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NOTES ON TORTOISES (TESTUDINIDAE) FROM THE TERTIARY OF MONGOLIA

(UWAGI O ŻÓŁWIACH (TESTUDINIDAE) Z TRZECIORZĘDU MONGOLII)

(Plates VIII—IX)

Abstract. — Two tortoises are described on the basis of material collected by the Polish-Mongolian expeditions in Mongolia in 1963—1965: *Geochelone insolitus* (MATTHEW & GRANGER) from the Lower Oligocene of Ergelyeen Dzo (Ardyn Obo) and Gua Teg in the south-eastern Gobi Desert, and *Geochelone oskarkuhni* n. sp. from the Pliocene of Altan Teli in Western Mongolia. A survey of the literature on the Mongolian Tertiary Testudinidae is presented, and the systematics accepted by the author discussed briefly. A short survey of the Tertiary (mainly Asiatic) members of the genus *Geochelone* FITZINGER is offered and the suppositions concerning the phylogeny of the Mongolian species are put forwards.

INTRODUCTION

In the present paper I deal exclusively with the land species derived from Tertiary formations. They were collected during the first Polish-Mongolian Palaeontological expedition in 1963 and during the 1965 expedition. This material is not very rich and, for the most part, includes only fragments of shells of specimens varying in size. On the basis of such material, it was possible to establish the systematic position of two species.

The material from 1963 was found in the Middle Oligocene formations of Ergelyeen Dzo (Ardyn Obo) and Gua Teg (about 65 km SE from Ardyn Obo). The geological age of the first of these localities was determined by BERKEY and MORRIS (1927). Abundant and relatively well preserved remains of tortoises were collected at this first locality by American expeditions (MATTHEW & GRANGER, 1923; GILMORE, 1931). They are kept in the palaeontological collection of the American Museum of Natural History. The material collected by the Polish-Mongolian expedition in 1963 contains shell fragments of specimens, belonging to one species.

The material from 1965 was obtained from the Pliocene locality at Altan Teli (GRADZIŃSKI *et al.*, 1968, p. 75, Text-fig. 34). This locality, discovered by the USSR expedition (ROZHDESTVENSKY, 1954), abounds in remains of different mammals. They are a typical Hipparion fauna. Turtles have not hitherto been recorded from Altan Teli and known from the Pliocene formations of Mongolia. The present material consists of remains of four shells, of which we menaged to prepare only one. The fossilized surface of bony plates of these remains is strongly weathered and badly damaged mechanically. Owing to the preservation of whole shells or their large fragments together with casts, their characteristic shape can be reconstructed.

Several papers have been published on the fauna of tortoises (Testudinidae) of Mongolia. Of these, GILMORE's (1931) descriptions are particularly valuable. WIMAN (1930), BOHLIN (1953) and recently YEH HSIANG K'UEI (1963) gave special attention to the Tertiary testudinids of the Chinese part of Mongolia. Many specialists, who worked at materials from other countries and continents, e.g. GLAESSNER (1933) and BRÄM (1963), took interest in the systematic position of the tortoises in question.

The present paper is related to the revision of the systematic position of contemporary and fossil tortoises, initiated by WILLIAMS (1950, 1953) and LOVERIDGE & WILLIAMS (1957), and continued by AUFFENBERG (1963, 1964, 1966), and others, who deals with the Nearctic forms, and KHOSATSKY and me, as far as the Palearctic forms are concerned (KHOSATSKY & MŁYNARSKI, 1966; MŁYNARSKI, 1966).

During the Polish-Mongolian expedition in Mongolia, a rich material of Upper Cretaceous turtles was collected in the Nemegt Basin. Rather small fresh-water turtles from the layers of Tsagan Khushu (GRADZIŃSKI *et al.*, 1968, Text-fig. 8), are particularly numerous and well preserved. Turtles belonging to the same form had also been found before by the USSR expeditions. These remains belong to the primitive fresh-water members of the so-called „primitive Cryptodira", which stand close to the Dermatemydidae and the oldest Anosteiridae. The determination of the systematic position of these turtles will be of great importance to the establishment of the evolution of the suborder Cryptodira. This material will be the subject of later investigations.

I wish to thank Prof. Z. KIELAN-JAWOROWSKA, Director of the Palaeozoological Institute, Polish Academy of Sciences, Head of the Polish-Mongolian Expeditions, for the loan of material and permission to work it out for this volume. I am grateful to Dr. J. ŚWIECIMSKI for drawing the text-figures, to Dr. J. MAŁECKI for taking the photographs, and Mr. T. OLEŚ for preparing the material.

The specimens described in this paper are in the possession of the Palaeozoological Institute, Polish Academy of Sciences, Warsaw, for which the abbreviation *Z. Pal.* is used, see also KIELAN-JAWOROWSKA & DOVCHIN, 1968, p. 12. The abbreviation for the American Museum of Natural History is *A. M. N. H.*

SYSTEMATICS

In this paper I introduce a new systematic division of the Cryptodira, which needs a short discussion.

In this division the superfamily Testudinoidea includes only the families most advanced in morphological evolution, i.e. the Testudinidae, Ptychogastridae, Platysternidae and Emydidae. Thus the group under discussion contains the forms which other authors (ROMER, 1961; KUHN, 1964; SUKHANOV, 1964) assigned to the family Testudinidae. From this superfamily, I remove all the primitive forms, e.g. the Chelydridae, assigned to it, among other authors, by MERTENS and WERMUTH (1955).

The family Testudinidae includes only land forms, the same which most authors place in the subfamily Testudininae. Introducing such a division, I refer to the contemporary systematics presented by MERTENS and WERMUTH (1955). This division is justified, above all, by its practical consequences, because it permits the distinction of the land turtles proper from the Emydinae and Batagurinae (MCDOWELL, 1964). The detailed grounds for the acceptance of this systematic division will be presented by me elsewhere (MŁYNARSKI, 1968).

Suborder **CRYPTODIRA** Cope, 1870

Superfamily **TESTUDINOIDEA** Bauer, 1893 emend. Młynarski, 1968

(Sectio TESTUDINIDAE (part.) Mertens & Wermuth, 1955)

Family TESTUDINIDAE Gray, 1825 emend. Mertens & Wermuth, 1955

(TESTUDININAE auct.)

Genus **GEOCHELONE** Fitzinger, 1835

Type species: *Testudo stellata* Schweigger, 1872 = *Testudo elegans* Schoepff, 1795 (det. Fitzinger, 1843).

Geochelone insolitus (Matthew & Granger, 1923)

(Pl. VIII; Text-figs. 1-5)

1923. *Testudo insolitus* n. sp.; W. D. Matthew & W. Granger, The fauna ..., p. 5.
1931. *Testudo insolitus* Matthew & Granger; C. W. Gilmore, Fossil turtles..., pp. 232-236, Text-figs. 11-15; Pl. 5; Pl. 5; Pl. 8, fig. 1.
1931. *Testudo demissa* n. sp.,; C. W. Gilmore, *Ibidem*, pp. 239-241, Text-figs. 18-19.
1933. *Testudo insolitus* Matthew & Granger; F. N. Glaessner, Die Schildkröten. ..., p. 238.
1951. *Testudo insolitus* Matthew & Granger; H. Bräm, Testudo cf. stehlini ..., p. 439.
1964. *Testudo insolitus* Matthew & Granger; O. Kuhn, Fossilium Catalogus ..., p. 87.

Holotype (cotype): Fragments of three median peripherals, a posterior peripheral, a distal portion of a third pleural plate and two left hyoplastra (A. M. N.H. No. 6275).

Type horizon and locality: Lower Oligocene, Ardyn Obo formation; Ergelyeen Dzo (= Ardyn Obo), SE Gobi.

Diagnosis. — A large land species with a carapace strongly convex. Bony plates thick and massive; sculpture of shields indistinct or quite invisible. The sulci of lateral shields on the surface of the pleural plates are narrow grooves with raised edges. Praecentrale large, flattened, as if pressed into proneurale [1]. Neurals tetra-, octa- and hexagonal; pygals and metaneurals unknown. Plastron large, stout, with broad bridge; plastral lobes immobile. The poorly thickened epiplastra do not form fossa epiplastralis, the gular region is not projected. The entoplastron is not crossed by the humeropectoral sulcus, the pectorals are narrow, narrower than the other plates of the plastron. The anals have characteristic lateral edges, which are directed caudad; the anal notch is small. Skull and skeletal bones unknown. Shell length to about 650 mm.

Material. — 1) A large fragment of a plastron including hyo-, hypo- and xiphiplastra, belonging to a big specimen (Z. Pal. No. MgCh/ 11); 2) fragments of a plastron and carapace probably of one big specimen with the left part of proneural, large fragments of neurals and peripherals (11 fragments all together) (Z. Pal. No. MgCh/ 4); 3) fragment of a pleural of a far smaller specimen (Z. Pal. No. MgCh/ 3); 4) numerous small fragments of the shell of a large specimen of Gua Teg, totally detached during the transport. The fragment of xiphiplastra with bent edges of these specimen is worthy of note (Z. Pal. No. MgCh/ 5).

[1] The names of plates and shields after Staesche (1961).

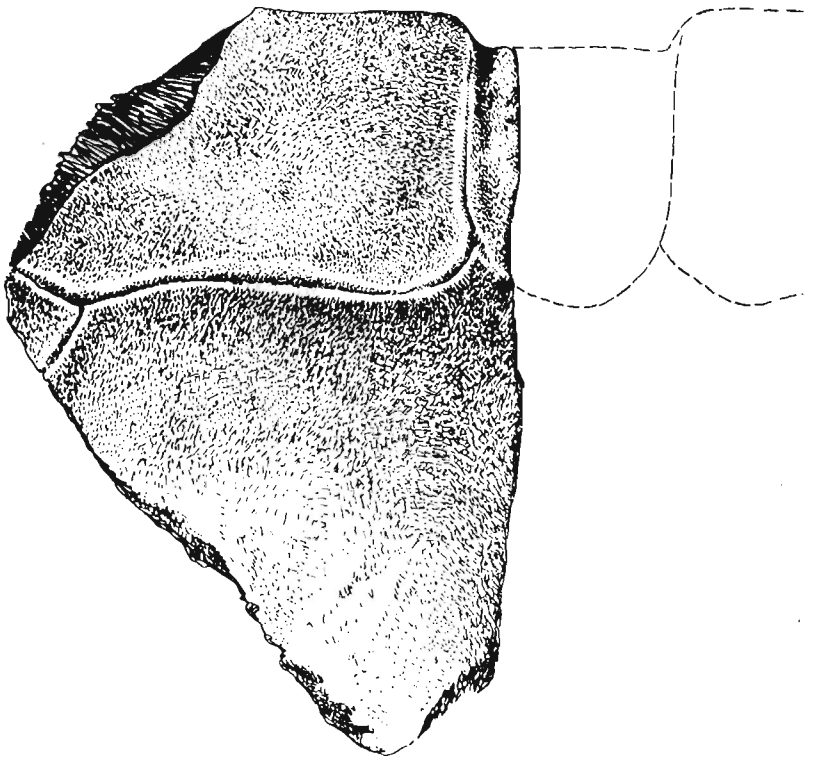

Fig. 1. *Geochelone insolitus* (MATTHEW & GRANGER) from Ergelyeen Dzo, Lower Oligocene: a fragment of the proneural plate (Z. Pal. No. MgCh/ 4); approx. ×0.75.

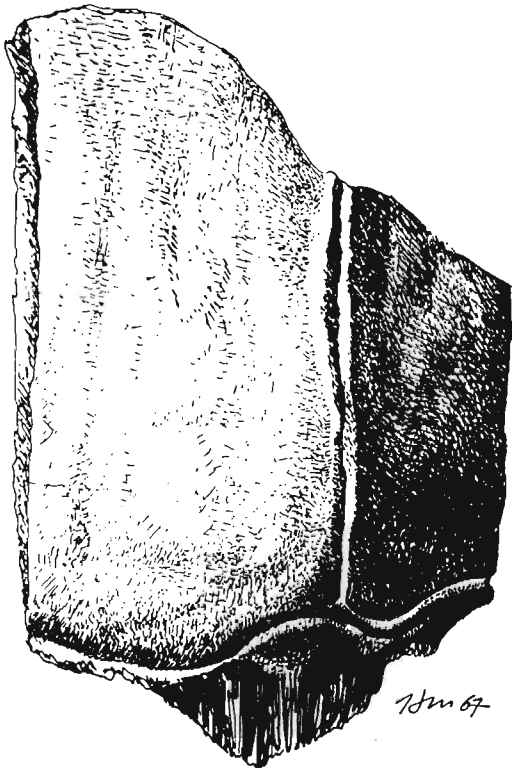

Fig. 2. *Geochelone insolitus* (MATTHEW & GRANGER) from Ergelyeen Dzo, Lower Oligocene: a fragment of the pleural plate (Z. Pal. No. MgCh/ 4); approx. ×0.75.

Description. — In this material the almost complete plastron of a large specimen (No. 11) clains special attention. This fragment is 550 mm long and, measured in the pontal portion of the hyoplastra, 370 mm wide. The thickness of plates reaches 50 mm here. Shield sulci can be seen well on the surface of the plates, whereas sculpturing is hardly marked. The sutures

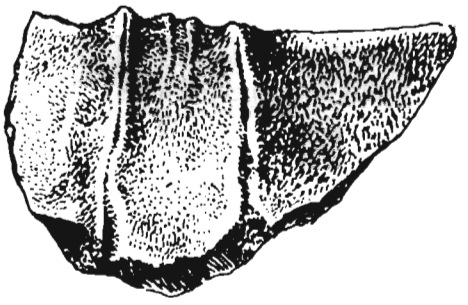

Fig. 3
Geochelone insolitus (MATTHEW & GRANGER) from Ergelyeen Dzo, Lower Oligocene: a fragment of proneurale with the praecentral shield (Z. Pal. No. MgCh/ 3); nat. size.

which join the plates are visible but less distinct. There are no traces of any loose, mobile junctions of particular plastral elements. The bridge is broad and it was joined with well-developed buttresses. A very characteristic anal notch of the xiphiplastra occurs in our remains; it allowed the animal to lower its tail more downwards during copulation or egg laying. However, it cannot

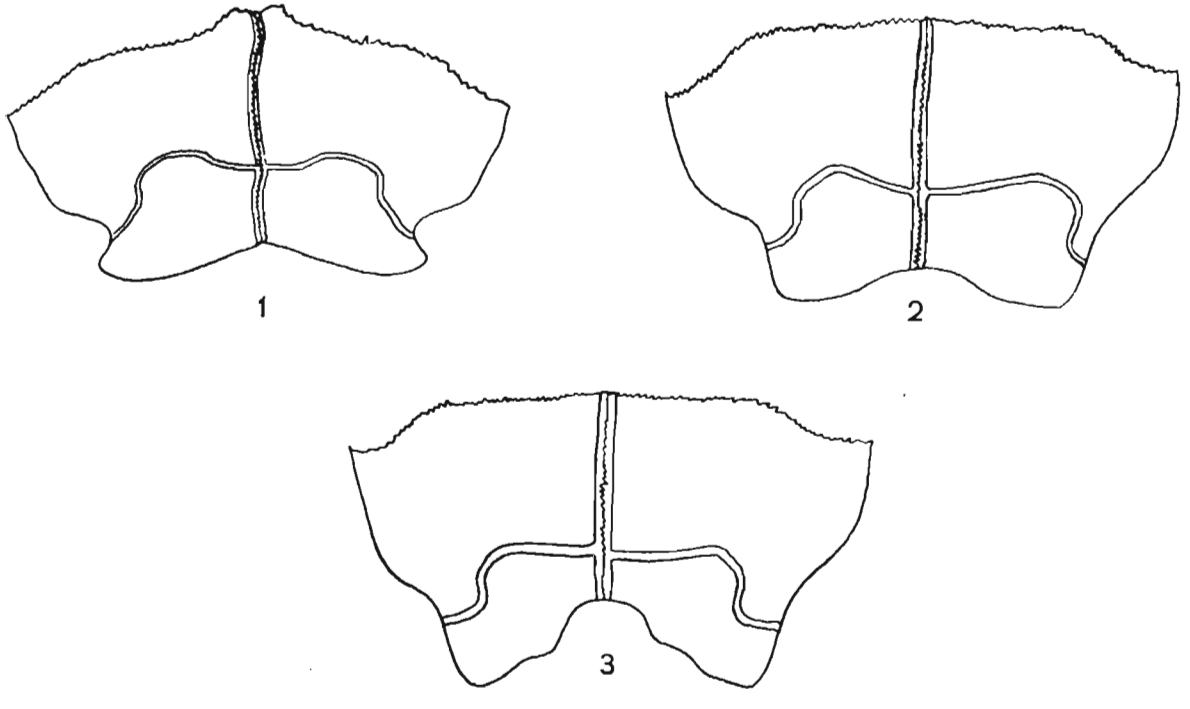

Fig. 4
Geochelone insolitus (MATTHEW & GRANGER), individual variationof the xiphiplastra: *1* — holotype *Testudo demissa* Gilmore from Lower Oligocene of Ergelyeen Dzo (A. M. N. H. No. 6670), *2* — specimen from Gua Teg, Lower Oligocene (Z. Pal. No. MgCh/ 5), *3* — specimen from Ergelyeen Dzo, Lower Oligocene (Z. Pal. No. MgCh/ 11); approx. ×0.5.

be found for certain, whether these remains represent a male or a female, because there is no conspicuous concavity of the medial portion of the plastron. In large testudinids such a concavity is usually distinct and deep in males, though, being a secondary sexual character, it may undergo fluctuations and even, in some cases, be absent at all. There is no notch of this type in contemporary species, but, as has appeared, it is not a distinctive character of this species. In Z. Pal. No. MgCh/5 the anal notch is triangular, typical of most members of the genus *Geochelone*. The remains from American collections (holotype *Testudo demissa* GILMORE) have very small anal notches. In this last specimen, as in our remains No. 5, the anal portion of the xiphiplastra is bent strongly downwards.

The shape of the plastral shield can be reconstructed on the basis of the well-preserved sulci. Special attention should be given to the relatively narrow pectorals and to the anals, with their lateral edges directed caudad, in the characteristic manner of this species. The arrangement and shape of these shields in our specimens is the same as in those from American collections.

In our material the fragments of the proneural (nuchal) are well preserved, which makes the reconstruction of the shape of the whole plate possible. In one specimen (Z. Pal. No. MgCh/5) the impression of the whole praecentral shields has been preserved (Text-fig. 3). This is relatively broad as for a member of the genus *Geochelone* and as if pressed into the surface of the proneural in a peculiar manner. This plate is identical with those in American specimens.

It is also worth while to give attention to large fragments of the pleurals, with sulci characteristic of this species, the laterals and peripherals, typical of large testudinis.

Discussion. — I include the species under study in the genus *Geochelone* FITZINGER (sensu LOVERIDGE & WILLIAMS, 1957, pp. 221—225) on the basis of the structure of its plastron, which does not even show any traces of mobile joints. This species has no visible characters of the member of the genus *Testudo* LINNAEUS, from which it also differs in size. *G. insolitus* (MATTHEW & GRANGER) rather resembles the contemporary members of the subgenus *Aldabrachelys* LOVERIDGE & WILLIAMS. No similar Asiatic fossil forms have been recorded so far. There is some general likeness of the form being discussed to Lower Oligocene *Geochelone ammon* (ANDREWS) from Fâjum in Egipt (ANDREWS, 1906). Both these turtles are of similar size and have similar narrow pectorals, typical of the younger members and most of the contemporary members of this genus. *G. ammon* has also a well-developed praecentral shield, but it differs completely in its structure of the gular region of the plastron.

GILMORE (1931, pp. 239—242) described a new species, *Testudo demissa*, from the same geological layers, on the basis of the xiphiplastrals of a large specimen with characteristic, very strongly bent edges (*l. c.*, p. 240, Text-figs. 18—19). He regards the shape of this part of the plastron as a specific character. Taking into consideration the fact that GILMORE (*l. c.*) had only one fragment of the plastron (A. M. N. H. No. 6670) at his disposal, and on account of great individual variation in the structure of the anal part of the xiphiplastra in *G. insolitus* found in our material, I include *T. demissa* into synonymy of this last species (see Synonyms p. 87). The identical and, in this case, very characteristic shape of the anal shields indicates that *T. demissa* is synonymous with *G. insolitus*. I consider the shape of these shields to be one of the taxonomic characters.

Such great variation in the structure of the anal portion of the xiphiplastra is rather an isolated phenomenon in tortoises and may be one of the characters of *G. insolitus*. It may well be that here we have to do with sexual characters. The morphological divergencies in this part of the plastron are symmetrical and regular in nature and, as happened in the case of *T. demissa*, they may lead into error if the material used is scanty. Thus, it is another example that

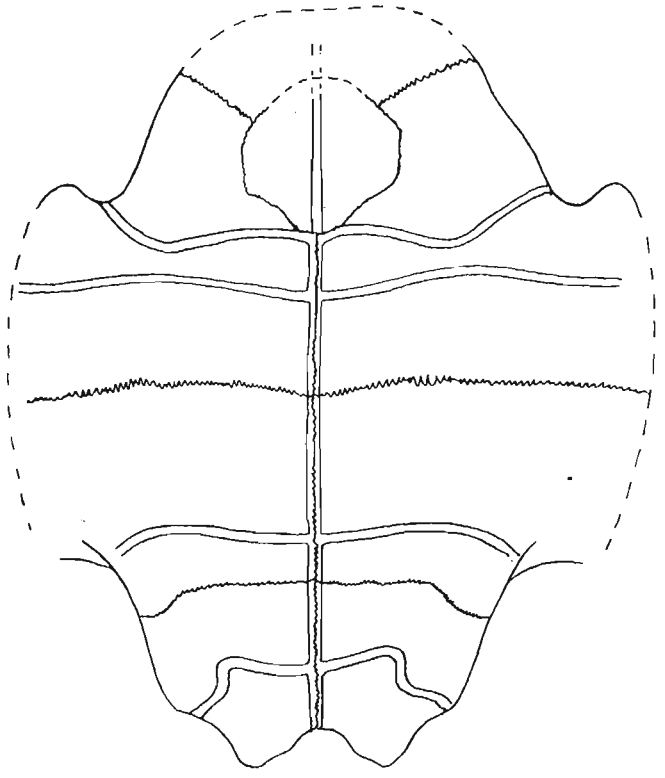

Fig. 5
Geochelone insolitus (MATTHEW & GRANGER), Lower Oligocene of Ergelyeen Dzo and Gua Teg: reconstruction of the plastron; approx. ×0.25.

illustrates, how the characters of an individual may be taken for taxonomic characters of a species or genus (MŁYNARSKI, 1956).

The whole plastron has been reconstructed on the basis of Z. Pal. No. MgCh/11 and GILMORE's material (1931, p. 233, Text-fig. 12; p. 235, Text-fig. 15). In the reconstruction the anal notch is shown as in Z. Pal. No. MgCh/5, this shape being supposedly typical of most of the specimens.

Geochelone oskarkuhni n. sp.

(Pl. IX; Text-figs. 6-8)

Holotype: A plastron and a pygal portion of the carapace of the same individual (Z. Pal. No. MgCh/ 15).
Type horizon and locality: Pliocene (GRADZIŃSKI *et al.*, 1968, p. 75); Altan Teli, Dzereg Valley, Western Mongolia.
Derivation of the name: *oskarkuhni* — in honour of Professor OSKAR KUHN, Münich, Germany.

Diagnosis. — A small land species with a very strongly vaulted carapace, which has a characteristic conical shape, distinctly steep in the pygal region. Shields with visible sculpturing, separated by deep and clear sulci. Plastron broad, without mobile joints of plates. Gular region of plastron very clearly narrowed, epiplastral lips thick and fossa epiplastralis large and deep. Entoplastron large, distinctly elongated, without humeropectoral sulcus; anal notch triangular. Pectoral shields very narrow, much narrower than other shields of plastron. Gular region of

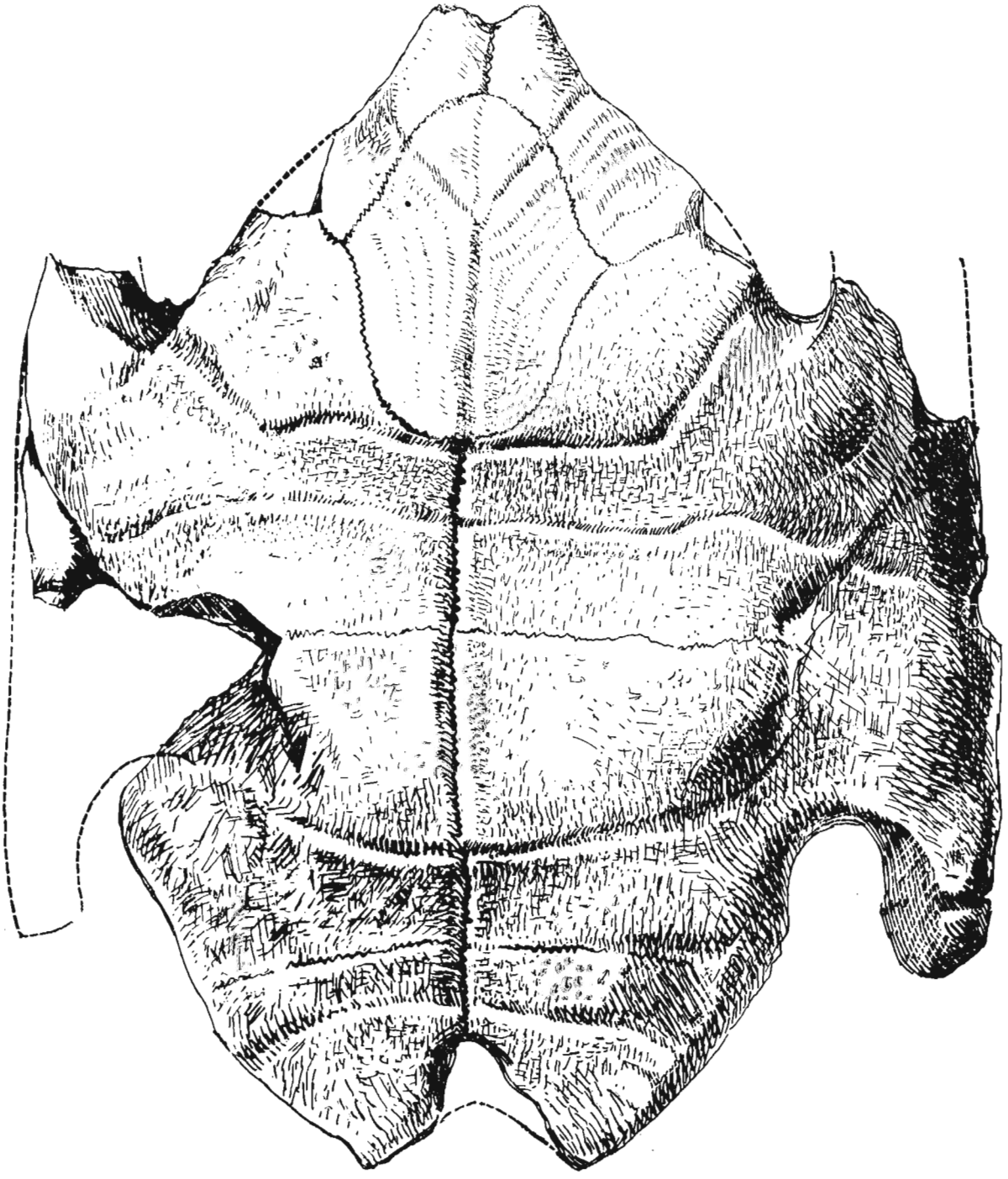

Fig. 6
Geochelone oskarkuhni n. sp., Pliocene of Altan Teli: a schematic drawing of the plastron (holotype, Z. Pal. No. MgCh/15); nat. size.

carapace with two metaneurals and one postcentral, typical of the members of the genus. Praecentral shield narrow but distinct. Skeleton unknown. Length up to 220 mm.

Material. — A fragment of the carapace and plastron of the same specimen (holotype), Z. Pal. No. MgCh/15; a very badly damaged and unprepared fragment of the pygal portion of the carapace, with the plastron and cast of the same specimen, Z. Pal. No. MgCh/16; a cast and fragments of the plastron and carapace, with badly worn surfaces, of one specimen, Z. Pal. No. MgCh/17; larger but badly damaged fragments of plates of the shell, which have no taxonomic value, Z. Pal. No. MgCh/18—20.

Description. — As has already been mentioned, the material from Altan Teli is poorly preserved. The surface of the shell plates in all the specimens is heavily weathered and mechanically damaged. Only in specimen No. 15 it was possible to trace and restore the course of the sulci of shields and the sutures of plates, whereas in the remaining specimens practically nothing but the general shape of the plastron and carapace has been preserved. The remains of the specimen, which was distinguished as the holotype, were extracted from the cast, which was destroyed on the occasion of this operation. In spite of heavy damages and cracks, these remains allowed the restoration of the shape of the nearly whole plastron and the pygal portion of the carapace. These details, for the most part, invisible in the photograph, are shown in Text-figs. 6—7. This is a semi-diagrammatic drawing with a partial reconstruction. The great

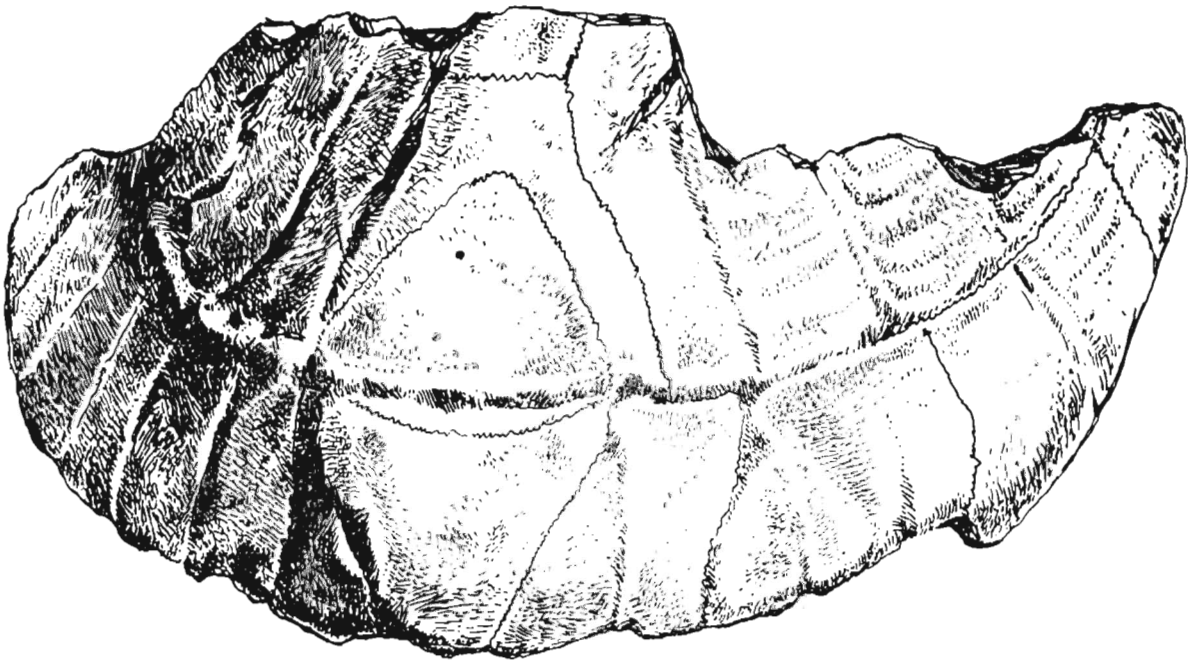

Fig. 7
Geochelone oskarkuhni n. sp., Pliocene of Altan Teli: pygal part of the carapace (holotype, Z. Pal. No. MgCh/ 15); nat. size.

damages and cracks of the surface of the plastron have been left out or only slightly marked in it. The bony sutures, which are ill-seen in the original, mostly worse seen than the cracks of the plates, are presented distinct on purpose, and so are the sulci of the shields and their sculpturing.

It may be assumed on the basis of general morphological resemblance that our material represents the shells of several individuals, belonging to one and the same species. They are marked by their small measurements: the plastral length of the holotype is 180 mm, and the length of the shell in Z. Pal. No. MgCh/17 about 220 mm.

The plastron is sturdy, broad and joined with the carapace by a wide bridge. The plastral elements are united very strongly and show no traces of mobile joints. The gular portion of the anterior lobe is clearly narrowed. The epiplastra are very stout and the thick epiplastral lips surround the very distinct and deep fossa epiplastralis. The posterior lobe is broad, broader than the anterior one, and has a small triangular anal notch, typical of most testudinids. The noteworthy large and elongated entoplastron occupies the nearly whole medial portion of the anterior lobe. It can be seen only in the holotype, and even then with the help of a magnifying glass, because its edges are hardly discernible on the badly damaged surface. The mechanical damages visible in Pl. VIII resemble the outlines of a small entoplastron at first sight. For this reason, the cracks and scratches have been left out in the simplified semi-diagrammatic drawing (Text-fig. 6).

The gular shields are elongated and cover a large part of the entoplastral surface. The pectoral shields are narrow, far narrower than the remaining shields of the plastron, whereas the anal ones have slightly arcuate sulci, like those in most small testudinids. The axillars and inguinals were probably small, but the injury of the pontal portion of the plastron makes it impossible to restore their shape.

The carapace is very distinctly and strongly domed in the pygal region and it slopes mildly down craniad. The well-preserved whole casts allowed the drawing of the silhouette of the shell, as seen from a side, to show its characteristic shape (Text-fig. 8).

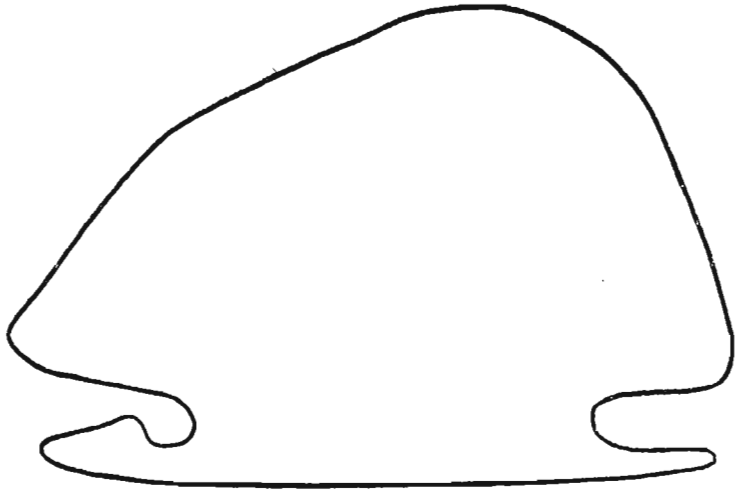

Fig. 8

Geochelone oskarkuhni n. sp., Pliocene of Altan Teli: a lateral section of the shell; approx. ×0.5.

The surface of the plates is weakly but clearly sculptured. The narrow praecentral shield is present (Z. Pal. No. MgCh/16). The morphology of the medial part cannot be reconstructed, since its surface is greatly damaged or destroyed, but the pygal region is well-preserved. Here there are two metaneural plates; the anterior larger, bifurcating posteriorly to embrace the smaller posterior element, which is crossed near its middle by the sulcus between the fifth central and the postcentral.

Discussion. — I reckon this species in the genus *Geochelone* on the basis of the morphology of the pygal region of the carapace. Apart from some individual divergencies, it is shaped similarly to the corresponding region in the post-Eocene forms of this genus (LOVERIDGE & WILLIAMS, 1957, p. 217, Fig. 12*B*). The structure of the plastron, that of its anterior lobe, and the lack of any mobile elements also refer it to this genus.

For this new form I have erected a new species, based on characters, easily discernible even in badly damaged specimens, i.e. 1) the characteristic, strongly domed shape of the carapace, and 2) the structure of the anterior lobe of the plastron (gular region, entoplastron). These characters distinguish this form from the fossil testudinids of Mongolia and China (GILMORE, 1931; WIMAN, 1930; BOHLIN, 1953; YEH HSIANG K'UEI, 1963).

Geochelone oskarkuhni is similar and seems to be close to the Pliocene species *Geochelone hipparionum* (WIMAN), described by WIMAN (1930) from the Hipparion Red Clays in Northern China. A large and valuable collection of perfectly well-preserved specimens of this species is in the possession of the Institute of Vertebrate Palaeontology of Academia Sinica (YEH HSIANG K'UEI, 1963, Pl. 9, fig. 5; Pl. 10, figs. 3—4; Pl. 11, figs. 4—5; Pl. 13, figs. 1—3). The specimen, presented in this publication in Pl. 13, figs. 2—3, shows particularly great likeness in structure of the plastron to our species, from which it, however, differs in its less conspicuously domed carapace, relatively broader pectorals and larger praecentral.

Both WIMAN (1930) and YEH HSIANG K'UEI (1963) include *G. hipparionum* in the genus *Testudo* LINNAEUS. On the basis of the good illustrations offered by these authors, this species may, to a certainty, be referred to the genus *Geochelone*.

G. oskarkuhni is very similar, above all, in the structure of the gular region of its plastron, to *G. shaerica* (WIMAN) described by WIMAN (1930) together with the previous species from the Hipparion Red Clays of North China. Nevertheless, it seems to me that not only these two species, but also several others described by WIMAN (*l. c.*) from the same Chinese layers, ought to be regarded as members of one species. If the great morphological variation of the structure of the shell in the testudinids is allowed for, then the differences between these turtles are really slight. Besides, in the same area there are not, as a rule, more than one or two testudinid species of similar size and belonging to close morphological groups.

Another form similar to *G. oskarkuhni* is *Geochelone kegenica* (KHOSATSKY) from the Neogene (Upper Miocene?) formations of Tienshan in Kasakhstan (KHOSATSKY, 1953; 1958), though it differs from *G. oskarkuhni* in its greatly sculptured surface of the tile-like shields of the carapace, unnarrowed gular region of the plastron and broader pectorals (BASHANOV & PIGULEVSKY, 1955, p. 89, Text-fig. 1).

THE SYSTEMATIC POSITION OF THE MONGOLIAN TESTUDINIDAE

On the basis of the forms described and discussed in the present paper and those presented by GILMORE (1931), it may be stated as follows:

1. No true fossil members of the genus *Testudo* are known from Mongolia; all the terrestrial species described so far can be numbered in the genus *Geochelone* sensu LOVERIDGE & WILLIAMS (1957).

2. At present it would be difficult to classify the species discussed in subgenera, but no doubt, they do belong to several groups, which represent different evolutionary trends.

The following groups can be distinguished:

A) The oldest of the forms described, *G. ulanensis* (GILMORE) recorded by GILMORE (1931, pp. 245—247) from the Upper Eocene of Ulan Shirah shows primitive characters of Eocene species. Owing to very poor and non-characteristic material, it is hardly possible to compare it with other species.

B) *Geochelone insolitus* (MATTHEW & GRANGER) from the Lower Oligocene of Ardyn Obo and Gua Teg, is the largest terrestrial species so far known from Mongolia. It differs distinctly from all the contemporary and fossil "giant" turtles and perhaps represents a separate lateral evolutionary line. It is only apparently similar to the members of the subgenus *Aldabrachelys*. Neither has it anything in common with the members of the genus *Stylemys* LEIDY (WILLIAMS, 1952, p. 557).

C) The systematic position of *Geochelone kaisini* (GILMORE) from Ardyn Obo and *G. nanus* (GILMORE) from the Oligocene of East Mesa, Twin Oboas, is not clear. In both these forms, absent from our material, the entoplastron is crossed by the humeropectoral sulcus, as in the contemporary species of the subgenus *Indotestudo* LINDHOLM. In spite of this distinct common character, these two turtles differ from each other in a number of other characters, namely in shape, size, structure of the plastron, etc. *G. kaisini* was described from only one specimen and it cannot be ruled out decidedly that they are simply remains of *G. insolitus*, which, as has been demonstrated above, shows a great tendency to develop morphological divergencies. *G. nanus* is a small form, somewhat similar to *G. oskarkuhni*, among other things, in its large entoplastron, which occupies the medial portion of the anterior lobe. This form is obviously different from all the members of the subgenus *Indotestudo* and represents quite a lateral line of small steppe-desert forms.

D) *G. oskarkuhni* belongs to a group of small Asiatic members of *Geochelone*, widely distributed in the Upper Tertiary. It might be called the *hipparionum*-group after its typical representative, *G. hipparionum*. As late as the beginning of the Pleistocene, these turtles inhabited the vast areas of Central and North-eastern Asia and, perhaps, reached up to Europe. In America, a similar position in this period was held by the species of the subgenus *Caudochelys* (AUFFENBERG, 1963), which lived under quite similar ecological conditions in Florida. It is a surprising fact that these forms died out completely both in Asia and in America. As has already been mentioned, the members of this group probably occurred also in Europe in that period. Here, however, as early as the Miocene there appeared the members of the genus *Testudo*. They were ancestral forms to the contemporary Grecian tortoise of the so-called *antiquagraeca*-group and the forms of a still unestablished position, as if intermediate between *Geochelone* and *Testudo* (MŁYNARSKI, 1966, pp. 259—261).

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PLATES

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PLATE VIII

Page

Geochelone insolitus (MATTHEW & GRANGER) 87
(Ergelyeen Dzo, Lower Oligocene)

Fig. 1. The plastron (Z. Pal. No. MgCh/11); ×0.4

Photo: J. Malecki

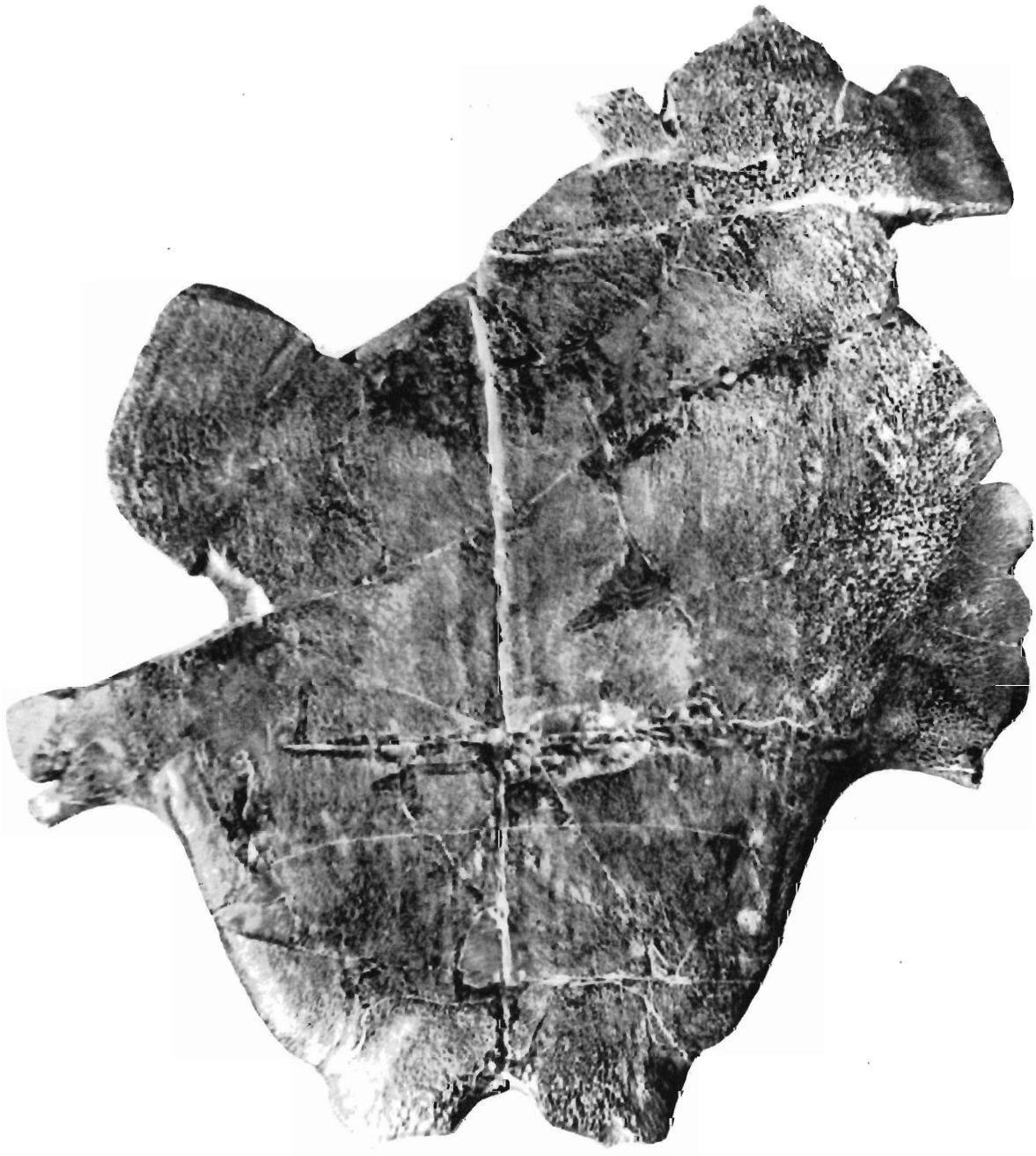

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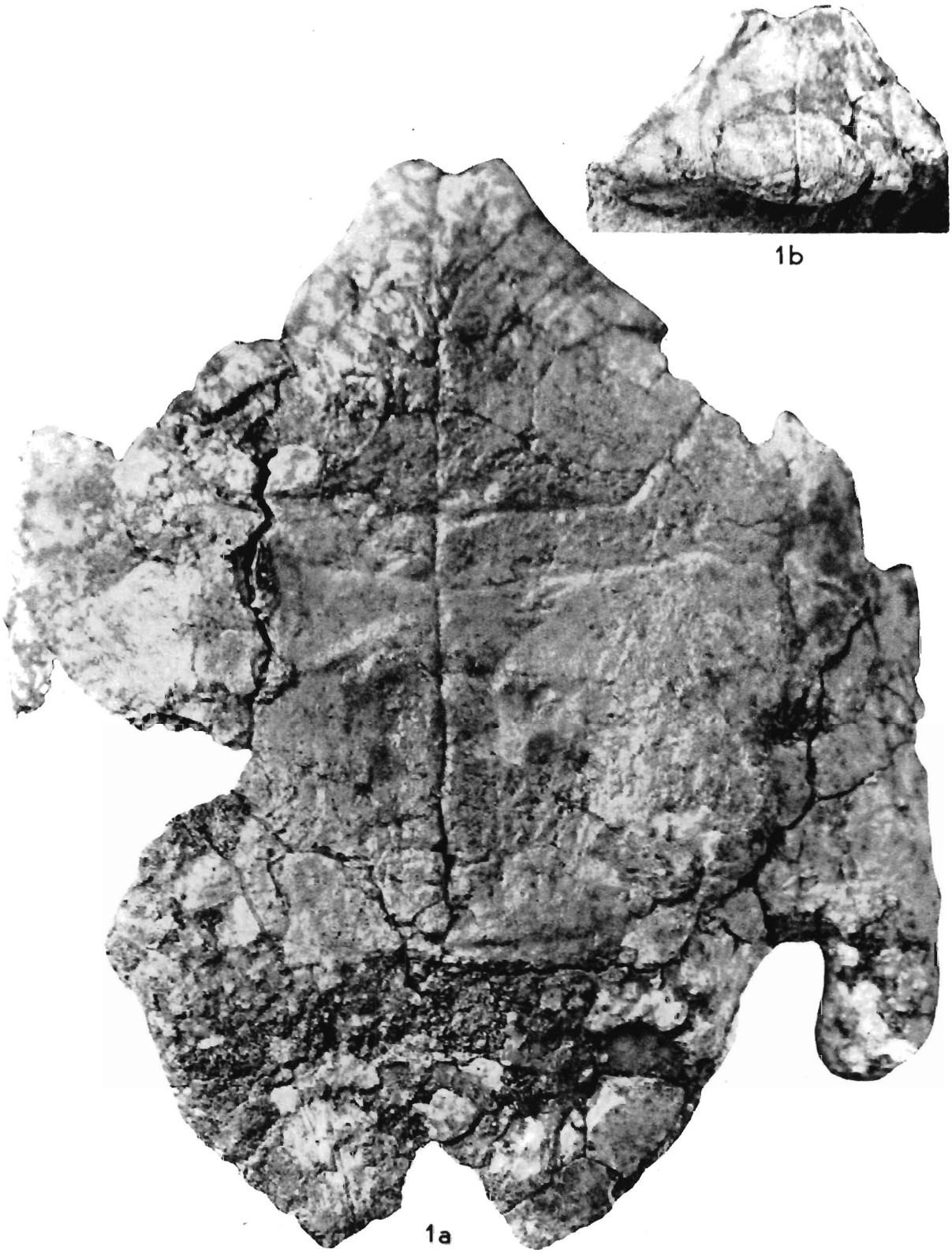
PLATE IX

Fig. 1. The plastron of the holotype specimen; ×0.75

Fig. 2. Internal view of the plastron of the holotype specimen; ×0.75

Photo: J. Malecki



1b

1a

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