents six annular enamel figures from side to side, the median of which are the largest. The anterior three and a half ridges are worn down to single enamel

figures, most expanded in the centre and with wrinkled borders. The degree of wrinkling appears to increase toward the bases of the ridges, as it is most pronounced in the foremost ridges. From back to front there also is an ever increasing zone of contact between the enamel figures of the plates along the intermediate valleys which are very narrow in the middle but wide open toward the buccal surface. On the lingual side of the crown there are marginal tubercles that block the entrances to the valleys (see pl. V fig. 5).

As far as can be ascertained from this worn molar the ridges have been very low, and furthermore the configuration of the enamel figures with their wrinkled borders and the presence of marginal tubercles in the entrances to the valleys stamp the present specimen as a typical *Stegodon* molar. The bottom has not yet been reached by wear even in the foremost preserved valley, while the enamel borders of the ridges have established a broad zone of contact already in the valley between the fourth and third ridges from the front, which tends to show that the transverse valleys are pinched together near the base, another feature characteristic of *Stegodon*.

The root of the present specimen is for the greater part broken off. The greatest width of the crown (at the fifth ridge from behind) is 63 mm; at the penultimate ridge the crown is still 55 mm wide, inclusive of cement. Ridges 2 to 4 inclusive from the front occupy an anteroposterior space of 45 mm, giving a laminar frequency of $6\frac{2}{3}$. Thus, like the above described Sompoh molars, the Tjeleko specimen differs from the last molars of *Archidiskodon celebensis* in the ridges being wider and more widely spaced, and the valleys being Y-shaped instead of V-shaped in cross section.

The length of the molars to which the above described fragments have belonged cannot be determined, of course. In width the present fragments agree with the M1 of *Stegodon trigonocephalus* Martin from the Pleistocene of Java (Janensch, 1911, p. 168; Van der Maarel, 1932, table U) and with the DM4 of *Stegodon orientalis* Owen from the Pleistocene of China (Colbert and Hooijer, 1953, p. 73). Do our Celebes specimens represent intermediate molars? In my opinion there is much to be said contrary to this view. Firstly the above described molars would seem to have possessed more than the six or seven ridges present in the intermediate molars of *Stegodon trigonocephalus* or *Stegodon orientalis*. A careful comparison with actual specimens from Java and China and with published figures leads one to suppose that the large Sompoh and Tjeleko fragments represent about one-half of the complete molar, which would bring the number of ridges up to about ten, the number of ridges shown in the last molars of

the Javanese and Chinese *Stegodon*. Secondly, the above described molars from Sompoh and Tjeleko are the largest that occur in the Celebes collection. There are more fragments of *Stegodon* molars in Mr. Van Heekeren's collection, unfortunately all very much less complete than those already recorded, and, while none of them is larger, some fragments point to molars that are decidedly smaller than the above mentioned specimens.

Consequently, it seems rather probable that the fragments figured in the present paper represent the largest molars of the Celebes form of *Stegodon*. Last molars usually are better represented in collections than are the intermediate and anterior milk molars anyway, because of their belonging to the adult dentition and because they are more easily found.

If the above described fragments represent last molars, the Celebes *Stegodon* would be a pygmy compared to the Javanese and Chinese species of this genus, in which the M₃ are about one-half wider than the molars from Celebes.

A pygmy *Stegodon* would be a novelty since no dwarfed stegodonts have been described thus far. The *Stegodon* molars from the Pleistocene of Formosa are of the same size as, and have been referred to, *Stegodon sinensis* Owen, *Stegodon insignis* Falconer et Cautley, and *Stegodon orientalis* Owen (Hayasaka, 1942, p. 97), and Beyer (1949, pl. 1 fig. 1) figures a fragment of a *Stegodon* molar from the Pleistocene of Rizal province, Luzon, Philippines, that is at least 70 mm wide and thereby larger than the Celebes specimens also.

Further comparisons are difficult on the base of the present material especially since the number of conelets on the ridges varies considerably within the species and consequently is of very little systematic value (Hopwood, 1935b, p. 82). If our surmise that the Celebes *Stegodon* represents a pygmy within the group of *Stegodon* species is correct we would have a most interesting parallel to the case of *Archidiskodon celebensis*, another pygmy proboscidean that lived at the same place and time. This, after all, would certainly be less surprising than the find of a normal-sized *Stegodon* besides our pygmy *Archidiskodon*.

When I first described *Archidiskodon celebensis* (Hooijer, 1949) I inferred from the size of the associated adult limb bones more than from anything else that the archidiskodont was a dwarfed species. This interpretation was later fully substantiated by the description of the fine complete last lower molar in situ in the mandible (Hooijer, 1953). In all the material I have seen from Celebes since my first descriptions of 1948 there is no evidence of fossil proboscideans of any larger size.

The fact remains, however, that *Stegodon* is very much less well rep-

resented in the Celebes collection than is *Archidiskodon*, and there is a possibility that larger *Stegodon* molars still await discovery. Therefore, hoping that some day we shall be able to decide whether or not the Celebes *Stegodon* represents a new species, it seems preferable to put the specimens on record as *Stegodon* spec.

REFERENCES

- BEYER, H. O., 1949. Outline review of Philippine archaeology by islands and provinces. The Philippine Journ. Sci., vol. 77, pp. 205-374, 22 pls., 2 figs.
- COLBERT, E. H., and D. A. HOOIJER, 1953. Pleistocene mammals from the limestone fissures of Szechwan, China. Bull. Amer. Mus. Nat. Hist., vol. 102, pp. 1-134, pls. 1-40, 42 figs.
- HAYASAKA, I., 1942. On the occurrence of mammalian remains in Taiwan: a preliminary summary. Taiwan Tigaku Kizi, vol. 13, pp. 95-109, pls. V-VII.
- HOOIJER, D. A., 1948a-c. Pleistocene Vertebrates from Celebes. I. *Celebochoerus heekereni* nov. gen. nov. spec.; II. *Testudo margae* nov. spec.; III. *Anoa depressicornis* (Smith) subsp., and *Babyrousa babyrussa beruensis* nov. subsp. Proc. Kon. Ned. Akad. v. Wet. Amsterdam, vol. 51, pp. 1024-1032, 1 pl., 1 fig. (1948a); pp. 1169-1182, 1 pl. (1948b); pp. 1322-1330, 1 pl. (1948c).
- , 1949. Pleistocene Vertebrates from Celebes. IV. *Archidiskodon celebensis* nov. spec. Zool. Med. Museum Leiden, vol. 30, pp. 205-226, pls. VIII-IX.
- , 1953. Pleistocene Vertebrates from Celebes. V. Lower molars of *Archidiskodon celebensis* Hooijer. Ibid., vol. 31, pp. 311-318, pl. XIX.
- HOPWOOD, A. T., 1935a. Fossil elephants and man. Proc. Geol. Assoc., vol. 46, pp. 46-60.
- , 1935b. Fossil Proboscidea from China. Pal. Sinica, ser. C, vol. 9, fasc. 3, pp. 1-108, 8 pls.
- JANENSCH, W., 1911. Die Proboscidiier-Schädel der Trinil-Expeditions-Sammlung, in: Selenka, M. L., and H. Blanckenhorn, Die Pithecanthropus-Schichten auf Java, Leipzig, pp. 151-195, pls. XXI-XXV, 17 figs.
- MAAREL, F. H. VAN DER, 1932. Contribution to the knowledge of the fossil mammalian fauna of Java. Wet. Med. Dienst Mijnbouw Ned. Indië, no. 15, 208 pp., 20 pls., 29 figs.
- MATSUMOTO, H., 1918. On a new archetypal fossil elephant from Mt. Tomuro, Kaga. Sci. Rep. Tōhoku Imp. Univ., ser. 2, vol. 3, pp. 51-60, pl. XX, 3 figs.
- OSBORN, H. F., 1942. Proboscidea. A monograph of the discovery, evolution, migration and extinction of the mastodonts and elephants of the world. Vol. 2, *Stegodontoides*, *Elephantoidea*. New York, pp. 805-1675, 1-XXVII, pls. XIII-XXX, figs. 681-1224.

EXPLANATION OF PLATE V

Figs. 1-5, *Stegodon* spec.; figs. 1-2, anterior portion of left lower molar, Sompoh, S.W. Celebes; fig. 1, crown view; fig. 2, buccal view; figs. 3-4, fragment of molar, Sompoh, S.W. Celebes; fig. 3, crown view; fig. 4, posterior view; fig. 5, posterior portion of right upper molar, Tjeleko, S.W. Celebes, crown view.

All figures natural size.

