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ON AN EXTINCT SPECIES OF THE GENUS VARANUS (REPTILIA, SAURIA) FROM THE ISLAND OF FLORES

by

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with text-figs. 1—3, and plates IV—VIII

An interesting collection of subfossil animal remains from cave deposits in the island of Flores (Lesser Sunda Islands) was brought together by Dr. Th. L. Verhoeven. The collection includes numerous remains of mammals (Hooijer, 1957; Hooijer, in Verhoeven, 1958, pp. 262-263), as well as some vertebrae of snakes, and fragments of the skull of a *Varanus* species. The deposits also contain evidence of a mesolithic flake and blade industry (Verhoeven, 1952, 1953; Van Heekeren, 1957, p. 107); their age is holocene (Hooijer, 1957, p. 299: "definitely post-Pleistocene").

The *Varanus* remains are described in the present paper; they belong to a new species, which I dedicate to Dr. D. A. Hooijer in appreciation of his outstanding contributions to the knowledge of the extinct faunas of S. E. Asia.

The subfossil remains have been compared to skulls of various species of *Varanus* in the collections of the Rijksmuseum van Natuurlijke Historie, Leiden. As the description will show they differ widely from the recent species occurring in the island of Flores (*Varanus* (*V.*) *salvator* (Laur.), *V.* (*V.*) *komodoensis* Ouwens), as well as from all other species known from S. E. Asia. In two characters they resemble *Varanus* (*Polydaedalus*) *niloticus* (L.) and *Varanus* (subgenus incertum) *grayi* Blgr. Of the last-named species only one skull of a full-grown individual is known (Zoologische Sammlung des Bayerischen Staates, Munich, nr. 2640/0, Luzon, Philippine Islands, leg. Loher, 1897), and I am greatly indebted to Dr. W. Hellmich, Munich, for the loan of this skull. Prof. R. Mertens kindly interrupted his study of this skull to allow its being sent to Leiden. In his monograph of the Varanidae Mertens (1942a, b, c) published descriptions of the skulls and teeth of the majority of the species and subspecies of the genus *Varanus* and the nume-

rous figures published by that author proved of great value to my study. For a general account of the structure of the *Varanus* skull I may refer to the description of the skull of *Varanus* (*Indovaranus*) *bengalensis* (Daud.) by Bahl (1937: *Varanus monitor*).

Varanus hooijeri nov. spec.

Holotype: Parietal bone, Liang (= Cave) Michael near Longgo, Manggarai, Western Flores.

Paratypes: Right prootic, Liang Michael.
Right maxillary, Liang Michael.
Right maxillary, Liang Toge near Warukia, Manggarai, Western Flores.
Right dentary, Liang Toge.

Diagnosis: A species of the genus *Varanus* with a median crest on the parietal bone; the posterior teeth of the maxillary and dentary are more or less cylindrical, with blunt, almost spherical crowns; the lower surface of the parietal with two low, rounded, bony ridges, which converge posteriorly, and which leave but a narrow groove between them; the prootic has a distinct ledge on its outer surface (dorsally of the otosphenoid crest).

Two of these features (a median crest on the parietal; cylindrical blunt teeth) are found together in but two of the recent *Varanus* species, viz., in the African *Varanus* (*Polydaedalus*) *niloticus* (L.) (Pl. VII fig. 2, Pl. VIII figs. 2, 4, 6) [1]), and in *Varanus* (subgenus incertum) *grayi* Blgr. from Luzon, Philippine Islands (Pl. VII fig. 1, Pl. VIII figs 1, 3, 5) [2, 3]). As these are the only species that show this combination of characters, they have been mainly used for comparison with *Varanus hooijeri*. The bony ridges on the lower surface of the parietal are known from *Varanus hooijeri* only, and they distinguish this species from all other members of the genus.

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1) *Varanus niloticus*, median crest on parietal: Mertens, 1942a, pp. 29, 35, pl. 17 fig. 114, pl. 20 fig. 126; 1942b, pp. 131, 178, 205; blunt teeth: Mertens, 1942a, p. 64, pl. 19 fig. 123, pl. 20 fig. 130; 1942b, pp. 142, 180, pl. 30 fig. 238, pl. 34 fig. 290; 1942c, p. 318).

2) *Varanus grayi*, median crest on parietal: Mertens, 1942b, pp. 131, 200, pl. 24 fig. 172; 1942c, p. 368); blunt teeth: Mertens, 1942a, p. 64, pl. 19 fig. 122; 1942b, pp. 142, 201, 205, pl. 31 fig. 250).

3) A median crest on the parietal is also found in old individuals of *Varanus* (*Varanus*) *gouldii* (Gray) from Australia (Mertens, 1942b, pp. 131, 163, pl. 21 fig. 145), but this species does not develop blunt teeth.

Cylindrical, blunt teeth occur in old individuals of *Varanus* (*Empagusia*) *exanthematicus* (Bosc), and especially in *V.* (*E.*) *e. microstictus* Bttgr. (Mertens, 1942a, p. 64, pl. 19 fig. 124; 1942b, pp. 142, 190-191, 192, 205, pl. 26 figs. 200-205, pl. 30 figs. 241, 242, 244, pl. 34 fig. 295), but this species does not develop a median crest on the parietal.

Old individuals of *Varanus* (*Indovaranus*) *bengalensis* (Daud.) develop somewhat blunt teeth, but these are not as cylindrical and blunt as in the species mentioned above (Mertens, 1942b, p. 183, pl. 25 fig. 196, pl. 34 fig. 287; 1942c, p. 331).

Parietal. Some of the terms applied to parts of the parietal, and used in the description given below, are explained in text-figs. 1-2, in which the parietal of *Varanus niloticus* is shown.

The subfossil parietal from Flores (Pl. IV figs. 1, 2) is damaged. Of the right supratemporal processus only the basal part is preserved, and of the

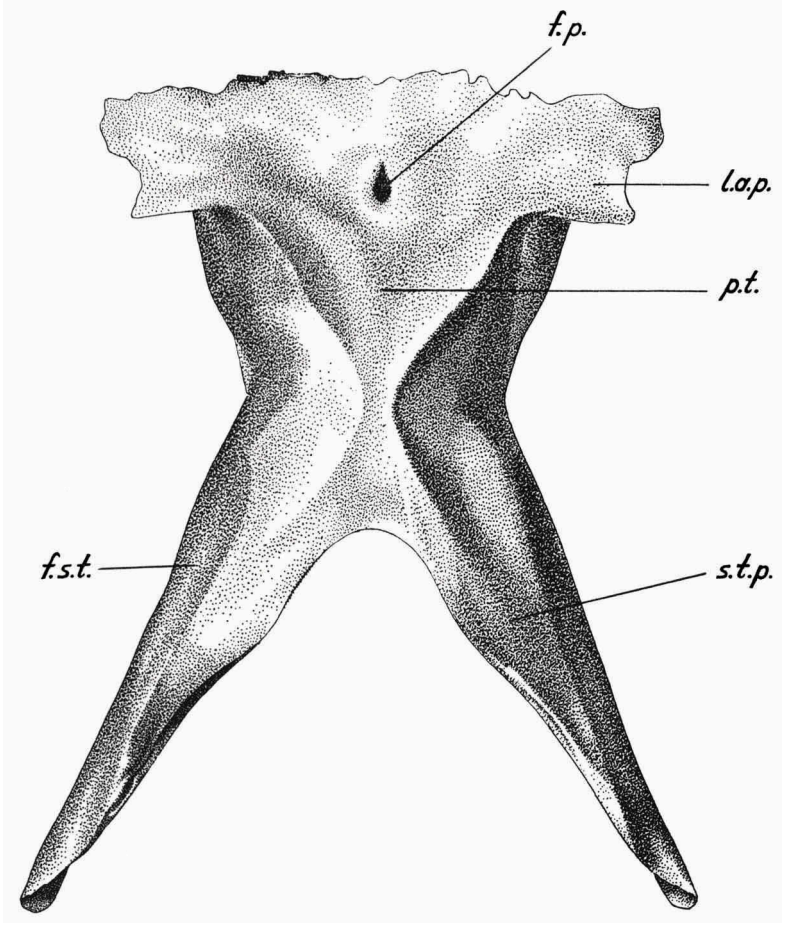


Fig. 1, *Varanus niloticus* (L.), parietal, from above, × 3; *f.p.*, parietal foramen; *f.s.t.*, facet for supratemporal; *l.a.p.*, latero-anterior process; *p.t.*, parietal table; *s.t.p.*, supratemporal process.

left processus the lower border is slightly damaged; the tip of the left anterior processus is broken off, and of the right processus the tip is damaged.

The latero-anterior processes are placed transversely to the longitudinal axis of the parietal; their posterior borders curve slightly posteriorly towards

the tip; at the base of the processes the posterior border forms a distinct angle with the latero-posterior border of the parietal table. In *V. niloticus* the posterior border of the latero-anterior processus also is at an angle to the latero-posterior border of the parietal table, but in this species the processes appear to be broader. In *V. grayi* the latero-anterior processes are directed obliquely forwards and outwards, their (latero-posterior border passes straight into the latero-posterior border of the parietal table.

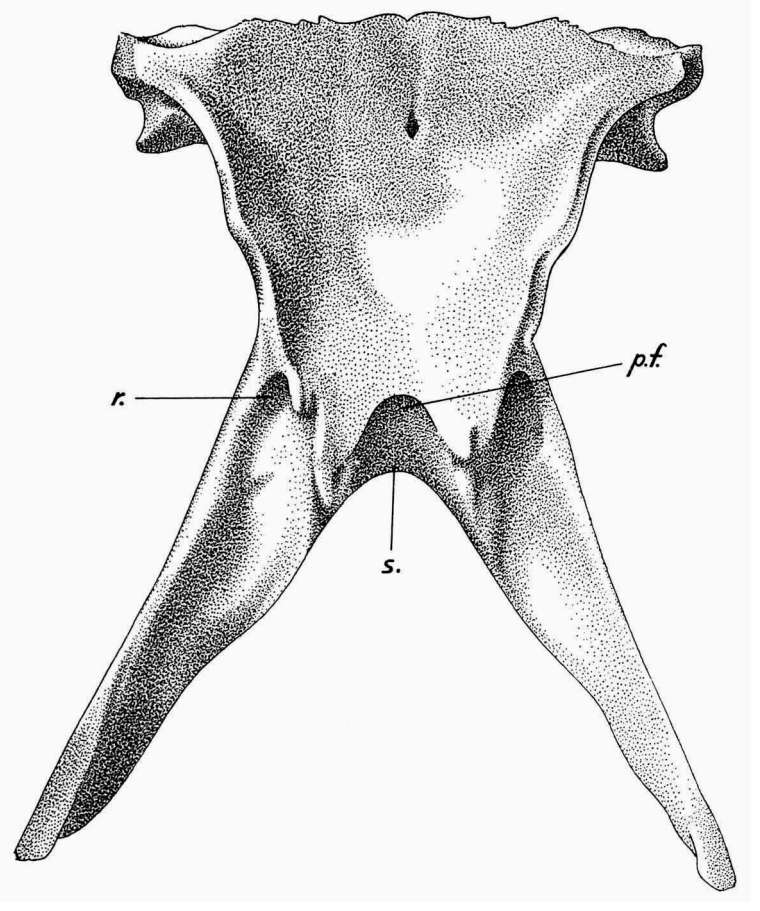


Fig. 2, *Varanus niloticus* (L.), parietal, from below, × 3; *p.f.*, parietal fossa; *r*, recessus at base of supratemporal process; *s.*, shelf.

The parietal of *Varanus hooijeri* is strongly constricted behind the latero-anterior processes, much more so than in other species, as is shown in table 1.

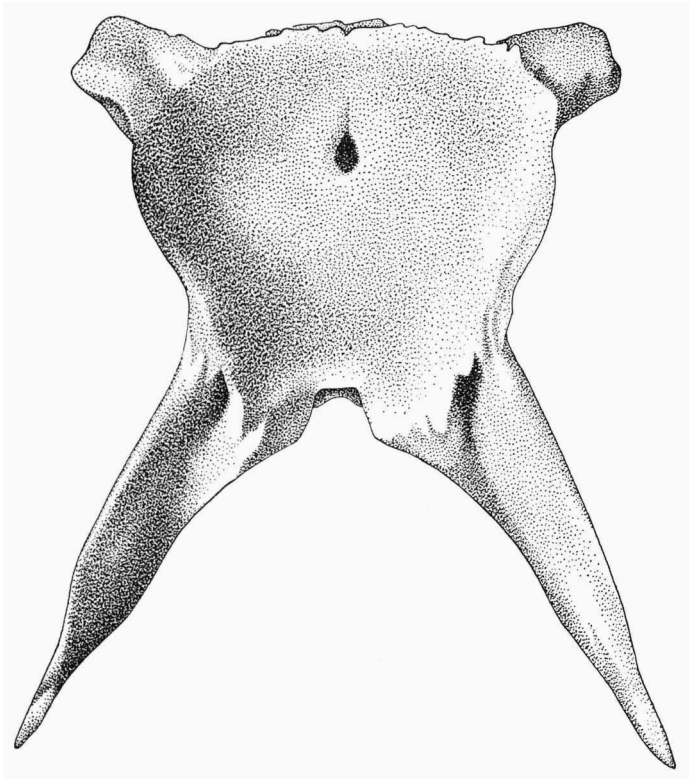


Fig. 3, *Varanus salvator* (Laur.), parietal, from below, × 3.

Table 1. $\frac{\text{Median length of parietal}}{\text{Width at constriction}}$

Varanus hooijeri nov. spec.	3.0
Varanus niloticus (L.)	1.7-2.3
Varanus grayi Blgr.	1.9
Varanus salvator (Laur.)	1.5
Varanus e. exanthematicus (Bosc)	1.2-1.4
Varanus e. albigularis (Daud.)	1.4
Varanus p. prasinus (Schl.)	1.4
Varanus timorensis (Gray)	1.2-1.3
Varanus griseus (Daud.)	0.99-1.3
Varanus komodoensis Ouw.	1.2
Varanus bengalensis nebulosus (Gray)	1.2
Varanus b. bengalensis (Daud.)	0.91-1.1

The parietal table is greatly reduced; it slopes obliquely downwards anteriorly, and its latero-posterior borders are distinctly raised; these borders

merge posteriorly to form the median crest. The distance from the anterior border of the parietal to the anterior end of the median crest is contained 2.3 times in the median length of the bone (1.9 times in *V. grayi*, and 1.5-1.8 times in *V. niloticus*). The median crest is relatively longer in *Varanus hooijeri* than in *V. grayi* and *V. niloticus*; its length is contained 1.7 times in the median length of the parietal in *Varanus hooijeri*, 2 times in *V. grayi*, and 3.1-4.1 times in *V. niloticus*.

The parietal foramen is rather large, and it is placed relatively more anteriorly in *Varanus hooijeri* than in the majority of species; in this respect the new species is equalled and even surpassed by *V. exanthematicus*. The relative position of the foramen is subject to rather wide variations in some species. Data on the position of the parietal foramen are given by Mertens (1942b) for various species and subspecies; these data are given in table 2, which also contains the ratio calculated from measurements taken by me.

Table 2. $\frac{\text{Distance from parietal foramen to posterior border of parietal}}{\text{Distance from parietal foramen to anterior border of parietal}}$

	Mertens (1942b)	Own data [1])
Varanus e. exanthematicus (Bosc)	5	3.2-9.6 (4)
Varanus e. albigularis (Daud.)	—	2.8-6.9 (4)
Varanus hooijeri nov. spec.	—	5.5 (1)
Varanus niloticus (L.)	3.5-4	2.3-4.4 (10)
Varanus grayi Blgr.	3	2.7 (1)
Varanus flavescens (Hardw. & Gray)	about 3	—
Varanus komodoensis Ouw.	about 3	2.0-3.2 (4)
Varanus griseus (Daud.)	2.5-3	2.3-3.4 (3)
Varanus timorensis (Gray)	about 2	2.0-3.8 (2)
Varanus salvadorii (Ptrs. & Doria)	about 2	2.1 (1)
Varanus s. salvator (Laur.)	about 2	1.6-2.0 (7)
Varanus varius (Shaw)	2 or slightly less	2.0 (1)
Varanus b. bengalensis (Daud.)	about 1.5-2	1.5-1.8 (2)
Varanus b. nebulosus (Gray)	—	2.1 (1)
Varanus semiremex boulengeri Kingh.	1.66	—
Varanus p. prasinus (Schl.)	1.5	1.4 (1)
Varanus d. dumerilii (Schl.)	1.5	2.2 (1)
Varanus i. indicus (Daud.)	—	1.4-2.2 (4)
Varanus gilleni Lucas & Frost	—	2.8 (1)

The supratemporal processes are very broad and thick; their upper surface is rounded transversely; it is more convex and more evenly rounded than in *V. grayi*. The lower surface of the basal part is concave; the outer border is almost vertical, and the broad mesial part of the lower surface is about horizontal. Anteriorly the lower surface becomes narower, and there it is bordered

1) The number of specimens examined by me is given in parentheses.

anteriorly and mesially by high walls; in this way a kind of recessus is formed. The mesial wall of this recessus separates it from the parietal fossa. Posteriorly the lower surface gradually passes into the mesio-inferiorly directed inner surface of the free part of the processus. The lower surface of the supratemporal process is much less concave in *V. grayi*. The outer surface of the supratemporal process shows an oblong facet for the articulation with the supratemporal bone. The bases of the supratemporal processes are joined together by a very thick, horizontal, bony shelf, which is relatively longer in *Varanus hooijeri* than in *V. niloticus*, *V. grayi*, and *V. timorensis*; in *V. komodoensis* and *V. salvator* no distinct shelf is formed. In *Varanus hooijeri* the lower surface of the shelf is marked with numerous narrow grooves and ridges, which curve upwards around the thick, rounded posterior edge of the shelf.

The parietal fossa is deep and vertically oval (transversely oval in *V. niloticus* and *V. salvator*). On either side a high, narrow ridge separates the fossa from the recessus on the lower surface of the supratemporal processus; posteriorly each ridge rapidly becomes lower; it continues as a low, but well-marked ridge on either side of the shelf, and it curves outwards and upwards towards the upper border of the supratemporal processus. The lower border of the parietal fossa shows a notch, which is narrower and more pointed in *Varanus hooijeri* than in *V. niloticus*, *V. grayi*, and *V. salvator*. In *Varanus hooijeri* the parietal fossa is placed more anteriorly than in most other species; *V. niloticus* sometimes comes close to it. The relative position of the fossa parietalis is indicated for some species in table 3.

Table 3. Distance from anterior border of parietal fossa to anterior border of parietal / Median length of parietal

Varanus hooijeri nov. spec.	0.53
Varanus niloticus (L.)	0.59-0.83
Varanus t. timorensis (Gray)	0.73
Varanus exanthematicus albigularis (Daud.)	0.77-0.82
Varanus griseus (Daud.)	0.82
Varanus komodoensis Ouw.	0.85
Varanus e. exanthematicus (Bosc)	0.95
Varanus salvator (Laur.)	0.90-0.99

That part of the lower surface of the parietal that forms the roof of the cranial cavity is distinctly concave anteriorly with the parietal foramen at the deepest point; it is much more concave than in *V. grayi*. In most species this surface is trapezoid in outline, with the lateral borders almost straight, some-

what converging posteriorly; just in front of the fossa parietalis this lower surface is almost flat or slightly concave. In *Varanus hooijeri* the lateral borders of the lower surface of the parietal distinctly curve inwards, to curve slightly outwards more posteriorly; in this way the parietal constriction also affects the lower surface of the bone. On either side a thick,. rounded, bony ridge is present; these two ridges converge posteriorly, and in front of the parietal fossa they leave but a narrow groove between. *Varanus hooijeri* apparently is the only species in which such ridges do occur.

Measurements (in mm) of the parietal of *Varanus hooijeri*: median length 33.7; diameter foramen parietale 1.7; greatest width across latero-anterior processes (damaged) 32.4 + ...; width at constriction 11.2; distance from anterior border to the anterior end of the median crest 14.6; thickness of the shelf between the bases of the supratemporal processes 7.4.

Prootic. The right prootic of *Varanus hooijeri* (Pl. V figs. 1-3) is slightly damaged at the anterior rim of the antero-superior process and at the tip of the posterior process; of the antero-inferior process only the basal part is preserved.

The lower border of the antero-superior process, on reaching the body of the prootic, bends downwards and outwards to form a distinctly projecting ledge; the border of this ledge is slightly damaged, and in the complete bone it will have been more projecting still. The mesial surface of the antero-superior process shows a wide, but shallow groove, which becomes narrower posteriorly, and which curves around the outer surface of the bone below the above-mentioned ledge. The outer surface of the basal part of the antero-inferior process is smooth. The posterior process has a convex surface, but in cross-section it is not as markedly keeled as in *V. niloticus* (Pl. V fig. 4). The otosphenoid crest does not end in a posterior spine-like process as in *V. niloticus* (Pl. V fig. 4), but it continues posteriorly as a distinct flange along the greater part of the posterior process. The latero-superior surface of the prootic (between the antero-superior and posterior processes) is very broad.

The mesial surface (Pl. V fig. 2) of the bone does not offer many distinguishing characters. The shallow groove on the mesial surface of the antero-superior process (already mentioned above) is very broad, and its upper border passes obliquely forwards and upwards to the upper border of the process.

Just below the upper border of the prootic, and close to the base of the antero-superior process, the channel for the anterior vertical semicircular canal (*a.c.*) is visible. Close to the base of the antero-inferior process two

foramina are to been seen, the one above the other; the upper is the foramen acusticus anterius (*f.a.*), the lower is the foramen (*f.n.* VII) through which the facial nerve leaves the cranial cavity. At the base of the posterior process the channel (*f.h.*) for the horizontal semicircular canal is visible.

For comparison with the prootic of *Varanus hooijeri*, the prootic of *V. niloticus* is figured (Pl. V fig. 4). The difference between *V. hooijeri* and *V. niloticus* appears to be very striking when the two prootics shown in Plate V are compared. In the prootic of *V. niloticus* the groove on the mesial surface of the antero-superior process is but narrow; where it reaches the outer surface of the body of the prootic, it is bordered above by a hardly distinguishable ridge, while it is bordered below by a somewhat more pronounced ridge; this lower ridge is almost contiguous with the ridge on the spine of the otosphenoid crest. It must be mentioned that the prootic of *V. niloticus* shows considerable variation in the shape of the antero-superior process, and in the width of the latero-superior surface (between the antero-superior and posterior processes). In the skull of a very old individual there is no trace of the narrow groove that commences on the mesial surface of the antero-superior process and continues along the outer surface of the bone.

Right maxillary from Liang Toge (Pl. IV fig. 3; Pl. VI figs. 1, 2; Pl. VII fig. 3). This maxillary is much damaged posteriorly; the posterior part of the bone that articulates with the palatine, the ectopterygoid, and the jugal, as well as the prefrontal process are broken off. Anteriorly the rim that articulates with the premaxillary is very slightly damaged, but I feel convinced that the bone here is almost complete, and that the anteriormost tooth of the fragment is indeed the first tooth of the maxillary.

The antero-mesial border of the fragment (Pl. VII fig. 3) shows an angular emargination, which represents the apertura maxillo-praemaxillaris; although the borders of this emargination may be slightly damaged, it must be concluded that the aperture is fairly large in *Varanus hooijeri*. The excavatio nasalis is a rather deep, oblique groove, which is deepest close to its mesial wall; the outer wall slopes gradually upwards, and its outer border is rounded; the mesial wall rises steeply from the deepest part of the excavatio. The outer surface of the fragment shows seven foramina maxillaria. The mesial border that forms the suture with the septomaxillary is slightly damaged. It is difficult to draw any conclusion from this border as to the possible shape of the septomaxillary, but it seems probable that the outer border of the septomaxillary will prove to show a faint angle.

In this fragment six teeth have been preserved; these are placed in two groups, viz., an anterior group of four small teeth, and a posterior group of two large, molariform teeth. The two groups are separated by a space, where

one large tooth dropped out. Thus, the fragment originally bore seven teeth; allowing for about one tooth having been lost at the posterior end of the series, *Varanus hooijeri* would have about eight maxillary teeth. The anterior four teeth are conical with rather blunt, worn crowns; they gradually increase in size from in front backwards. The posterior teeth are very large, with large, transversely ovoid, blunt crowns. The teeth are pleurodont; at their base they show fine, vertical grooves.

Right maxillary from Liang Michael (Pl. IV fig. 4; Pl. VI figs 3, 4). Anteriorly part of the maxillary with the first two teeth has broken off. Posteriorly it is slightly more complete than the other specimen: it just shows the downward curve of the lower outer border of the maxillary towards the ectopterygoid. Of the prefrontal process the base is preserved.

Only the posterior part of the excavatio nasalis maxillae is preserved, and this is but shallow. The outer surface shows five foramina maxillaria; the most posterior of these is much larger than the others, it is situated above the open space for the last (eighth) maxillary tooth. The fragment bears a series of five teeth, viz., the third to seventh maxillary teeth; the position where the eighth maxillary tooth had been placed is indicated by a rough area. The third to fifth maxillary teeth are conical with blunt tips. The fifth tooth is distinctly larger than either the third or fourth. The posterior two teeth (the sixth and seventh) are much larger with blunt ovoid crowns; the greater, transverse diameter of the crowns is placed obliquely from anteriorly and buccally to posteriorly and lingually. These teeth are much smaller than in the other specimen; this may be a matter of individual variation, or the Liang Michael individual may have been younger, with consequently less strongly developed molariform teeth.

From *V. niloticus* the maxillary of *Varanus hooijeri* differs in the very much different shape of the excavatio nasalis. *V. grayi* has an excavatio nasalis that somewhat resembles that of *Varanus hooijeri,* but in *V. grayi* it is much more shallow. The molariform, posterior maxillary teeth of *Varanus hooijeri* are relatively larger and more broadly oval than those of the old specimen of *V. niloticus* shown in Pl. VIII fig. 2; the posterior maxillary teeth of *V. grayi* (Pl. VIII fig. 1) are less large, and not transversely oval.

Measurements of the maxillary fragments, in mm.

	Liang Toge	Liang Michael
Length of fragment	29.9	27.5
1st tooth, long	2.2	
wide	1.8	
2nd tooth, long	2.1	
wide	1.9	
3rd tooth, long	2.3	2.1
wide	2.4	2.1

	Liang Toge	Liang Michael
4th tooth, long	2.8	3.1
wide	2.5	2.3
5th tooth, long	—	2.9
wide	—	2.8
6th tooth, long	4.2	3.5
wide	6.0	4.6 [1])
7th tooth, long	5.3	3.8
wide	6.3	4.7 [1])

Right dentary from Liang Toge (Pl. VI figs. 5, 6; Pl. VII fig. 4). The fragment of a dentary bears but three teeth.

The anterior tooth is compressed with a blunt tip. The posterior two teeth are much larger, with ovoid, blunt crowns. Of all three teeth the greater transverse diameter is placed obliquely from anteriorly and buccally to posteriorly and lingually; that of the first two teeth almost transversely to the long axis of the dentary. One foramen is visible somewhat posteriorly of the last of the teeth. The lower surface of the dentary shows the groove into which fits part of the splenial.

Measurements of the dentary fragment, in mm:

Length of fragment 36.4, anterior tooth, long 2.2, wide 3.3; middle tooth, long 3.3, wide 4.6; posterior tooth, long 3.2, wide 4.3 [2]).

The characters furnished by the fragments described above are of sufficient importance to recognize *Varanus hooijeri* as a distinct species, but they do not suffice to assign it to any of the subgenera of *Varanus* recognized by Mertens (1942c). A parietal crest is known to occur in the subgenera *Varanus* and *Polydaedalus*, as well as in *V. grayi*, the subgeneric position of which is not settled. Cylindrical, blunt teeth are known from the subgenera *Polydaedalus* and *Empagusia*, as well as from the subgenus to which *V. grayi* belongs. Two features of *Varanus hooijeri* have (at least to my knowledge) never been found in other species of the genus; the converging, bony ridges on the lower surface of the parietal, and the strong ridge on the lateral surface of the prootic above the otosphenoid crest. This may indicate that *Varanus hooijeri* should be referred to a distinct subgenus, but it appears best to leave this question unanswered until more remains of this species become available.

REFERENCES

BAHL, K. N., 1937. Skull of Varanus monitor (Linn.). Rec. Ind. Mus., vol. 39, pp. 133-174, text-figs. 1-17.

1) Greatest, oblique diameter.

2) The greater (oblique) diameter has been termed width.

MERTENS, R., 1942a. Die Familie der Warane (Varanidae). Erster Teil: Allgemeines. Abh. Senckenb. naturf. Ges., nr. 462, pp. 1-116, text-fig. 1, pls. 1-20.

——, 1942b. Die Familie der Warane (Varanidae). Zweiter Teil: Der Schädel. Abh. Senckenb. naturf. Ges., nr. 465, pp. 117-234, text-figs. 2-12, pls. 21-34.

——, 1942c. Die Familie der Warane (Varanidae). Dritter Teil: Taxonomie. Abh. Senckenb. naturf. Ges., nr. 466, pp. 235-391.

HOOIJER, D. A., 1957. Three new giant prehistoric rats from Flores, Lesser Sunda Islands. Zool. Meded., vol. 35, pp. 299-314, pls. XIV-XV.

HEEKEREN, H. R. VAN, 1957. The Stone Age of Indonesia. Verh. Kon. Inst. Taal-, Land- en Volkenkunde, vol. 21, VII + 1-141 pp., text-figs., pls.

VERHOEVEN, TH., 1952. Stenen werktuigen uit Flores (Indonesië). Anthropos, vol. 47, pp. 95-98, 1 text-fig., 2 pls.

——, 1953. Eine Mikrolithenkultur in Mittel- und West-Flores. Anthropos, vol. 48, pp. 597-612, 6 text-figs., 6 pls.

——, 1958. Neue Funde prähistorischer Fauna in Flores. Anthropos, vol. 53, pp. 262-263.

EXPLANATION OF THE PLATES

Plate IV, *Varanus hooijeri* nov. spec.

Fig. 1, parietal, from above, × 2.1.
Fig. 2, parietal, from below, × 2.1.
Fig. 3, maxillary from Liang Toge, from below, × 2.9.
Fig. 4, maxillary from Liang Michael, from below, × 2.7.

Plate V.

Figs. 1-3, *Varanus hooijeri* nov. spec., right prootic; fig. 1, latero-inferior view, × 3.7; fig. 2, mesial surface, × 3.6; fig. 3, lateral view, × 4.
Fig. 4, *Varanus niloticus* (L.), right prootic, lateral view, × 3.9.

Plate VI, *Varanus hooijeri* nov. spec.

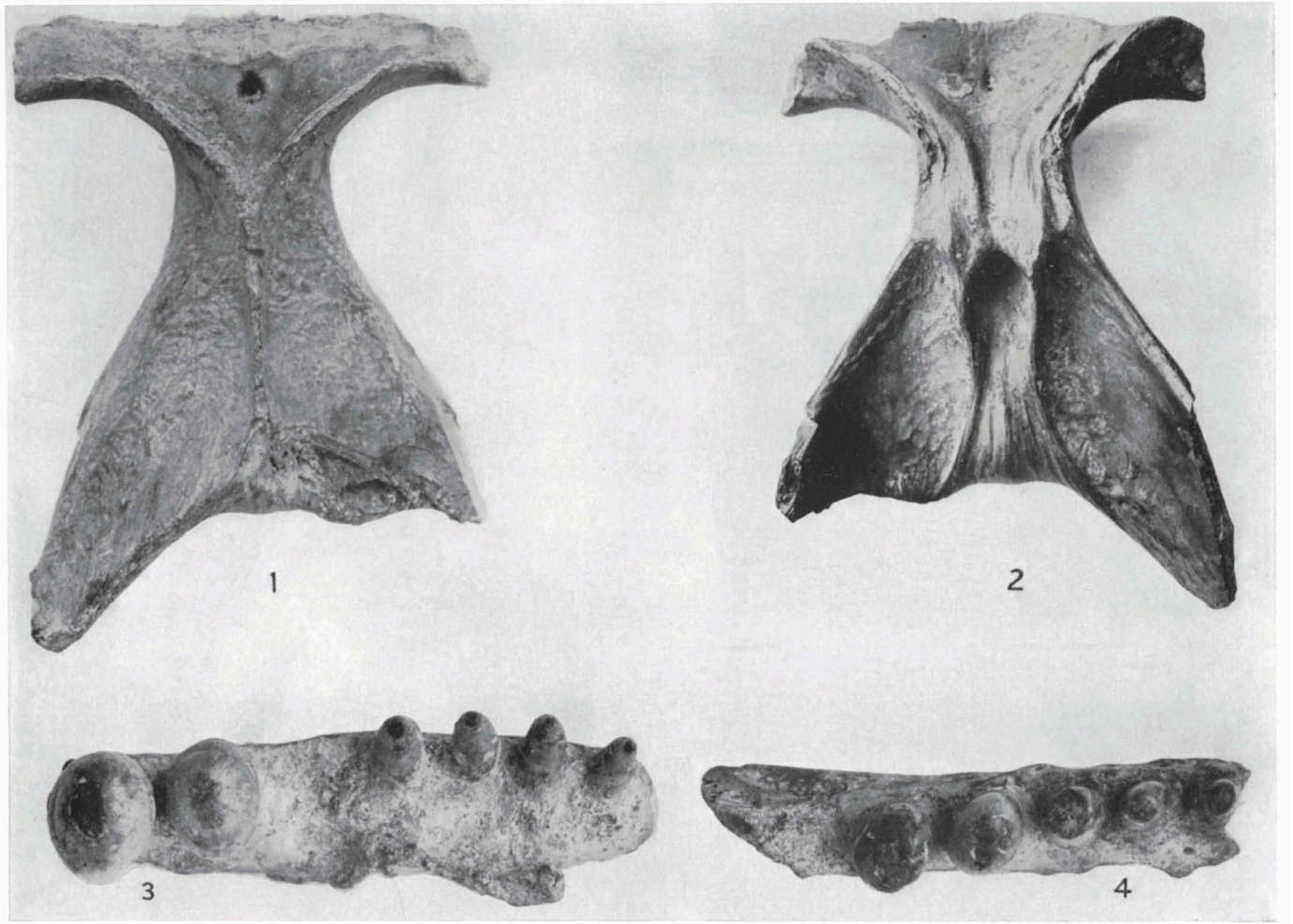
Figs. 1-2, right maxillary from Liang Toge; fig. 1, lateral view; fig. 2, mesial view; both figures × 2.9.
Figs. 3-4, right maxillary from Liang Michael; fig. 3, lateral view; fig. 4, mesial view; both figures × 2.8.
Figs. 5-6, right dentary from Liang Toge; fig. 5, lateral view; fig. 6, mesial view; both figures × 2.4.

Plate VII.

Fig. 1, *Varanus grayi* Blgr., Zool. Samml. d. Bayer. Staates, Munich, no. 2640/0, Luzon, Philippine Islands, leg. Loher, 1897, posterior part of skull to show the shape of the parietal, × 1.7.
Fig. 2, *Varanus niloticus* (L.), M. L., posterior part of skull, × 1.7.
Fig. 3, *Varanus hooijeri* nov. spec., right maxillary from Liang Toge, from above, × 2.9.
Fig. 4, *Varanus hooijeri* nov. spec., right dentary from Liang Toge, from above, × 2.4.

Plate VIII.

Figs. 1, 3, 5, *Varanus grayi* Blgr.; fig. 1, right maxillary, from below; fig. 3, left dentary, from above; fig. 5, lateral view of maxillary tooth-row.
Figs. 2, 4, 6, *Varanus niloticus* (L.); fig. 2, right maxillary, from below; fig. 4, right dentary, from above; fig. 6, lateral view of maxillary tooth-row.
All figures about × 1.7.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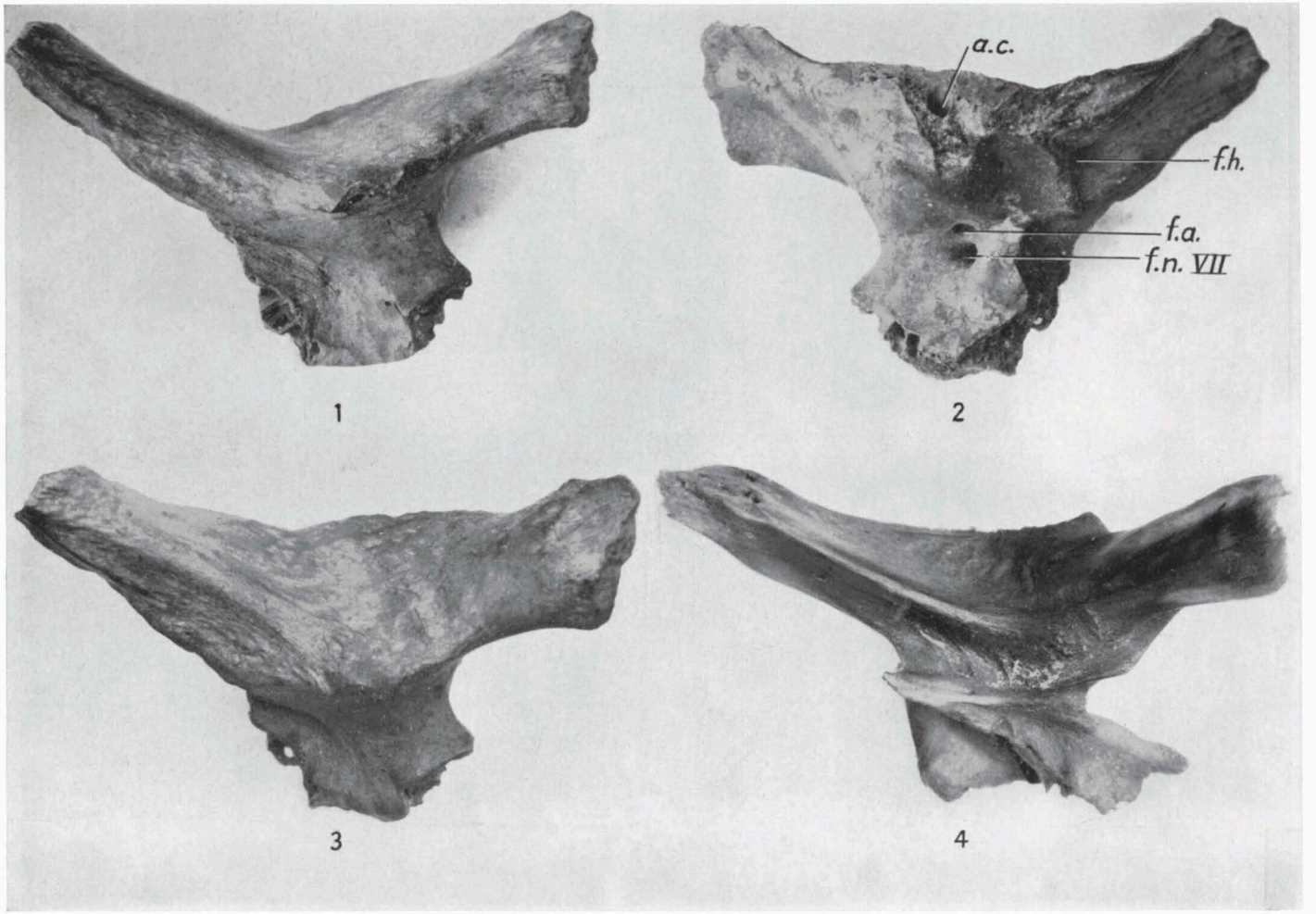
a.c.
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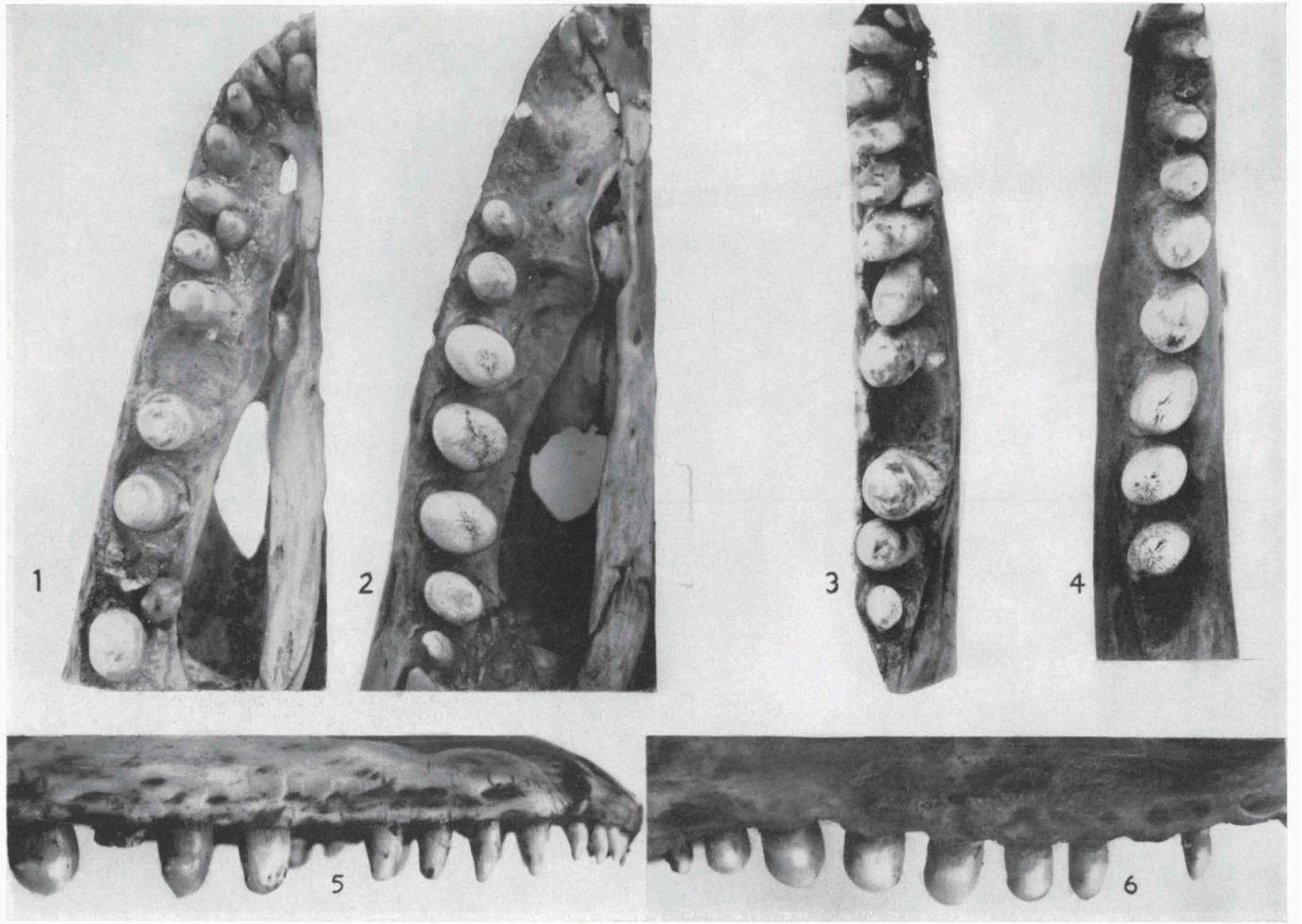
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