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JEŽOVKY RODU PYGASTER Z ČESKÉHO ÚTVARU KŘÍDOVÉHO
THE GENUS PYGASTER (ECHINOIDS) FROM THE CRETACEOUS ROCKS
IN BOHEMIA

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VLASTISLAV ZÁZVORKA:

Ježovky rodu *Pygaster* z českého útvaru křídového

The Genus *Pygaster* (Echinoids) from the Cretaceous Rocks in Bohemia

(Předloženo 8. IV. 1949.)

Jižně od obce Uhelná Příbram (list Chrudim — 4055) v jihovýchodních Čechách, našel spolu s jinou křídovou faunou pan odborný učitel Otto NEVOLE z Chotěboře dva exempláře fosilních ježovek, náležející rodu *Pygaster*. Podrobným studiem bylo zjištěno, že oba kusy možno přiřadit ke druhu *Pygaster truncatus* AGASSIZ, přesto, že ani jeden z nálezů není dokonale zachován. Oba exempláře jsou neúplné a následkem toho není možno některé znaky zjistit. Jednoho exempláře je jenom polovina. Druhý exemplář obdržel jsem později. Je to skoro celá schránka, porušená však do značné míry na zadní části periproctu až k ambitu. Peristom je skoro úplně zakryt horninou. Povrch schránky je značně korodován. Jen málo bradavek zůstalo celých. Skoro všechny jsou vylomeny nebo korosí vypleptány a místo nich vidíme jamky uprostřed pravidelného, kruhovitěho valu, obklopujícího dvůrek.

Schránka je subcyklická, s poněkud utátným ambitem na zadní straně pod řitním otvorem, který je supramarginální.

Celá společnost fauny, spolu s oběma uvedenými exempláři druhu *Pygaster truncatus* AGASSIZ, byla nalezena ve vápencích, t. j. v litorálních uloženinách spodnoturonského stáří jižně od Uhelny Příbramě, v úžlabí mezi rulovými kopcí Hochštejnem (526 m n. m.) po jz. straně a Kobylou (535 m n. m.) po jv. straně. Původně byla v těchto místech obecní louka a pastviště. Nyní je tam vysázena smrková kultura. Zkameněliny jsou ze spodní části 3—4 m hlubokého výkopu pro potrubí vodovodu.

Po prvé na tato místa upozornil Dr. Ant. CULEK (1940), který tam v odvodňovací strouze našel rozpadlé písčité slíny. Výkopem byla CUL-

KOVA pozorování potvrzena a nalezené společenstvo živočišstva umožnilo přesné stratigrafické zhodnocení odkrytého obzoru.

První, nedokonale zachovaný exemplář zástupce rodu *Pygaster* uvedl z české křídy Otomar NOVÁK od Přemyšlení.

Kromě české křídy jsou H. B. GEINITZEM uvedeny nálezy z cenomanu s Plauenscher Hügel-u a od Coschütz v Sasku, COTTEAU a TRIGER je uvádí od Codrecieux (dép. Sarthe) a Ile-d'Aix, Fouras (dép. Sarthe). J. S. SMISER uvedl tento druh z cenomanu (Tourtia de Tournai) od Tournai v Belgii.

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Representatives of the genus *Pygaster* are very rare in the Cretaceous in Bohemia. Only three specimens belonging to this genus are known up till now from Bohemia. The preservation of all three specimens is very imperfect and incomplete. Thus their specific position was rather difficult to determine. It was only the second specimen from Uhelná Příbram (SE of Bohemia) that made possible the determination of the species.

One of the finds from the Cretaceous rocks of Bohemia is a specimen which was described and figured already by the Czech paleontologist Otomar NOVÁK in his monograph on the Echinoids from the Cretaceous rocks of Bohemia. The second specimen was found by Otto NEVOLE from Chotěboř together with other remains of an Upper Cretaceous marine fauna. The specimen was found in autumn 1947 in the rocks dug out at the laying of the pipes for the communal water-supply near Uhelná Příbram (sheet Chrudim — No. 4055 of the Topographic Map).

The rocks, in which these fossils were found, are Lower Turonian marly conglomerates. They are deposits in a zone moulded by the strong surf of the Cenomanian and especially Lower Turonian sea.

Occurrence: A shallow channel south of Uhelná Příbram, between the gneissic hills Hochštejn (526 m. above sea level) on the SW and Kobyla (535 m. above sea level) on the SE. Originally there was at that place a village meadow and pasture, but now a spruce forest has been planted here. The fossils are from the lower portion of an excavation, 3—4 m. deep.

The first to draw attention to this locality was A. CULEK (1940). He discovered here decomposed sandy marls in a ditch. Now CULEK's observation has been confirmed by excavation.

Besides the remains of other animals also the representatives of the genus *Pygaster* were obtained here from the immediate vicinity of the former rocky sea coast. A complete list of the fossils from this locality is given in another paper. In the present paper I give only a fuller report of the results of the investigation of the finds of the remains of *Echinoids*.

It is necessary to emphasize that while some of the features of the first specimen from Uhelná Příbram are very marked and very easy to follow, others cannot be observed at all because of the fragmentariness of the find.

The second specimen, which I obtained later, is a nearly complete corona, but damaged to a large extent on the posterior portion of the periproct up to the ambitus. The peristome is almost entirely covered by the rock. The test (surface) of the corona is very corroded. There remain but few whole tubercles. Almost all are broken off or etched by corrosion. Instead of the tubercles we see little pits in the centre of a regular circular rampart.

The corona is subcircular, of pentagonal contour and truncated on the posterior face under the supramarginal periproct. In the broken specimen, whose corona is considerably flattened and in the centre of the ventral surface around the peristome concave, are visible the following ambulacra only: anterior (1), anterolateral (2), and posterolateral (3), all of them incomplete and, further, two incomplete interambulacra of the right portion of the corona. On the more complete specimen may be observed all five ambulacra. The features observed on the incomplete specimen are here confirmed.

The upper surface is slightly inflated and towards the apex rather flat.

The lower margin of the ambitus is considerably rounded and passes quickly into the lower face.

The lower face is considerably flat, in the centre somewhat concave. As far as can be observed the peristome has distinct incisions.

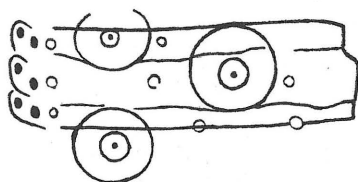
The ambulacra are slightly, almost imperceptibly inflated. The anterior ambulacra are straight, and they are passing distinctly rectilinearly from the apex to the peristome. The posterior ambulacra are slightly curved in consequence of the very developed supramarginal periproct. On the specimens that we have, only a fragment adjoining the apex is preserved in the more complete specimen.

While at the anterior ambulacral areas both meridional rows of plates are equally broad, at the posterior ambulacral area of the incompletely preserved specimen we can clearly observe that the inner rows of the plates are considerably narrower than both their outer rows.

The poriferous zones are very narrow. They are composed of small, rounded, densely accumulated pore-pairs. The pore-pairs in each area at the apex are placed horizontally. But the more the pore-pairs approach to the ambitus, the more does their connecting line become oblique.

To every pore-pair belongs one ambulacral plate. Because the ambulacral pore-pairs are very densely crowded, the corresponding ambulacral plates are very narrow and elongated.

The tubercles, which are rather large in comparison with the plates, are developed without regard to the border of the individual plates, and each tubercle occupies the breadth of two neighbouring plates.



Pygaster truncatus AGASSIZ.

Destičky zadního sloupce pravého předního ambulakrálního pruhu. Podle exempláře od Uhelné Příbramě. Spodní turon. Plates of the posterior row of the right antero-lateral ambulacral area. After the specimen from Uhelná Příbram. Lower Turonian.

Every ambulacral area contains four zones of tubercles, that is two alternating rows on each row of plates. The rows bordering the zones of ambulacral pores are stronger than the inner rows. Also only these outer rows of tubercles reach the apex, whereas the inner rows peter out. The inner rows peter out also before reaching the peristome and there remains only one marginal row on either side.

Further the much larger interambulacral plates bear longitudinal rows of alternating tubercles. These tubercles are, however, a little larger than the tubercles of the ambulacral areas. Whereas at the ambitus there are usually up to 5 or 6 rows of tubercles on each zone of plates, i. e. 10—12 tubercles on each interambulacra, their number decreases to one at the apex and peristome. The row which persists is the strongest, middle, that is third row from the outer margin of the ambulacrum. Thus also in the ambulacra only two rows of tubercles reach the apex. The tubercles of the ventral surface are a little larger than those of the upper surface. The sixth row of tubercles, inserted at the ambitus between the ambulacral pores and the marginal row of the tubercles, disappears suddenly above the ambitus.

The tubercles are small, globular, perforate, noncrenulate. They are excentric in a narrow, but sharply marked areola. The areola is fringed by a ring of unequal, sometimes tubercle-like granules, sometimes arranged in hexagonal patterns.

The incomplete and comparatively very badly preserved specimen from the Cenomanian limestone from Přemyšlení (village in Central Bohemia) designated and figured by Otomar NOVÁK as *Pygaster* sp., reaches a breadth of 50 mm., a height of 25 mm. The approximate size of the fragments from the Lower Turonian beds from Uhelná Příbram are as follows: larger and more complete specimen — oblique breadth 34,4 mm., antero-posterior breadth 30,6 mm.; height 15,5 mm.; smaller, incomplete specimen — oblique breadth approximately 29,5 mm., height approximately 14 mm.

It is evident from a consideration of all features here listed that the finds from the Lower Turonian beds from Uhelná Příbram should be placed in the species *Pygaster truncatus* GEIN. In the same species

should probably also be placed the specimen from Přemyšlení which O. NOVÁK, because of its imperfect preservation and for want of features, designates only as *Pygaster* sp.

Besides the specimens from the Cretaceous from Bohemia H. B. GEINITZ recorded finds from Untere Pläner (sandy marl and marl) from Plauenscher Hügel and especially from Coschütz from the Saxon Cretaceous. GEINITZ determined these finds as *Pygaster truncatus* AGASSIZ. All statements made by GEINITZ agree with placing them in this genus and perhaps also in this species, but GEINITZ expressly states that the tubercles are non-perforated and on plate 18, fig. 3 A they are also figured as non-perforated. This may, however, be a mistake or due to fossilisation. Perhaps it will be necessary to re-determine the finds from the Saxon Cretaceous and to place them in another species. I think it nevertheless very probable that the finds recorded by GEINITZ belong to the genus *Pygaster*, as they agree with this genus in all other features.

COTTEAU and TRIGER in their work "Echinides du département de la Sarthe", 1855—1869, record *Pygaster truncatus* AGASSIZ from the Cenomanian from Codrecieux (dép. Sarthe) and also from the Cenomanian at Ile-d'Aix, Fouras (Charente-Inf.).

J. S. SMISER in "A Monograph of the Cretaceous Echinoids" describes and figures this species from the Cenomanian (Tourtia de Tournai) at Tournai, Belgium.

The specimen recorded by Otomar NOVÁK from Přemyšlení would be stratigraphically equivalent to other finds made in Cenomanian beds.

The specimens from Uhelná Příbram are a little younger, of Lower Turonian age.

I greatly regret that the foreign literature on the subject is so incompletely represented in our libraries as to make a thorough, scientific study of the Bohemian finds impossible.

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Pygaster truncatus Agassiz.

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| <p>1. Spodní strana. Spodní turon. Uhelňá Příbram. Akc. č. 31.170. 2×</p> <p>2. Svrchní strana. Spodní turon. Uhelňá Příbram. Akc. č. 31.170. 2×</p> <p>3. Svrchní strana porušeného exempláře. Spodní turon. Uhelňá Příbram. Akc. č. 31.168. 2×</p> <p>4. Svrchní strana neúplného exempláře. Orig. Ot. Novák, 1888, tab. II., obr. 4. (Pygaster sp.). Cenoman. Přemýšlení. Poněkud zvětšeno.</p> <p>5. Svrchní strana. Cenoman (Tourtia de Tournai). Tournai, Belgie. Kopie podle J. S. Smiser-a, tab. 3, obr. 4a.</p> <p>6. Pohled od zadu. Totéž. Kopie podle J. S. Smiser-a, tab. 3, obr. 4c.</p> <p>7. Spodní strana. Totéž. Kopie podle J. S. Smiser-a, tab. 3, obr. 4b.</p> <p>8. Pohled se strany. Totéž. Kopie podle J. S. Smiser-a, tab. 3, obr. 4d.</p> | <p>1. Lower surface. Lower Turonian. Uhelňá Příbram. No. 31.170. 2×</p> <p>2. Upper surface. Lower Turonian. Uhelňá Příbram. No. 31.170. 2×</p> <p>3. Upper surface of a broken specimen. Lower Turonian. Uhelňá Příbram. No. 31.168. 2×</p> <p>4. Upper surface of an incompletely preserved specimen. Orig. Ot. Novák, 1888, pl. II, fig. 4 (Pygaster sp.). Cenomanian. Přemýšlení. Slightly enlarged.</p> <p>5. Upper surface. Cenomanian (Tourtia de Tournai). Tournai, Belgium. Copy after J. S. SMISER, pl. 3, fig. 4a.</p> <p>6. Posterior view. The same. Copy after J. S. Smiser, pl. 3, fig. 4c.</p> <p>7. Lower surface. The same. Copy after J. S. Smiser, pl. 3, fig. 4b.</p> <p>8. Side view. The same. Copy after J. S. Smiser, pl. 3, fig. 4d.</p> |
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Exempláře 1, 3, 4 jsou uloženy ve sbírkách geologicko-paleontologického oddělení Národního musea v Praze.

The specimens 1, 3, 4 have been deposited in the collections of the Geologico-Palaeontological Division of the National Museum, Praha.

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