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NEW TURTLE REMAINS FROM THE UPPER CRETACEOUS OF THE GOBI DESERT, MONGOLIA

Abstract. — New finds of turtle remains collected in 1970 by the Polish-Mongolian Palaeontological Expedition from the Upper Nemegt Beds in the environs of Nemegt, Nemegt Basin and in Sheeregeen Gashoon are discussed in the present paper. Large specimens of the group Amphichelydia, *Mongolemys elegans* KHOSATZKY & MŁYNARSKI, *Zangerlia* sp., two different forms (small and large) of the genus *Trionyx* and unidentified forms with a strongly serrate ridge of carapace have been found in the Upper Nemegt Beds. A specimen assigned to *Mongolemys* sp. comes from Sheeregeen Gashoon.

INTRODUCTION

New, not very rich but relatively well-preserved remains of various chelonians were found during the Polish-Mongolian Palaeontological Expedition in 1970.

Most of the materials have been collected from the Upper Nemegt Beds (GRADZIŃSKI *et al.*, 1968/69) in the northern part of the locality Nemegt, Nemegt Basin. The turtles of the same age have been found in Tsagan Khushu, Nemegt Basin, and described by KHOSATZKY & MŁYNARSKI (1971).

One of the specimens, coming from the locality Sheeregeen Gashoon (KIELAN-JAWOROWSKA & BARSBOLD, 1972), is rather incomplete and damaged. It was determined as *Mongolemys* sp. The exact age of the Upper Cretaceous deposits of Sheeregeen Gashoon has not been hitherto recognized. The identified specimens from the Upper Nemegt Beds of the locality Nemegt do not on the whole differ from those from the same beds found in the locality Tsagan Khushu (KHOSATZKY & MŁYNARSKI, 1971). They are briefly described or illustrated in the present paper only for the sake of documentation.

DESCRIPTIONS

Suborder **AMPHICHELYDIA** LYDEKKER, 1889

AMPHICHELYDIA gen. et sp. indet.

(Text-fig. 1)

Material. — 1) A skull of a large individual, 13.5 cm long, very strongly damaged and preserved mostly as a mould with fine fragments of bones (Z.Pal.No.MgCh/78); 2) A well-preserved fragment of a posterior ridge of carapace of a large individual, including peripherals X and XI, as well as a pygal plate (Z.Pal.No.MgCh/85). Both specimens from the Upper Nemegt Beds of the locality Nemegt, Nemegt Basin.

Description. — The specimen Z.Pal.No.MgCh/85 makes up a fragmentary posterior ridge of carapace. Judging by the size of the plates preserved the entire carapace of this indi-

vidual was about 80 cm long. Well-preserved sulci allow one to reconstruct the shape of the last marginals 10 and 11, as well as postcentrals whose sulcus intersects the right ridge of pygal plate. Shields are markedly lower than the peripheral plates. The pygal ridge of carapace flat, conspicuously narrowed (Text-fig. 1). The surface of plates is covered with a primitive ornamentation, the same as that on the fragments of shells of large specimens of the same group coming from the locality Tsagan Khushu (KHOSATZKY & MŁYNARSKI, 1971, p. 131—144).

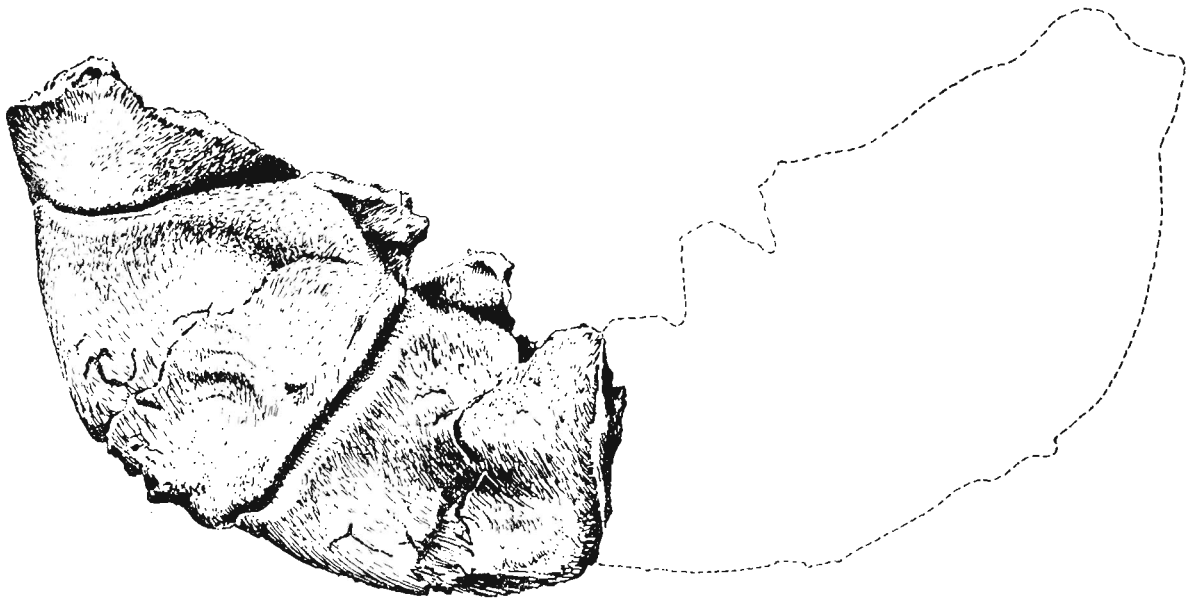

Fig. 1
Amphichelydia gen. et sp. indet., fragment of the pygal ridge of a carapace; Upper Cretaceous, Upper Nemegt Beds, Nemegt, Nemegt Basin, Gobi Desert (Z.Pal.No.MgCh/85); × 0.5.

The specimen Z.Pal.No.MgCh/78 is a strongly destroyed skull of a large individual whose shape, preserved on a mould, is similar to the skull of a large turtle from the Nemegt Basin housed at the Palaeontological Museum of the U. S. S. R.'s Academy of Sciences in Moscow (ROZHDESTVENSKY, 1969, p. 81). Z.Pal.No.MgCh/78 has well-preserved frontals and parietals, as well as left postfrontals which, together with frontals, form the ridge of an orbit. Otic region strongly developed. Fragments of occipital region strongly crumbled. The surface of bones from the preserved parietal region is uneven, rough and indicative of a strong fusion of the epidermal layer to the outer surface of bone. This is a character of many primitive turtles, is particular the Amphichelydia.

Suborder METACHELYDIA ZANGERL, 1969
Family DERMATEMYDIDAE GRAY, 1870
Genus **MONGOLEMYS** KHOSATZKY & MŁYNARSKI, 1971
Mongolemys elegans KHOSATZKY & MŁYNARSKI, 1971

Diagnosis. — See KHOSATZKY & MŁYNARSKI, 1971, p. 131—144.

Material. — 1) An almost complete although deformed carapace together with a posterior part of plastron of a large individual (Z.Pal.No.MgCh/74); 2) A well-preserved, 24 cm

long carapace without a neck ridge (Z.Pal.No.MgCh/75); 3) A damaged anterior cranial part of carapace and part of an anterior lobe of plastron of a large individual; the fragment preserved is 7.2 cm long (Z.Pal.No.MgCh/79); 4) Thirteen shell fragments of a few individuals varying in size (Z.Pal.No.MgCh/82a); 5) Seven fragments of carapace of large individuals (Z.Pal.No.MgCh/87). All specimens from the Upper Nemegt Beds, Nemegt, Nemegt Basin.

Mongolemys sp.

(Text-fig. 2)

Material. — An almost complete although strongly damaged carapace and a strongly damaged and broken plastron of an individual about 20 cm long (Z.Pal.No.MgCh/71) from Sheeregeen Gashoon.

Description. — A single specimen from Sheeregeen Gashoon is poorly preserved. The surface of carapace was covered with a very hard cemented layer which obscured the structure of plates. After it has mechanically been removed, a delicate dermal sculpture turned out to be damaged. The shape of the entire carapace and an approximate shape of plastron can be accurately reconstructed on the basis of this specimen. Carapace is not very strongly vaulted, smooth, without any traces of keels. Its peripheral ridge is quite even, not serrate or undulate. Carapace oval in outline with only a slight tendency to an extension towards the lacking pygal part. Plastron elongate, cross-shapped, with a relatively narrow but long posterior lobe. It is connected with carapace by a wide bridge. All its elements were strongly connected with each other.

All sutures and sulci are excellently visible in the part of carapace preserved. Of the lacking pygal part detached fragments are also preserved completely exposed on the inner side. Proneural plate, not very large, wide and symmetrical, is connected with neural N-I having convex lateral ridges. The remaining neurals, that is, N-II to N-VI are hexagonal, relatively wide and narrowing caudally. Their series seems to be uninterrupted but the last plates of the pygal region are lacking. Pleurals wide and with long ridges parallel to each other. Peripherals markedly lower than marginals resting on them.

The shields preserved are irregular in shape. Centrals are longer than wide, laterals wide and marginals not very high. No sulci of the praecentral shield have been preserved. If this shield occurred at all it was very small and narrow as shown by a small indentation which might correspond to the shape of shield and which is visible in this place.

Neither epiplastra nor entoplastron have been preserved. The shape of entoplastron might be reconstructed on the basis of a suture preserved along the edge of the fracture, which was probably very small as compared to the entire plastron. Plastron triangular and shoved far anteriorly together with small and delicate epiplastra Hyo- and hypoplastra very large, massive and the sutures which connect them with each other are particularly distinct on the inner side. Massive xiphiplastra are connected with each other by a characteristic, zigzagging suture. The sulci of shields poorly preserved, characteristic of *Mongolemys elegans*. Fragmentary sulci of one of the inframarginals are visible on the right side.

Discussion. — The specimen under study should be assigned to the representatives of the family Dermatemydidae. It displays the largest similarity to the representatives of *Mongolemys elegans* from the Upper Nemegt Beds. The Sheeregeen Gashoon Beds are most probably older than the Upper Nemegt Beds, their exact age is, however, not determined. The lack of a distinct, characteristic dermal sculpture prevents one from assigning the specimen under

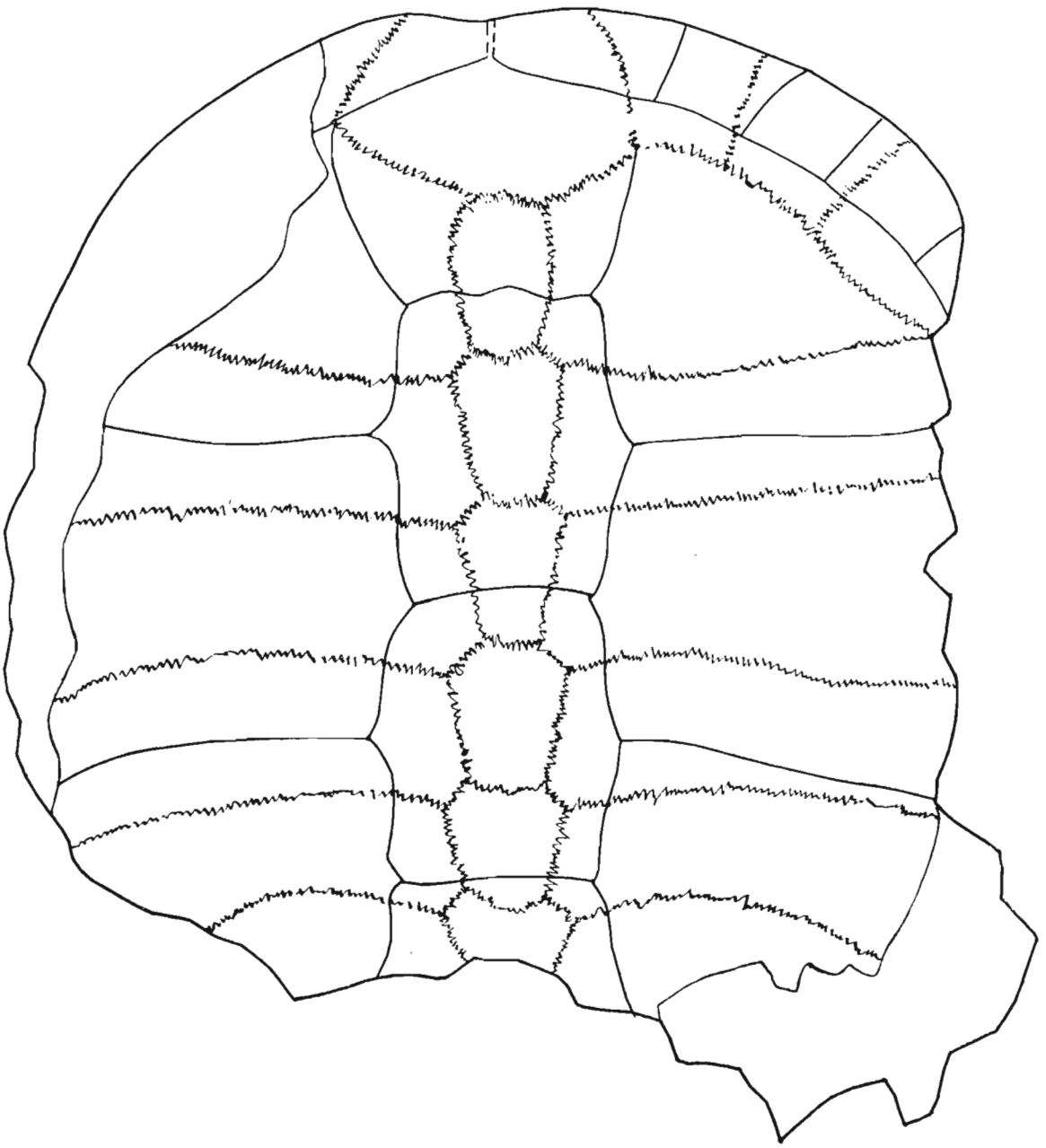

Fig. 2
Mongolemys sp., fragment of a carapace; Upper Cretaceous, Sheeregeen Gashoon, Gobi Desert (Z.Pal.No.MgCh/71); × 0.5.

study to *Mongolemys elegans*. On the other hand, the specimen described is similar to *Mongolemys elegans* in a general habitus of the shell and in the size and arrangement of plates and shields.

Genus **ZANGERLIA** MŁYNARSKI, 1972

Monotypic species: Zangerlia testudinimorpha MŁYNARSKI, 1972.
Diagnosis — see MŁYNARSKI, 1972, p. 85.

?**Zangerlia** sp.

(Text-fig. 3)

Material. — 1) A large, peripheral plate, probably Per-VII or Per-VIII, 5 cm long and 1.9 cm thick (Z.Pal.No.MgCh/74); 2) a fragmentary plastron with traces of sulcus of a large individual (Z.Pal.No.MgCh/90). Both fragments from the Upper Nemegt Beds of the locality Nemegt, Nemegt Basin, Gobi Desert.

Fig. 3
?*Zangerlia* sp., peripheral plate; Upper Cretaceous, Upper Nemegt Beds, Nemegt, Nemegt Basin, Gobi Desert (Z.Pal. No.MgCh/74); × 1.

Discussion. — Found in the locality Nemegt, these specimens are indicative of the presence of massive shells covered with a distinct sculpture characteristic of the monotypic species *Zangerlia testudinimorpha*, described from the Lower Nemegt Beds (MŁYNARSKI, 1972). At the first glance, the two fragments resemble the remains of the shells of soft-shelled turtles. Among the Dermatemydidae with an uncertain taxonomic position, a similar sculpture is met with only in the genus *Tretosternon* OWEN, so far known only from the Upper Cretaceous European marine beds (LYDEKKER, 1889). These remains also cannot belong to the representatives of the genus *Anosteira* LEIDY since the last-named have a more delicate shell, usually a finer sculpture and they have not so far been known from the Mesozoic. The only species, which invites a comparison is a terrestrial representative of the Mongolian Dermatemydidae, *Zangerlia testudinimorpha* (see MŁYNARSKI, 1972).

Family TRIONYCHIDAE BELL, 1828
Genus **TRIONYX** GEOFFROY, 1809

Type species: Trionyx triunguis (FORSKAL, 1775).
Diagnosis — see HUMMEL, 1929, pp. 11—18, and MŁYNARSKI, 1969, pp. 111–112.

Trionyx sp. **a**

Material. — An almost complete discus of a small 12 cm long individual (Z.Pal.No MgCh/76) from the Upper Nemegt Beds, Nemegt, Nemegt Basin, Gobi Desert.

Trionyx sp. **b**

Material. — 1) A few larger fragments of the discus (pleurals and neurals) of medium-sized individuals (Z.Pal.No.MgCh/80); 2) a left hyoplastron of a large, 13 cm long, individual (Z.Pal.No.MgCh/81); 3) an almost complete left hyoplastron and hypoplastron, 9.5 cm long, together with long bones of the same, not very large and probably young individual (Z.Pal.No.MgCh/83); 4) about twenty fragments of pleurals and neurals of large individuals (Z.Pal.No.MgCh/88); 5) six fragments of plastron of two individuals varying in size (Z.Pal.No. MgCh/89). All the remains are from the Upper Nemegt Beds, Nemegt, Nemegt Basin, Gobi Desert.

Discussion. — The remains of soft-shelled turtles are met with in the locality Nemegt more often than in the materials from Tsagan Khushu. There are two different forms. One of them, large *Trionyx* sp. *b* characterized by a massive structure of shell which probably reached 80 cm in length. Another, smaller one *Trionyx* sp. *a* does not exceed 15 cm in length. These small, soft-shelled turtles are characteristic of the Upper Cretaceous of the Gobi Desert. Their assignment to the genus *Trionyx* GEOFFROY in uncertain. It is not unlikely that they belong to the genus *Plastomenus* COPE, but the material available for the studies is insufficient for the reconstruction of the shell. Drawing such conclusions of the basis of the fragments preserved in this material would be absolutely premature.

INDETERMINATE MATERIAL
(Text-fig. 4)

Material. — A right peripheral plate Per-X of a not very large specimen with a strongly serrate ridge of carapace (Z.Pal.No.MgCh/88) from Upper Nemegt Beds in the northern part of the Nemegt locality, Nemegt Basin, Gobi Desert.

Fig. 4
Right peripheral plate of an unidentified specimen with strongly serrate ridge of carapace; Upper Cretaceous, Upper Nemegt Beds, Nemegt, Nemegt Basin, Gobi Desert (Z.Pal.No.MgCh/88); × 1.

Discussion. — The presence of a single, isolated plate with a sharp ridge is indicative of the occurrence in the locality under study of a so far unknown form with a strongly serrate ridge of carapace. So far, none of both the Mesozoic and Tertiary turtles collected by any of the Polish-Mongolian Palaeontological expeditions have displayed similar characters. Such a strong serration of carapace is a character representative of evolutionarily already more advanced groups of the suborder Neochelydia. Sharp terminations of peripherals are, for instance, characteristic of the representatives of the genus *Geoemyda* GRAY (subgenus *Heosemys* GRAY), but they have never before been found in the Dermatemydidae. The turtle, from the shell of which the fragment comes, was small and did not exceed 18 cm. Thus, the presence of these remains suggests the possibility of the occurrence of one more form already closely related to the Recent tortoises of the groups so far unknown from the Mesozoic, or still another representative of the Dermatemydidae which then occupied a similar ecological niche as that of the Recent representatives of the genus *Geoemyda*.

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