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ABSENCE OF MESOPLASTRA IN A *PELOMEDUSA* (TESTUDINES, PELOMEDUSIDAE)

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Mesoplastra (a pair of bones intercalated between hyo- and hypoplastra) are believed to be primitive features in turtles. They were often present in Jurassic and Cretaceous genera, and two pairs of mesoplastra were reported by Fraas (1913) in *Proterochersis*, one of the Triassic genera. Mesoplastra have, however, been lost several times independently: (1) in the Jurassic and Cretaceous plesiochelyids and thalassemydids; (2) in Wealden *Chitracephalus*; (3) in all cryptodires; (4) in the chelids among pleurodires. In many of the groups in which they are known, they were early reduced. Primitively they extend quite across the plastron and meet centrally. In some Pleurosternidae, however — *Platychelys* — and in some Baenidae (within the genus *Baëna*, cf. *Baëna riparia*, Hay, 1908) they fail to meet in the center.

To my knowledge, however, no instance has been recorded previously of the complete absence of mesoplastra in any form in which they were typically present. Such an example is now furnished by a specimen of *Pelomedusa subrufa* from Uganda, collected by Delme Radcliffe and now 1905-5-19-1 in the collections of the Reptile Section, British Museum (Natural History).

In *Pelomedusa* the mesoplastra are typically small and lateral. In BM 1905-5-19-1, however, no mesoplastra are visible, and instead the hyo- and hypo-plastra join for their full transverse extent and do so quite symmetrically on the two sides just as in the Chelidae or the Cryptodira. The carapace again joins the plastron perfectly without affording any place for a trace or rudiment of mesoplastra.

Yet this specimen is clearly referable on "habituellen Merkmalen" to the family Pelomedusidae, the genus *Pelomedusa*, the species *subrufa* (the single species of the genus).

The carapace is quite normal except for some minor asymmetries and the fusion of vertebrals 3 and 4 to a single scute. The nuchal scute is, as usual, absent. The first neural is rather characteristically tapered in front. In normal fashion there are 7 neurals, and the posterior pleurals meet behind the neurals separating them from the suprapygal. In contrast to chelids the posterior peripherals are all rather narrow and show no suggestion of posterolateral expansion.

The plastron is quite typical of the genus in the size and relations of its horny scutes. There is the usual median fontanelle, though it is small in this instance, as seems frequently to be the case in northern representatives of the genus and species.

The skull is quite characteristically pelomedusid and very unchelid in the temporal emargination from behind and in the marked projection of the opisthotic posterior to the squamosal.

All these features and the lack of mesoplastra are well shown in the excellent photographs (Plates 1 and 2) taken by Peter Green of the photographic staff of the British Museum (Natural History) and reproduced by permission of the Trustees of that institution.

The absence of mesoplastra is quite certainly an individual variation. Four specimens from Mt. Elgon, Uganda, otherwise very similar to the individual without mesoplastra, all show these elements well-developed and only slightly varying in size. All resemble the aberrant specimen in the reduction of the median fontanelle of the plastron; one, indeed, has the fontanelle completely closed.

The presence of mesoplastra is supposedly a family character of the Pelomedusidae, but except in the genus *Pelusios* the mesoplastra are always small and lateral, in effect vestigial, and the disappearance by individual variation of a vestigial feature is not too surprising.

It is, however, of special interest in connection with the suggestion recently made by me that the genus *Pelusios* with well-developed mesoplastra (meeting medially) has been derived directly from the genus *Pelomedusa* with reduced mesoplastra by a secondary expansion of these elements. If this suggestion be valid, then, taken in connection with the present case, we see in *Pelomedusa* an interesting ambivalence of evolutionary potentiality, one type of variation reversing a previously well-defined trend to restore (with some differences) an ancestral condition and, on the other hand, the opposite type of variation

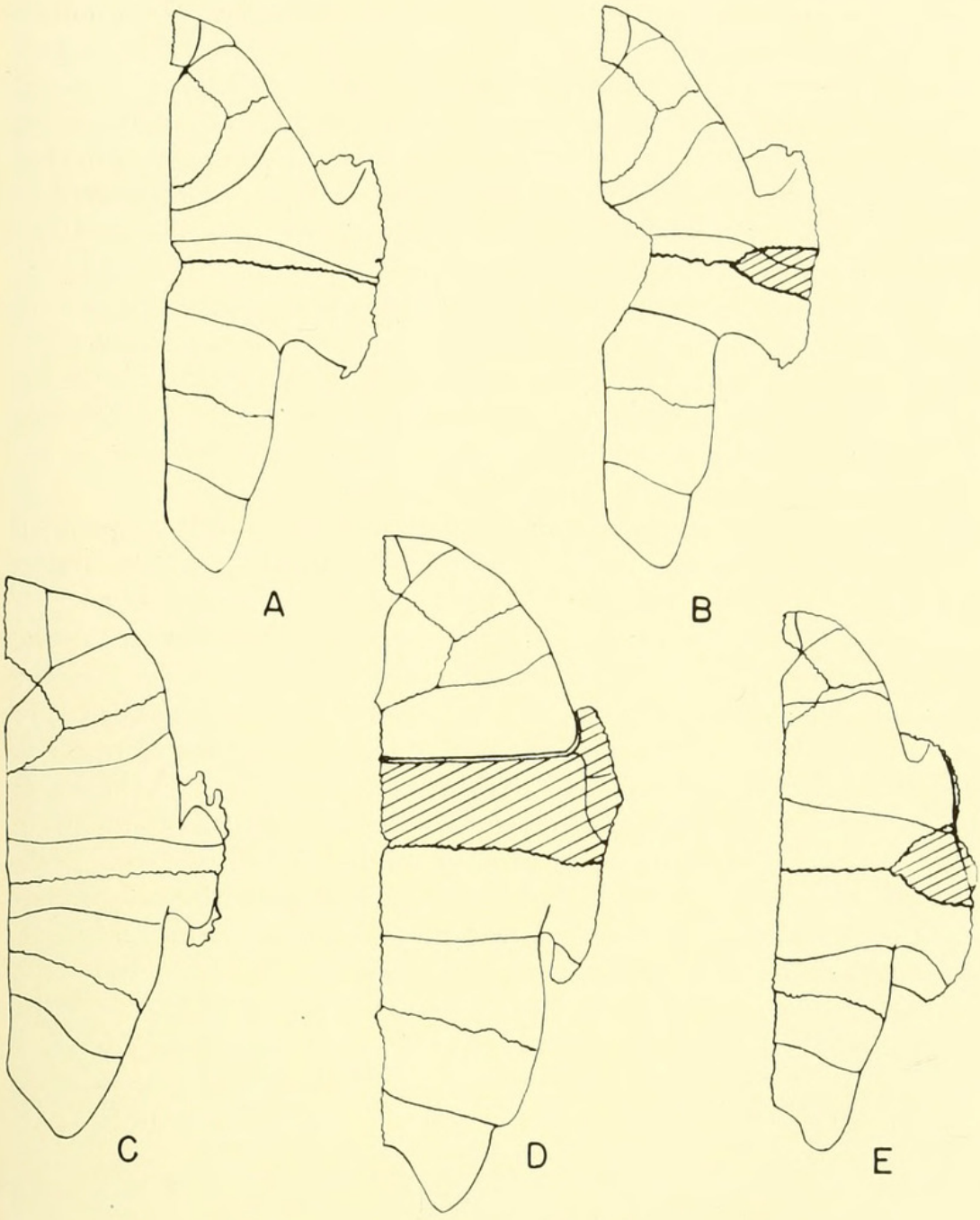

Figure 1. Plastra of various turtles to show presence or absence of mesoplastra. Mesoplastra shaded. A. *Pelomedusa* without mesoplastra. B. Normal *Pelomedusa*. C. a chelyid (*Hydromedusa*). D. *Pelusios*. E. *Podocnemis*. (B to E after Boulenger.)

carrying to completion the former trend and realizing a more modernized type of shell.

It does not seem advisable on the basis of a single, probably rare, variation to revise the definition of the family Pelomedusidae to include forms without mesoplastra. Such a variation would appear — on the face of the present evidence — to have as little taxonomic weight as the occasional men born without legs have for the definition of the family Hominidae.

Yet there is this difference: a man without legs is not likely to be a selectively valuable variant, but, as the majority of the living forms testify, a turtle without mesoplastra is not only perfectly viable but highly successful. It cannot be assumed, therefore — given a forward-looking evolutionary point of view — that the pelomedusids will always and in all cases be forms possessing mesoplastra.

There is indeed a special caution pertinent for paleontologists. If the present specimen had been found as a fossil, it would almost certainly have been misallocated as to family. There is in fact no assurance — the pelomedusids having once been world-wide — that all past species have always had mesoplastra. The use of key characters in identification without regard to total habitus and neglecting the ever surprising power of animals to vary and to undergo evolutionary change will only lead to error.

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REFERENCES

Fraas, E.

1913. *Proterochersis*, eine pleurodire Schildkröte aus dem Keuper. Jahreshefte Ver. Vaterlands Württ. Naturkunde, Stuttgart, 1913, pp. 13–30.

Hay, O. P.

1908. Fossil turtles of North America. Carnegie Inst. Washington Publ. No. 75, pp. 1–568.

Loveridge, A.

1941. Revision of the American terrapins of the family Pelomedusidae. Bull. Mus. Comp. Zool., vol. 88, pp. 467–524.