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Podocnemis bassleri, a New Species of Pelomedusid Turtle from the Late Tertiary of Peru

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The American Museum of Natural History has had for many years a superb skull of the turtle genus *Podocnemis* from the Tertiary of Peru—the first skull of this genus found fossil in South America.[2]

This skull was donated to the Museum by the late Harvey Bassler in 1937, one of the many fruits of his explorations of eastern Peru.

The skull was prepared in 1937 by Jeremiah Walsh. Further preparation was done in 1940 by John Germann, and photographs then were made. The skull was to have been described by its discoverer, but after the latter's death in 1951 the project of describing the fossil was turned over to Llewellyn I. Price during his Guggenheim visit to this country, and a preliminary description with sketches and investigations into the geology of its occurrence were then made by him. After the return of Mr. Price to Brazil, however, the pressure of other work and his own great distance from the specimen so delayed publication that he in turn gave over the task to the present author, generously surrendering the notes and sketches already made.

The skull appears to represent a new species, which is appropriately named after its discoverer:

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[1] Museum of Comparative Zoölogy at Harvard College.

[2] The existence of this skull has been cited twice (Simpson, 1943, p. 421; Kummel, 1948, p. 1259).

Podocnemis bassleri, new species

TYPE: A.M.N.H. No. 1662, a skull nearly perfectly preserved except as follows: somewhat crushed posteriorly and cavum tympani and occipital and temporal regions therefore somewhat deformed; the tomial and narial borders of the left maxilla and left premaxilla slightly damaged; the thin outer margins of the pterygoids broken away; small portions of the opisthotic and squamosal of the right side missing.

TYPE LOCALITY: Rio Aguaytia, eastern Peru (about latitude 8° 10′ S., longitude 75° 15′ W.).

HORIZON: Tertiary, Contamana group.

COLLECTOR: Harvey Bassler.

DIAGNOSIS: Close to *Podocnemis expansa,* differing only in the apparently larger size, in the relationship of the internal palatal processes of the maxillae (which project abruptly dorsally and do not lie extended anteroposteriorly as in the Recent species), and in the slightly shorter relative distance from snout tip to posterior borders of the orbits.

GEOLOGICAL OCCURRENCE AND AGE: The Standard Oil Company of New Jersey has generously permitted examination by L. I. Price of Bassler's report on the parts of the Ucayali drainage system in eastern Peru studied in 1923. From this report it appears that the *Podocnemis* skull was found in Aguaytia region just below the mouth of the Santa Ana (= Ó Nandihuacay) where there is a settlement called Purma. It was obtained in "a gray arkosic sandstone and conglomerate with lime carbonate nodules belonging to the Transition Beds" of the Contamana group.

Bernhard Kummel, who has studied and reported (1948) on the geology of this region, infers from Bassler's description of the lithology that the fossil came from the uppermost part of the Contamana group. The Contamana group contains beds believed to range from Eocene to Miocene and possibly Pliocene[1] in age and is overlain by horizontal beds, tentatively dated at latest Pliocene or perhaps Pleistocene.

Bassler himself dated the skull as Miocene while Simpson (1943) has referred to it as "mid-Tertiary." The fossil itself is so close to a Recent species as to tend to support the latest date geologically permissible.

DESCRIPTION: Certain of the more conspicuous skull characters of *Podocnemis* have recently been presented as part of a key to the living species of the genus by Williams (1954). The Peruvian fossil is sufficiently close to *expansa* to appear referable to that species when compared with the description in the key.

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[1] Patterson (1942, pp. 5–7, and personal communication) considers that the orogeny involving these Cenozoic deposits culminated in late Pliocene time.

As in *P. expansa* and as in all but one of the other living South American species of the genus there is a forehead groove. As in *P. expansa* this groove is rather shallow.

The temporal region is strongly emarginate ventrally, moderately emarginate dorsally. The supraoccipital spine is long, with a thin dorsal crest surmounting a rather broad horizontal blade. The orbits are fully exposed dorsally, obliquely set; interorbital width is less than height of orbit; height of orbit is less than depth of maxilla externally at the middle of the orbit. In all these features the fossil resembles *P. expansa.*

An elongate interparietal scute is defined by grooves on the dorsal surface of the skull. This scute is relatively longer and its front border more strongly arched forward than in *P. expansa.* In spite of these features it is notably behind the posterior borders of the orbit and separated from them by a distance nearly equivalent (9/10) to the interorbital width, whereas the same scute in *P. expansa* is separated from the orbits by a distance only two-thirds of the interorbital width.

As in *P. expansa* there appears to be no subocular scute, the frontal scute meeting the maxillary scute behind the eye.

The greatest dorsal width of the skull has been somewhat increased by crushing. The differences in dorsal length-width relations between the

TABLE 1

MEASUREMENTS (IN MILLIMETERS) OF *Podocnemis bassleri* COMPARED WITH THOSE OF *Podocnemis expansa*

	P. bassleri	*P. expansa*	
		Two Largest	18 Additional
Condylobasal length	157	124, 122	63–120
Quadrate breadth	130	98+,[a] 101	47– 97
Interorbital width	22	16, 15	8– 17
Orbital length	28	24, 23	13– 23
Length to posterior border of orbits	37	34, 31	19– 32

[a]The specimen is damaged in this region. Both this and the next largest *P. expansa* skulls are unnumbered specimens in the collection of the Museum of Comparative Zoölogy.

fossil and *P. expansa* may therefore be regarded with skepticism. A fairer measure of relation between width and length is probably to be found in a comparison of the condylobasal length and the quadrate breadth. In the ratio of these the fossil falls within the range of *P. expansa.*

The dorsal suture pattern in the fossil seems to be identical with that in *P. expansa.*

As in *P. expansa,* the premaxillae were probably squared off rather than notched at the symphysis, but damage in this region makes interpretation rather difficult.

The ridges on the triturating surfaces are almost exactly as in typical *P. expansa:* (1) a short anterior ridge beginning on the premaxilla and extending a short distance onto the maxilla; (2) a ridge parallel to this beginning at the premaxillary suture and extending posteriorly almost to the end of the triturating surface; (3) a broad roughened area parachoanal in position, converging anteriorly towards the second ridge, not parallel to it. This third ridge or roughened area is very low and broad in the fossil, as it is occasionally in *P. expansa.* In the fossil there is no evidence of the faint ridge on the internal surface of the tomium which is regularly present in *P. expansa.*

TABLE 2

RATIOS OF SKULL MEASUREMENTS IN *Podocnemis bassleri* AND *Podocnemis expansa*

	P. bassleri	*P. expansa*	
		Two Largest	18 Additional
Quadrate width/condylobasal length	0.82	0.80+, 0.82	0.75–0.82
Length to posterior border of orbits/ condylobasal length	0.23	0.27, 0.25	0.24–0.32
Interorbital width/quadrate width	0.16	0.16, 0.14	0.15–0.17
Orbital length/condylobasal length	0.17	0.19, 0.18	0.18–0.32

In contrast to the condition in *P. expansa* the premaxillae of the fossil reach the margins of the choanae, and also the choanal notch between the maxillae extends relatively somewhat farther forward and is somewhat more pointed. Triangular maxillary flanges which meet medially are present in the fossil as in *P. expansa* (fig. 2, m'), but in the fossil these flanges are not visible in direct ventral view and must be examined by looking anteriorly into the choanae. There they will be seen as small vertical plates which meet dorsally the tips of the slender palatine processes that complete the division of the choanae, supplying the place of the absent vomer. In *P. expansa* similar slender processes of the palatine are often or usually present and approach or meet a small ventral tubercle of the horizontal maxillary medial processes. The difference between the fossil and *P. expansa* in this area of the skull thus consists not in a funda-

mentally different relationship but in the placement of the internal palatal processes of the maxillae whether vertically as in the fossil or horizontally as in the Recent species. Were the snout region less perfectly preserved

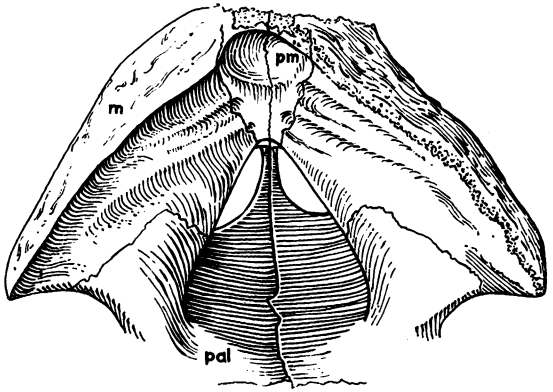

FIG. 1. *Podocnemis bassleri*, new species. A.M.N.H. No. 1662. Anterior palate of type. Condylobasal length, 157 mm. *Abbreviations:* m, maxilla; pal, palatine; pm, premaxilla. × 2/3.

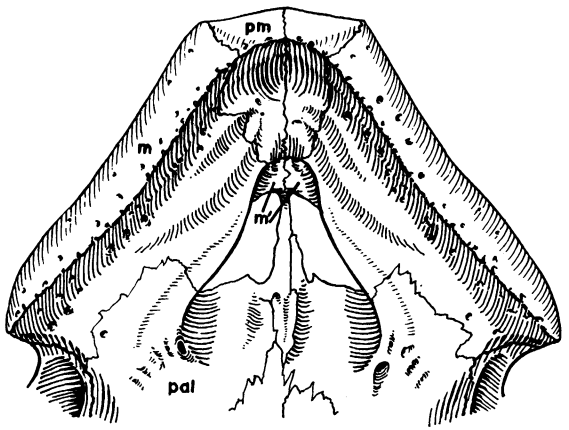

FIG. 2. *Podocnemis expansa*. Palatal view of skull. M.C.Z. specimen. Condylobasal length, 122 mm. *Abbreviations* m, maxilla; m′, horizontal internal flanges of maxillae; pal, palatine; pm, premaxilla. × 2/3.

this difference could not have been detected; were there any trace of crushing in this region the difference could not be believed.

In the fossil the foramina incisiva appear to lie within the small vertical section of the premaxillae at the choanal margin where the latter join the vertical internal processes of the maxillae.

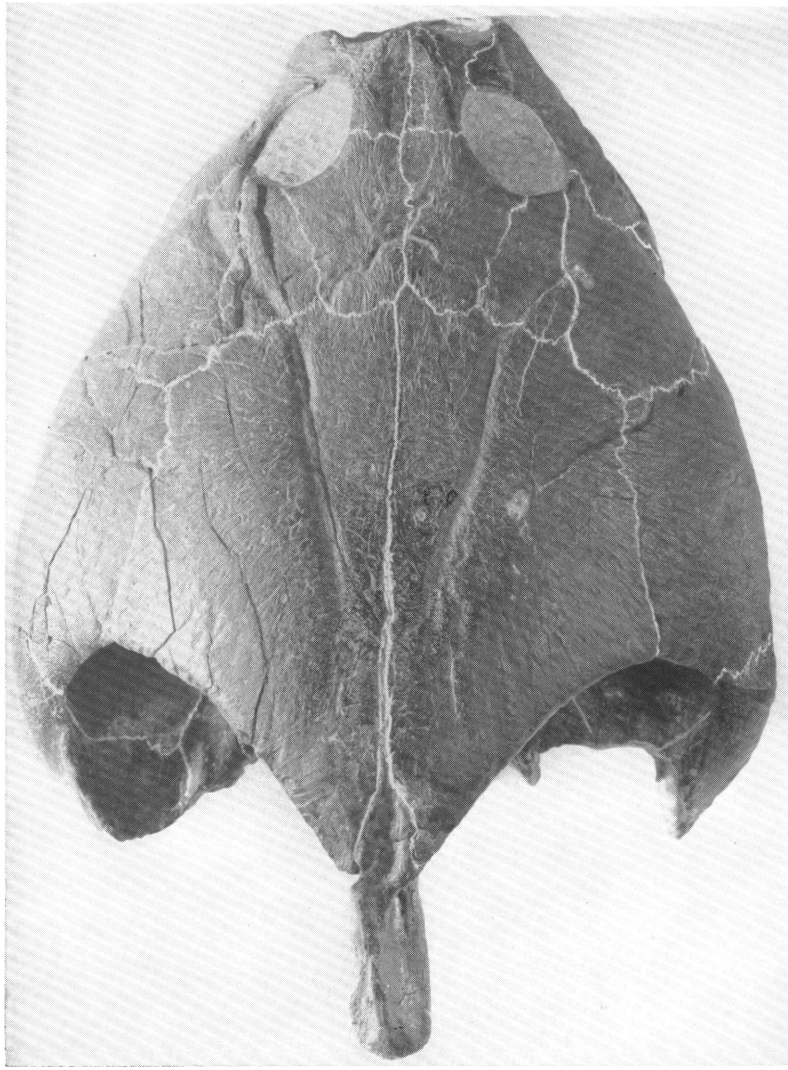

FIG. 3. *Podocnemis bassleri*, new species. A.M.N.H. 1662. Dorsal view of type skull. × 2/3.

The posterior portion of the palate appears to differ in no way from that of *P. expansa*. There are the same ectopterygoid processes projecting quite laterally and not obliquely posteriorly as in some other *Podocnemis* species. There is a median ridge marking the median suture of the pterygoids. The large "carotid" channels, characteristic of the

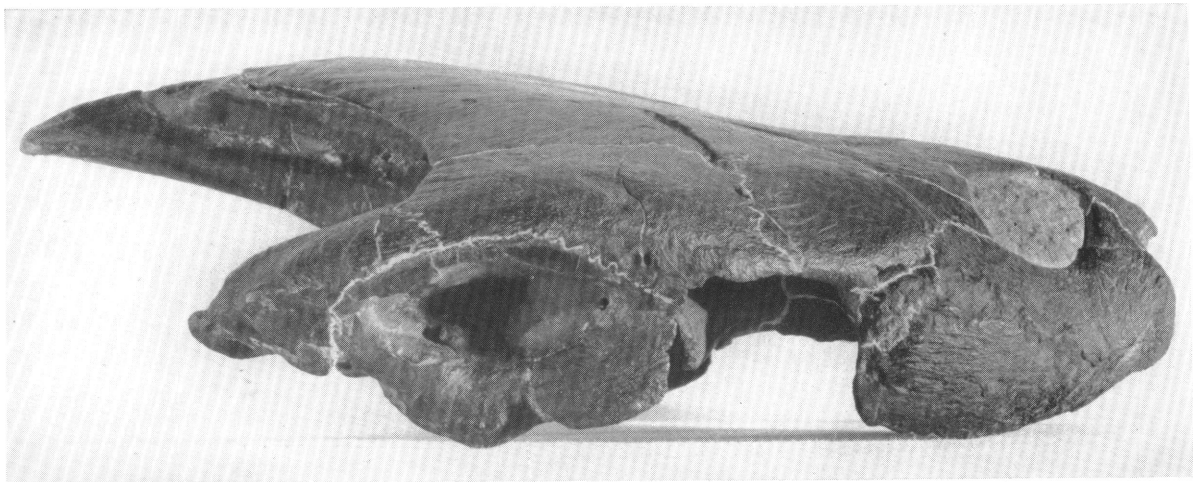

FIG. 4. *Podocnemis bassleri*, new species. A.M.N.H. 1662. Lateral view of type skull. × 2/3.

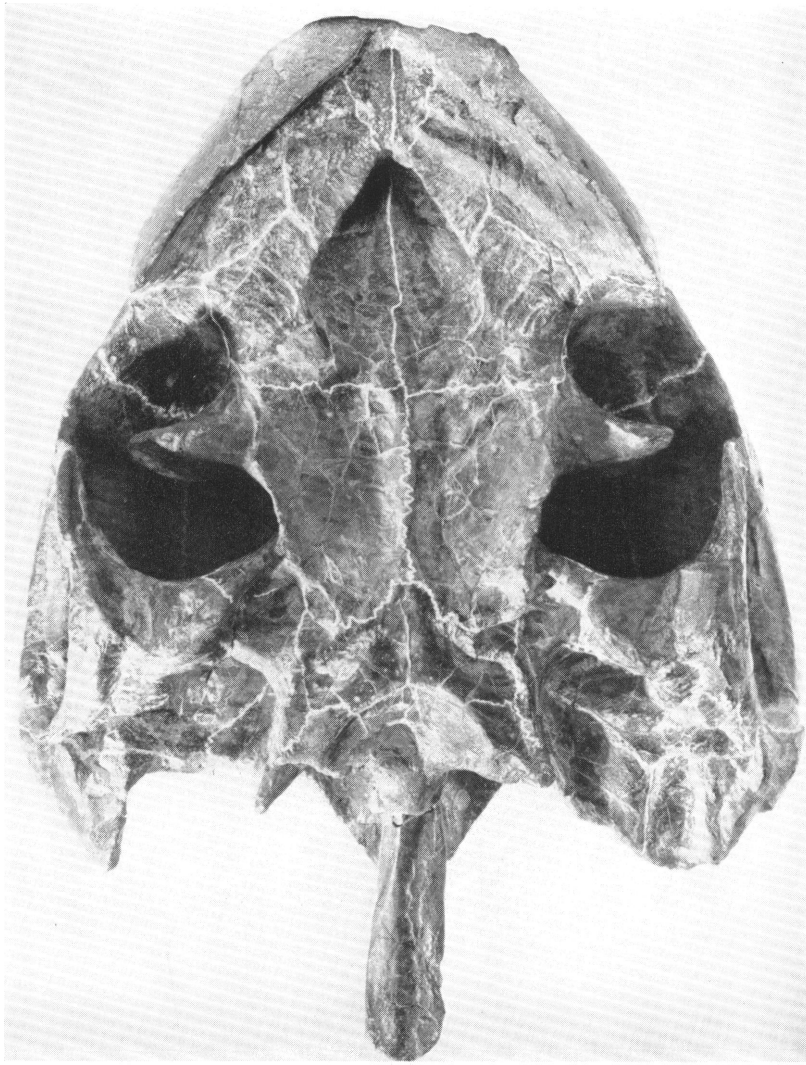

FIG. 5. *Podocnemis bassleri*, new species. A.M.N.H. 1662. Ventral view of type skull. × 2/3.

genus and its fossil relatives, are plainly visible. The oblique tubera and the shallow precondylar fossa of the basioccipital are quite typical, as are the transversely concave quadrate articular facets. The quadrate as in all members of the genus is in contact with the basioccipital and as in *P. expansa* there is a relatively long suture, not transverse but oblique and carried relatively far back.

The otic region is not well enough preserved to be discussed profitably at any length. So far as can be seen there was no precolumellar fossa, but no entrance to a postotic antrum can be seen either. The precolumellar fossa tends to disappear, and the entrance to the postotic antrum tends to narrow in fully adult *P. expansa*. If real the situation seen here may be a continuation of a trend seen in *P. expansa*. The opisthotic in the fossil may lack a distinct projection posterior to the squamosal but preservation makes this point uncertain.

COMMENT: The skull here described as *Podocnemis bassleri* derives its greatest interest from the fact that it carries the lineage of *P. expansa* back to the mid-Tertiary. The fossil may not indeed represent the direct ancestor of the Recent species, but it is certainly a very close relative and thus is the very first of all the fossil pelomedusids of the New World that can be shown to have a close relation to a living form. Of the New World fossils formerly referred to *Podocnemis,* some have already been removed to other genera (Zangerl, 1947; Price, 1953), and the remainder may require similar action when better known. Not until the present specimen has there been any reason even to suspect a direct phyletic relation to any living South American species in the case of any of the now rather numerous described pelomedusids of North and South America. Until now the fossils have been without progeny and the living forms without ancestry. This, however, is simply a lack of knowledge from which no inference may be drawn—one of many lacunae in our knowledge of the history of South American turtles. As a first contribution to the filling of an unfortunate gap in our information, *Podocnemis bassleri* is a welcome addition.

ACKNOWLEDGMENTS

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