

A NEW TURTLE-LIKE REPTILE FROM MONGOLIA

Of the numerous discoveries of different dinosaurs and turtles recovered by the Mongolian Paleontological Expedition of the USSR Academy of Sciences in 1918 in the Nemegt Valley, the remains of a giant, turtle-like reptile (fig. 1) from the Upper Cretaceous deposits deserves special recognition. The remains just recovered were in the so-called fifth quarry, near the skeleton of a large carnivorous dinosaur. The dinosaur skeleton just extracted was without any partially well preserved bones and which does not include the remains of the new reptile are not considerably broken ribs and limb bones (a metacarpal and 3 portions of manual claws). The basic parts of the bony skeleton of the turtle-like reptile are incomplete, evidently deposited towards the excavation or in the greater depth of it, and the rest are in the shallower [portions of it].

Further searching in its location strongly affirms new information of this exceptionally important find, representing a huge scientific interest and the first discovered appearance of this type of reptile in the world.

The general length of the ill-preserved portion of rib (fig. 2) is an even 1.23m, its width on the dorsal end — 9cm, the middle portion — 10cm, and the ventral end — 8cm.

The anterior¹ region of the rib is very thick, thin in the rear, consequently having some asymmetry. The dorsal end's thickness is 2.5cm, the ventral — 8mm. The dorsal end of the rib in diameter shows a T-shaped section in outline, in the middle portion — a triangular form, in the lower — an unequal oval form. Onto the side of the dorsal parts of the ribs are preserved some *fyestoni*² (bony forming regions), indicating a well developed intercostal musculature.

On the length and width of the ribs, between estimates of compression of the form of the animal's body and its great width, that is very reminiscent of the structure of the giant sea turtle genera *Protostega* and *Archelon*, reaching 3.5m in length and 2m in greatest breadth. The entire region of the dorsal portions of the reptile's ribs are not small, at 1.5m. Such shape, taking into account the size of the spine, the general width of the animal is around 3.1-3.25m. The width of the giant sea turtle genus *Archelon*, from the Cretaceous sediments of North America are and average 2.2-2.3m. Apparently, in comparison, the new turtle-like reptile of the Cretaceous deposits of central Asia exceeds by more than 1 m the width of the giant sea turtles.

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The length of the reptile's massive metacarpal bone is 27cm. Its proximal end is wide and thickened. The vertical

¹ may be better read as "dorsal" or "proximal."

² I cannot find a translation of this word; I assume it to be, as in contextual form, a term referring to the rough-texture of a tendinous or ligamental attachment.



Fig. 1. *Therizinosaurus*, external view.

reconstructed by K.K. Fierova

diameter is 2cm, and more so mediolaterally³. The bone's middle portion is narrow. The dorsal surface is remarkably somewhat roughened, with a short, low crest. The distal end is less thickened and has a cylindrical joint surface for articulation with the first manual phalanx, indicative of its great mobility. The unguis phalanges are long, sickle-like in form, and very narrow and tall (fig. 3). The dorsal area of the phalanx is ovate ventrally — very nearly sharpened in its anterior part. The somewhat broken phalanx as composed is generally long at 52cm, the whole phalanx apparently not less than 60-65cm. On the side of the phalanx, at the level of the lower third of its height, situates a well-defined groove which would have accommodated prominent blood vessels *mitavshiy*⁴ keratin covering the huge claw. The proximal portions of the claw are thick. It end has several⁵ circular pits for articulation with the preceding manual phalanx. Its joint surface slopes steeply from the midline on both sides. The purpose of such a surface is limited to the laterally divided claw, which serves an important function by movement, and acquiring food. Below the shallow hollows of the joint is found a massive bony knob with a pitted surface. To this is fastened an extraordinarily powerful bone-bending tendon.

The massive metacarpal bone and the giant unguis phalanges show that the derived forelimb is nearly transformed into powerful swimming organs. The forelimb has long, grooved sickle-like unguis. Concluding in a tip with a keratinous sheath, they may have been originally used by the animal for cutting aquatic vegetation or for another function, constrained by movement and acquiring food.

³ literally, "diametrically" or "from side to side."

⁴ I cannot translate this word; I assume it refers to the context of the unguis keratin sheath. It may also be written as "*vitavshiy*."

⁵ also, "many."

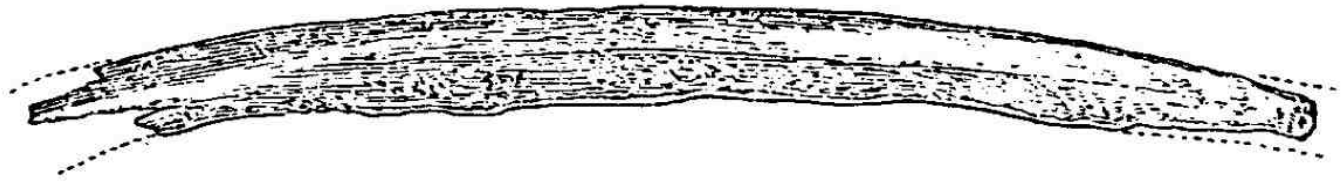


Fig. 2. *Therizinosaurus*. Rib in ventral aspect.

drawn by N.B. Siyekova

Such great, developed claws have not till now been observed in the environments of vertebrate animals. Its exceptional and extraordinary case is observed for the first time.

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Comparison of the incomplete remains of the turtle-like reptile with early well-known reptiles expose close similarities with the giant sea turtle family of *Protostega*, especially with *Archelon ischyros* (Weiland, 1896) and *Protostega gigas* (Cope, 1872), with which it is united by general characters in the structure of the body and form of the ribs. Such similarities are able to generate a result in a general existence of relation.

However, the absence of a coastal element of the rib, form and size of the manual claws, the great difference in the length is very distinct, which shows a complete basic appearance of the Mongolian form in a new family of turtle-like reptiles from Central Asia, *Therizinosauridae*, for the present with a single genus, *Therizinosaurus* (therizinosaur) and species, *cheloniformis*[§]. These reptiles are characterized by a broad, compressed body, nearly derived forelimbs, trenchant and huge claws, and barely developed or almost completely absent bony armor.

The gigantic turtle-like reptiles of Central Asia represent a highly original group of ancient reptiles. They reached 3.5-4.5m long and their greatest width at 3m (average length of the body of *Therizinosaurus* is 4.5m, the width at 3.25m). The entire lineage of the reptiles is especially linked with the gigantic sea turtles of the Upper Cretaceous of Europe and North America. Here first appears relatively reduced armor, increased body size, and measurements of the fore- and hindlimbs.

Structural changes in the limbs and form of the armor relate the reptile to living in an aquatic environment: the animal does not have heavy armor, with a nearly enlarged body and is capable of deep diving.

The armor develops gradually very flattened then in large or small degrees is reduced or nearly vanishes. The defensive role of armor passes on to the ribs, which are of a widely covered, highly compressed form. The forelimb is increased in size; the claws are well stretched and takes a sickle-like shape.

The discovery of the remains of the turtle-like reptile in the Gobi Desert along with the remains of sauropods, trachodonts⁶, and carnivorous dinosaurs does not likely

contradict the pronouncement, or, on the other hand, speaks of a great variety and widespread aquatic reptiles in the Upper Cretaceous world.

The turtle-like reptile is similar to the giant sea turtles of Europe and North America, settling the coastal sea zones, washing the shores of Central Asia.

The shallow continental shores tells of numerous ingresses of riverbeds, reaching from 2 to 5 km greater in transverse, capable of strongly representing a marine fauna in a continental deltaic region, where are found discoveries of an essential condition and abundance. Except for that, the force of the channel in the time period may occur to bring in the appearance of remains of a single individual or group of animals.



Fig. 3. *Therizinosaurus*. Claw from the side.

drawn by N.B. Siyekova

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[citations in the paper were not given; they are included below for completeness' sake.]

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Weiland, G.R. 1896. *Archelon ischyros*: a new gigantic cryptodire testudinate from the Fort Pierre Cretaceous of South Dakota. *American Journal of Science (4 series)* 2: 399-412.

[§] *Therizinosaurus* — scythe lizard, *cheloniformis* — turtle-like.

⁶ archaic reference to hadrosaurs. *Trachodon mirabilis*, upon which the group "trachodonts" is based on, is no longer considered a valid species referable more generally than

Hadrosauridae, which is considered to be more valid than the technically older term *Trachodontidae*, given *T. mirabilis* is generally referred to *Hadrosauridae*.

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