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A REVISION OF THE ORDOVICIAN TRILOBITE GENUS BATHYCHEILUS HOLUB

ABSTRACT. *Bathycheilus* Holub, 1908 is redescribed using topotype material from the Llanvirn Series of Bohemia. In addition to the type-species a new species is described from the Arenig Series of south-western France. The subfamily *Bathycheilinae* PŘIBYL is raised to familial status, synonymous with *Pharostomatidae* HUPÉ, and in it are placed both *Prionocheilus* ROUAULT, 1847 and the type genus *Bathycheilus*.

In 1872 Barrande (p. 32) described a fragmentary trilobite from the Ordovician rocks of Bohemia as a new species *Dalmanites perplexus*. The type-specimen, a cast of which is figured here, comprises a thorax of twelve segments with the frontal portion of the attached pygidium and a fragment of the cephalon. The last-named exhibits most of a large genal spine, not the right as shown by Barrande whose illustration, as is often the case for older publications, is in the form of a mirror image. The calymenid affinities of the species were not recognized until 1908 when Holub made it the type of a new genus *Bathycheilus* and figured additional material. Since then sporadic references to *Bathycheilus perplexus* have been made, but no satisfactory description or photographs have been published. I am indebted to Dr. V. Zázvorka of the Národní Museum, Prague for supplying me with a cast of Barrande's holotype as well as loaning additional topotypes, whilst Professor W. F. Whittard has kindly read the manuscript.

Class TRILOBITA

Superfamily CALYMENACEA EDWARDS, 1843

Family BATHYCHEILIDAE PŘIBYL, 1953

(*nom. transl.* herein ex *Bathycheilinae* PŘIBYL, 1953)

Syn. PHAROSTOMATIDAE HUPÉ, 1953.

Emended diagnosis of family. Glabellar outline parabolic or bell-shaped, with three pairs unequal lobes decreasing in size forwards. Axial furrows widen posteriorly opposite basal glabellar lobes to contain pair of subelliptical paraglabellar areas smaller than those found typically in homalonotid trilobites. Gently inclined, rounded or slightly flattened anterior border separated from glabella by narrow (*sag.*), flat preglabellar field. Eyes sited opposite second or third glabellar lobes. Eye-ridges

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generally present but may be only weakly developed. Facial suture opisthoparian, with genal angles produced backwards to form pair of long librigenal spines. Anterior half or so of each librigena sometimes equipped with row of small, vertical spines along ventral surface and extending frontally across anterior border of rostral plate. Thorax with twelve or thirteen segments. Pygidium of typical calymenid type.

Genus *BATHYCHEILUS* HOLUB, 1908

Type species. *Dalmanites perplexus* BARRANDE, 1872 by original designation.

Diagnosis. Cephalon subsemicircular in plan with short, upturned anterior border which is continued anterolaterally. Glabella bell-shaped or subtrapezoidal in plan, tapering anteriorly, with three pairs unequal glabellar lobes diminishing in size forwards. Fixigenae strongly convex extending forwards beyond front of glabella. Facial suture opisthoparian. Genal angles produced backwards into pair of long, stout, librigenal spines. Surface of cephalon mostly coarsely granulated, often with rows of tubercles traversing glabella between each pair of glabellar lobes. Thorax with twelve segments.

Bathycheilus perplexus (Barrande)

Pl. 1, figs. 1-10

1872. *Dalmanites perplexus* Barrande, p. 32, pl. 13, fig. 23.
1908a. *Bathycheilus perplexus* (Barrande), Holub, p. 13, pl. 1, figs. 3-6.
1908b. *Bathycheilus perplexus* (Barrande), Holub, p. 4, pl. 1, figs. 3-6.
1953. *Bathycheilus perplexus* (Barrande), Přibyl, p. 28.
1956. *Bathycheilus perplexus* (Barrande), Thadeu, pp. 16, 28, pl. 7, figs. 1-3, pl. 8, figs. 1, 2.
1958. *Bathycheilus perplexus* (Barrande), Havlíček et al., p. 32.

Description. The cephalon is strongly convex both transversely and longitudinally, its outline subsemicircular, well rounded anterolaterally, but less so frontally. Maximum breadth, measured across the pleuroccipital furrow, is rather more than twice the median length. The glabella, occupying rather more than one-third the maximum cephalic breadth, is moderately convex and subtrapezoidal in plan, so that the frontal breadth is about half that of the base. The sides of the glabella are moderately convergent forwards as far as the third glabellar furrows, but then become less convergent to the front of the glabella. There are three pairs of glabellar lobes and furrows, ending in line adaxially so as to leave a smooth median band slightly more than one-third of the glabellar breadth. The third glabellar lobes occupy about one-third of the length of the glabella; they expand in size abaxially, where they are bluntly pointed anterolaterally and well rounded posterolaterally. The third glabellar furrows are deep and broad (*exsag.*), directed inwards and moderately backwards. The second glabellar lobes are subrectangular in plan, about one-fifth the length of the glabella, defined anteriorly by straight second glabellar furrows which are only lightly impressed and parallel to the third furrows. The first glabellar lobes are similar in shape to the second lobes but slightly smaller, whilst the first glabellar furrows are straight and only faintly developed, though apparently extend-

ing to the axial furrows. The frontal glabellar lobe is subtrapezoidal in outline, more than twice as broad as long, narrowing forwards slightly and with the frontal margin only gently convex forwards. The axial furrows are broad frontally, narrowing towards their mid-points, opposite the second glabellar furrows, where the inner margin of the fixigena forms a structure generally similar to the "buttress" described by Shirley (1936), from such genera as *Calymene* sensu stricto and *Diacalymene*. Thence the axial furrows broaden backwards markedly to meet the pleuroccipital furrows and form a pair of elongated, subtriangular, depressed spaces in each of which a small, elongated, paraglabellar area is sited [see Pl. 1, fig. 10]. Each paraglabellar area is semielliptical in plan, its length about three-quarters that of the adjacent third glabellar lobe, defined adaxially by the axial furrow and abaxially by a shallow, curved furrow. In consequence of the unusual form of the axial furrows the cheeks have a somewhat curious appearance. An impression of this was given by Holub (1908a, pl. 1, fig. 3a), though his generalized and exaggerated drawing did not indicate the true state of affairs. The drawing does, however, emphasize the large frontal breadth of the fixigenae, as well as their marked extension forwards in front of the frontal glabellar lobe. The portion of the fixigena bordering the paraglabellar area is steeply declined adaxially and divided from the remainder of the cheek by a conspicuous ridge. This runs from the axial furrow, opposite the second glabellar furrow, backwards and outwards in a more or less straight line until it merges with the anterior margin of the pleuroccipital furrow at the fulcrum and immediately behind the palpebral lobe. There is a suggestion of a low eye-ridge extending in a straight line from the axial furrow, opposite the mid-point of the frontal glabellar lobe, to the anterior part of the palpebral lobe. The front of the cephalon is incompletely preserved in the material examined, but the evidence suggests that the anterior border is probably low and upturned, continuing anterolaterally to form a rim around that part of the cephalon. Frontally the border is separated from the glabella by a small preglabellar field which is gently concave dorsally and slightly shorter (*sag.*) than the frontal glabellar lobe. The preglabellar field is set lower than the glabella, with a shallow preglabellar furrow separating the two, and laterally it lengthens (*exsag.*) a little, merging imperceptibly into the anterior parts of the axial furrows.

The occipital ring is parallelsided and transversely straight over its median third, but laterally curves gently forwards and narrows slightly. The median portion of the occipital furrow is broad (*sag.*) and shallow, but laterally deepens and becomes narrower owing to the development of a pair of large apodemes. The pleuroccipital furrow is shallow, moderately broad (*exsag.*) and transversely straight immediately outside the axial furrows but soon begins to curve gently backwards. The pleuroccipital furrow deepens and becomes broader at the fulcrum, curving backwards more strongly and becoming shallower beyond them, though its entire course is not known. The pleuroccipital segment is at first narrow (*exsag.*) and transversely straight, parallel to the pleuroccipital furrow, but then begins to curve backwards, particularly beyond the fulcrum, and

at the same time become broader. The genal angles curve backwards strongly to form a pair of large, broad, librigenal spines. Those of the holotype are not completely preserved but extend backwards until at least level with the front of the pygidium. The fixigenae are large and swollen, standing almost as high as the glabella, their highest points situated in front of centre, approximately opposite the first glabellar lobes. In plan they are almost subtriangular, narrowing backwards conspicuously owing to the presence of the paraglabellar areas already described. The palpebral lobes are sited relatively far back, opposite the third glabellar furrows and the anterior part of the third glabellar lobes. The visual surface of the eyes is unknown. The available evidence suggests a poorly-developed eye-platform.

The facial suture is opisthoparian. The anterior branches are only slightly convergent forwards from the eyes until they nearly reach the anterior border furrow, when they turn through almost a right-angle to converge frontally. The posterior branches run abaxially from the eyes, subparallel to the pleurooccipital furrow and arched forwards slightly, finally curving backwards and slightly inwards to cut the posterior margin of the cephalon approximately mid-way between the fulcra and the lateral cephalic margins.

The hypostoma is not known.

The thorax consists of twelve segments of calymenid type. The axis occupies just over one-third of the breadth, and each axial ring ends abaxially in a pair of occipital lobes, widely divergent forwards and delimited frontally by a pair of apodemes. Each pleura turns down through almost a right-angle at the fulcrum, and a pleural furrow, commencing at the axial furrow, runs straight outwards and slightly backwards, ending without reaching the pleural tip. Each pleura is thus divided into two pleural bands, of which the anterior is the smaller, whilst the anterolateral portion of the pleural tip is angular and the posterolateral portion rounded.

The pygidium is of general calymenid aspect, the median length (with the axis held horizontally) being just over three-quarters of the maximum breadth. The dorsal surface of the pygidium is convex transversely, whilst that of the axis is straight and moderately declined posteriorly. The axis is straight-sided, in the form of an isosceles triangle, occupying frontally just over one-third the maximum breadth. In addition to the articulating half-ring there are twelve axial rings and a small, well-defined terminal piece which stands above the side-lobes. The last-named are moderately declined abaxially and each comprises eight, well-defined pleural ribs with a ninth, less conspicuous pair. The pleural furrows are convex forwards, becoming progressively more strongly directed backwards until those separating the eighth and ninth pairs of pleural ribs are scarcely divergent backwards.

The surface of the test is inadequately known, but the evidence, mainly from the internal moulds, suggests that much of it was granulated, particularly on the cheeks, and perhaps also on the thorax; external moulds of the cephalic doublure, both frontally and laterally, are almost smooth.

Holotype. The specimen illustrated by Barrande (1872, pl. 13, fig. 23) and now in the Národní Museum, Prague. A cast of this specimen is refigured (Pl. 1, figs. 4, 7, 8). ČD 377.

Figured material. Národní Museum ČD 379 (Pl. 1, figs. 1, 5, 6, 10); ČD 380 (Pl. 1, figs. 2, 3, 9). Both specimens are preserved as internal moulds.

Horizon and localities. Barrande's holotype was said to be from the "environs de Wosek", and the additional specimens now figured are from Osek (= Vosek or Wosek), near Rokycany. The strata from which they were obtained are the Šárka Beds, generally regarded as being of Llanvirn age, and *Bathycheilus perplexus* has been recorded from this horizon by Havlíček and others (1958, p. 32).

For convenience the discussion of *B. perplexus* is combined with that of *B. gallicus* later in this paper.

Bathycheilus gallicus sp. nov.

Pl. 2, figs. 1-9.

Diagnosis. Small species of *Bathycheilus* with eyes situated high on cheeks, opposite second glabellar lobes and furrows, and only short distance laterally from axial furrows. Surface of glabella typically coarsely granulated with three transverse rows of tubercles linking the pairs of glabellar lobes. Thorax of twelve segments. Pygidium with at least six axial rings and six pairs of pleural ribs, the latter mostly poorly defined but becoming sharper at pygidial margin.

Description. The complete exoskeleton is suboval in plan, the length being rather less than two-thirds of the maximum breadth, measured across the pleurooccipital furrow. The cephalon is strongly convex, both longitudinally and transversely, with median length about five-twelfths of the maximum breadth. The cephalic outline, excluding the librigenal spines, is subsemicircular, slightly flattened frontally but well rounded anterolaterally. The convex glabella is almost as broad as long, its outline subtrapezoidal with almost straight sides converging frontally at about forty degrees. There are three pairs of unequal glabellar lobes. The third glabellar lobes are subcircular in plan, becoming subangular anterolaterally, each connected to the median lobe by a narrow "neck" which is depressed by a broad, shallow longitudinal furrow. The third glabellar furrows are deep and broad (*exsag.*), directed adaxially backwards from the furrows and ending opposite the midpoints of the third lobes. The second glabellar lobes are about half the size of the third pair and subrectangular in plan with their long axes widely divergent forwards. The second glabellar furrows are short (*tr.*), appearing only as notches in the adaxial margins of the axial furrows lobes which are shorter (*tr.*) and less distinct than the second lobes. Each pair of glabellar lobes is linked by a transverse, ring-like ridge, particularly well developed between the third lobes and carrying several conspicuous tubercles. The axial furrows are deep and slightly curved, concave outwards and deepening to both front and back. They are conspicuously wider opposite the third glabellar lobes and furrows where they contain a pair of poorly-defined, semielliptical, paraglabellar areas.

The frontal glabellar lobe is small and short, about one-fifth of the glabellar length, with anterior margin slightly convex forwards. In front of the moderately deep preglabellar furrow the preglabellar field and anterior border form a single continuous structure, steeply upturned to form a slightly thickened brim which is strongly arched transversely. The anterior border continues laterally as a thickened lateral border, whilst the furrow separating it from the glabella is continued likewise as a narrower lateral border furrow. The occipital ring is longest (*sag.*) and parallelsided medially, shortening (*exsag.*) distally to form a pair of poorlydefined occipital lobes directed anterolaterally. Between the occipital ring and the glabella, the transverse occipital furrow is well defined medially and deepens distally where a pair of apodemes is sited. The pleuroccipital furrow is deepest and transversely straight for a short distance outside the axial furrows as far as the fulcra, but then becomes shallower and curves backwards slightly to meet the lateral border furrows. The pleuroccipital segment is parallelsided as far as the fulcra but then lengthens (*exsag.*) and finally merges with a pair of stout librigenal spines. The latter are long, equal to almost twice the median length of the cephalon and extending level with the pygidium, their outer margins longitudinally straight but the inner margins directed posterolaterally. The dorsal surface of the spines is steeply declined abaxially. The fixigenae are large, extending forwards beyond the front of the glabella, and strongly inflated with the eyes situated at their apices. The proximal halves are moderately declined to the axial furrows, but the larger, distal halves decline steeply towards the lateral border furrows. The eyes have not been observed in their entirety, but are prominently sited about one-third of the distance from the axial furrows to the lateral margins and opposite the second glabellar furrows and lobes. In Pl. 2, fig. 9 they appear farther back owing to the angle at which the photograph was taken, as well as to slight crushing of the specimen. The palpebral lobes are smooth, strongly convex abaxially in plan, and steeply declined adaxially. The visual surfaces have not been found preserved, but there are no eye-platforms separating them from the librigenae, which are plump and decline steeply to the lateral border. The anterior branches of the facial suture diverge slightly from the eyes, but just before reaching the lateral border furrow they curve inwards, cutting the anterior border and then running just below the top of it to meet frontally (see Pl. 2, figs. 8, 9). The posterior branches are directed slightly backwards at first, but when only a short distance from the lateral border furrow they curve sharply back to cut the posterior margin of the cephalon.

With the exception of the furrows, all of which are smooth, the surface of the cephalon is covered with granules, sometimes fairly coarse, interspersed with larger tubercles. The sculpture of the glabella is unusual, comprising a granulated surface overlain by three transverse rows of tubercles which, as noted earlier, connect and ornament the pairs of glabellar lobes. In some individuals (for example Pl. 2, fig. 3) this type of ornamentation is less strongly developed. Coarse granules cover the surface of the cheeks, occipital ring and most of the pleuroccipital segment but become more dispersed towards the cephalic border and the

almost smooth librigenal spines. The anterior border is coarsely granulated frontally, becoming more finely granulated anterolaterally.

The hypostoma has not been found, and the underside of the cephalon is imperfectly known.

The thorax is of typical calymenid aspect. The figured paratype (Pl. 2, fig. 1) shows eleven segments but is slightly disarticulated with a small gap after the third segment. A fragmentary specimen, In. 58720, from the same locality as the holotype, shows, however, that the normal complement is twelve segments, as in *Bathyscheilus perplexus*. The axis occupies about one-third of the breadth of the thorax and is moderately convex, standing well above the side lobes. The median three-fifths of each axial ring are transversely straight, but the ring ends distally in a pair of axial lobes, directed anterolaterally and each with an apodeme immediately in front of it. The pleurae are transversely straight and parallelsided for about half their length (*tr.*), but upon reaching the fulcra they turn down sharply and curve backwards slightly to the pleural tips which are angular anteriorly and rounded posteriorly. Each pleura carries a broad, shallow, pleural furrow which, beginning at the anterior margin where it meets the axial furrow, runs abaxially and slightly backwards, being mid-way across the pleura at the fulcrum. Beyond the fulcrum it becomes deeper and narrower, almost slit-like, and then curves gently forwards, ending without attaining the pleural tip.

The outline of the pygidium is of the "taut bow" type so characteristic of calymenid trilobites and the median length, excluding the articulating half-ring, is equal to five-eighths of the maximum breadth. When viewed with the pygidial axis horizontal (see Pl. 2, fig. 4) the frontal margin is arched forwards strongly, meeting the straight, widely-divergent, lateral margins well behind centre of the pygidium. Frontally the axis occupies one-third the maximum pygidial breadth, is straight-sided and tapers gently backwards, ending just short of the tip of the pygidium. The axis is transversely convex and stands well above the side-lobes, from which it is separated by moderately impressed, straight, axial furrows. There are at least six axial rings, occupying the anterior three-quarters of the length of the axis. The first two rings are particularly well defined, the others progressively less so, and the terminal portion of the axis is almost smooth. Each side-lobe has six pairs of ribs in addition to the articulating halfring. The first pleural furrows are deep, but those of the other pairs are less well defined. In the case of one of the paratypes (Pl. 2, fig. 1) the outer ends of the pleural furrows appear slightly deeper; consequently the ends of the pleural ribs are better defined there, standing out as a row of small prominences along the pygidial margin.

Holotype. BM In. 57485 (Pl. 2, figs. 2, 6, 7), British Museum (Natural History), London.

Paratypes. BM In. 57483 (Pl. 2, figs. 5, 8, 9), In. 58717 (Pl. 2, fig. 1), In. 58718 (Pl. 2, fig. 3), In. 58719 (Pl. 2, fig. 4).

Horizon and localities. All the type-material was collected along the southern flank of the Montagne Noire, Hérault, south-western France, from mudstones of Arenig age, belonging to the *Didymograptus extensus* Zone. The holotype, together with paratypes In. 57483 and In.

58718, is from the west bank of the River Landeyran, 100 metres downstream from the roadbridge 1.4 kms. south of St. Nazaire de Ladarez. The remaining paratypes are from the hill-side section 240 metres southwest of Le Foulon, near Lugné.

Discussion. Considering the limited material at his disposal it is hardly surprising that Barrande should have assumed the phacopid affinities of his new species. The combination, on the holotype, of large genal spines with thoracic segments of generalized phacopid or calymenid type is certainly reminiscent of a number of the genera of the *Dalmanitacea*. However, unlike that of phacopids, the facial suture is opisthoparian and the additional specimens noted in the present account, as well as by Holub (1908a, p. 13), confirm the latter author's allusion to the calymenid affinities of *Bathycheilus*. Přibyl (1953, p. 19) erected a subfamily *Bathycheilinae* on the basis of this single genus, but more recently Whittington (*in Moore*, 1959, p. O 451) assigned *Bathycheilus* to the subfamily *Calymeninae*. The glabellar outline, thorax and pygidium of *Bathycheilus* are admittedly of calymenid type but the opisthoparian facial suture, paraglabellar areas, long librigenal spines, well-defined preglabellar field and low anterior border appear to merit familial status. When Přibyl proposed the subfamily *Bathycheilinae* he placed in the subfamily *Calymeninae* all the other known Bohemian calymenid genera, including *Pharostoma* HAWLE et CORDA, 1847. Hupé (1953, p. 232) made the last-named genus the type of another family, the *Pharostomatidae* (olim *Pharostomidae*), since regarded by Whittington (*in Moore*, 1959, p. O 454) as a subfamily within the *Calymenidae*. The name *Pharostomatidae* must still stand, even though it has recently been shown that *Pharostoma* is a junior subjective synonym of *Prionocheilus* ROUAULT, 1847 (see Dean, 1964). However, both the *Bathycheilinae* and *Pharostomatidae* contain trilobites of generally similar type and may be regarded as subjective synonyms. Both date from 1953 but *Bathycheilinae* was published in February of that year and so has priority over *Pharostomatidae* which did not appear until April. *Bathycheilinae* is here elevated to familial rank.

Bathycheilus differs from *Prionocheilus* in a number of smaller features. It has a less parabolic glabellar outline which is more reminiscent of that found in such genera as *Calymene* sensu stricto and *Gravicalymene*. In addition the axial furrows of *Bathycheilus* lack the posterior constriction of the axial furrows which delimits the hindmost parts of the paraglabellar areas in *Prionocheilus*. The latter genus also possesses the normal calymenid complement of thirteen thoracic segments while *Bathycheilus* has only twelve. Such a number is unusual in calymenids but its significance should not be overestimated because twelve segments occur in the Anglo-Welsh Ashgill species *Flexicalymene quadrata* KING (1923, p. 504, pl. 26, figs. 1, 2) which otherwise resembles other species of *Flexicalymene* having thirteen segments. The librigenal spines of *Bathycheilus* are larger than those of *Prionocheilus* and apparently lack the ventral row of small spines found in that genus (see, for example, Rouault, 1847, pl. 3, figs. 3, 3a; Whittard, 1960, pl. 18, figs. 2-4). One must point out, however, that the underside of the cephalon of *Bathy-*

cheilus is poorly known. The function of such spines is not yet fully understood and closely similar structures are seen also in the phacopid *Bouleia dagincourti* (ULRICH) from the Lower Devonian of Bolivia (Kozłowski, 1923, p. 56, pl. 6, figs. 7, 8).

The available material suggests that *Bathycheilus perplexus* is larger than the stratigraphically earlier *B. gallicus*. In addition the glabella of the French species is only slightly convergent forwards, contrasting with the more subtriangular outline of *B. perplexus*. Compared with the granulated glabella of *B. perplexus* that of *B. gallicus* is generally very distinctive, with three transverse rows of tubercles, though these are sometimes less strongly developed (Pl. 2, f. 3). The cheeks of both species are high and strongly convex, but the fixigenae of *Bathycheilus perplexus* are markedly broader, especially frontally, with the eyes sited farther back. Paraglabellar areas are about equally developed in both species. The pygidium of *B. perplexus* is apparently more convex and relatively longer than that of *B. gallicus*, but this may be due in part to differences of preservation. The pygidium of the Czech species is, however, better segmented than that of *B. gallicus*, with a larger number of both axial rings and pleural ribs. Outside Czechoslovakia poorly-preserved specimens of *Bathycheilus perplexus* have been found by Thadeu (1956, p. 20) in what are said to be Llandeilo strata, though they may well prove to be of Llanvirn age.

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EXPLANATION OF PLATES

PLATE 1

Bathycheilus perplexus (Barrande)

- Figs. 1, 5, 6. Internal mould of cephalon, Národní Museum ČD. 379. Left lateral, frontal and plan views, X 1.5. Fig. 10. Same specimen illustrating right paraglabellar area, X 4.
- Figs. 2, 3, 9. Internal mould of pygidium, Národní Museum ČD. 380. Left lateral, posterior and plan views, X 2.
- Figs. 4, 7, 8. Cast of holotype in Národní Museum, ČD 377. Left lateral, plan and posterior views, X 1.5.

All from the Šárka Beds, Osek, near Rokycany, Czechoslovakia.

PLATE 2

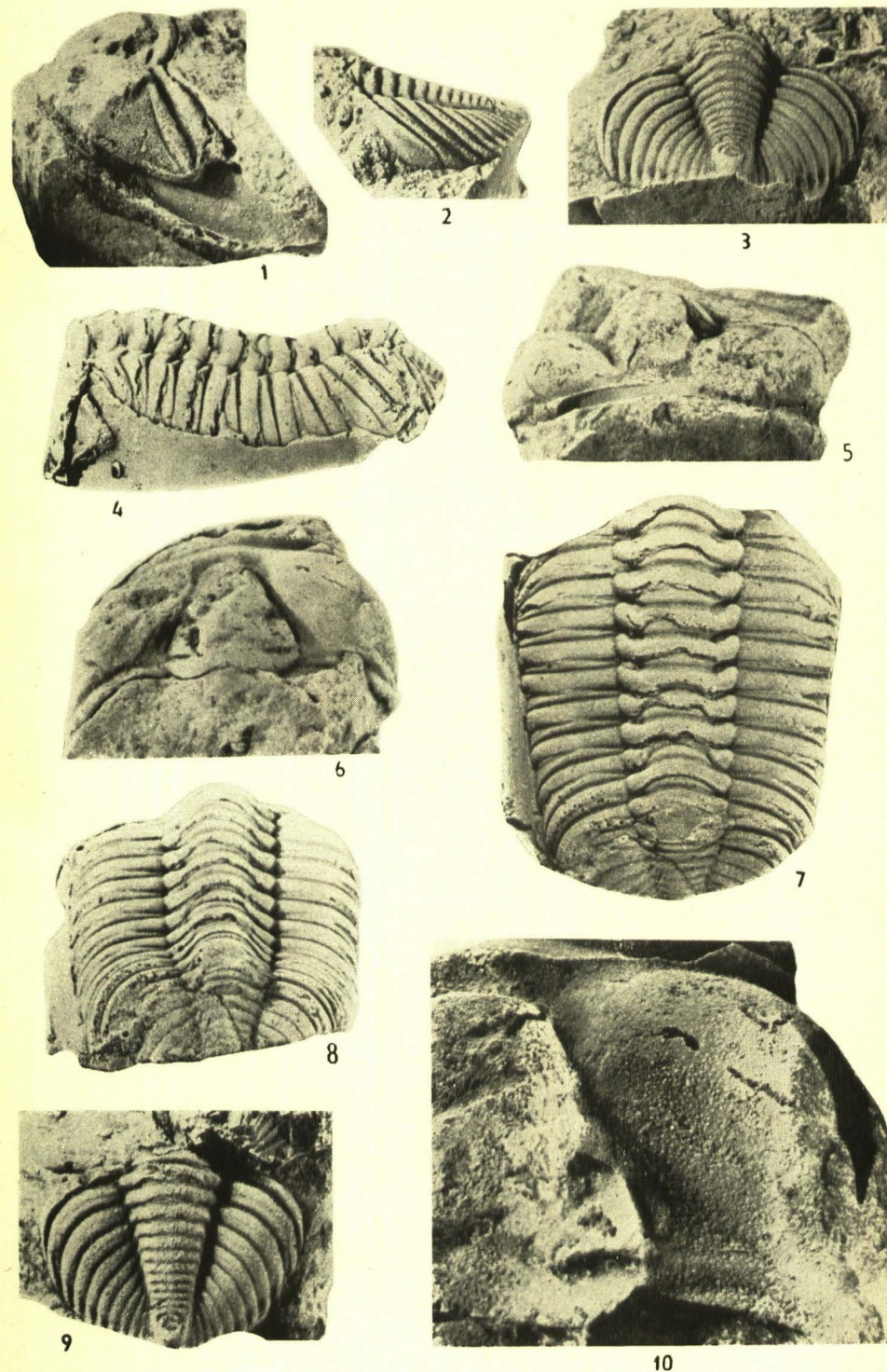
Bathycheilus gallicus sp. nov.

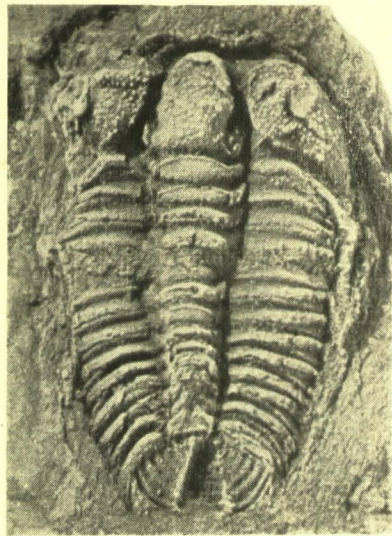
- Fig. 1. Paratype. Internal mould of dorsal exoskeleton with external mould of pygidium in reversed position. BM In. 58717, X. 8. British Museum (Nat. Hist.).
- Figs. 2, 6, 7. Holotype. Latex cast of cephalon. The opisthoparian facial suture is shown most clearly in Fig. 7. BM. In. 57485. Plan, frontal and right lateral views, X 7.
- Fig. 3. Paratype. Latex cast of incomplete cranidium. BM. In. 58718, X 8.
- Fig. 4. Paratype. Internal mould of pygidium. BM In. 58719, X 8.
- Figs. 5, 8, 9. Paratype. Internal mould of cephalon. BM. In. 57483. Right lateral, right anterolateral and plan views, X 4.

All from the Arenig Series of the Montagne Noire, Hérault, France. Figs. 1 and 4 from the section 240 metres south—west of Le Foulon, near Lugné. The remainder from the west bank of the River Landeyran, 100 metres downstream from the road—bridge 1.4 kms. south of St. Nazaire de Ladarez.

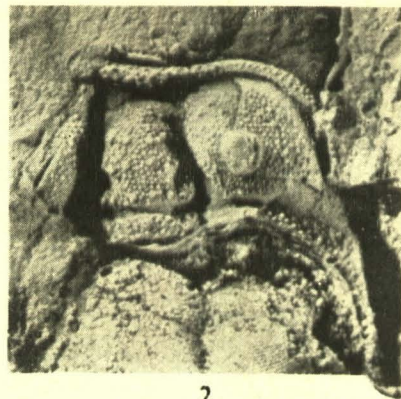
BATHYCHEILUS

PLATE 1

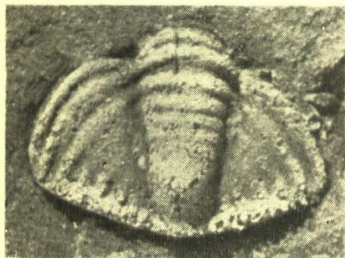




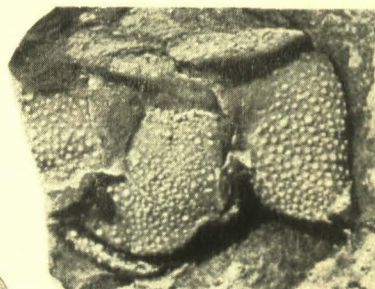
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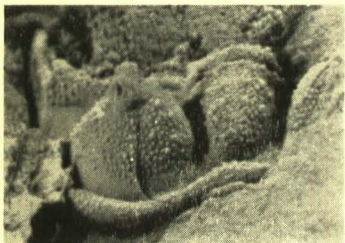
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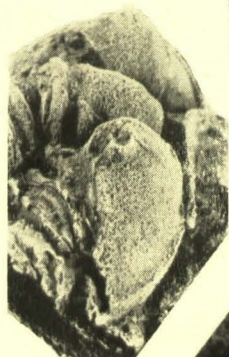
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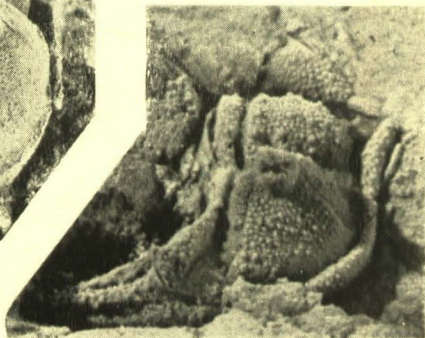
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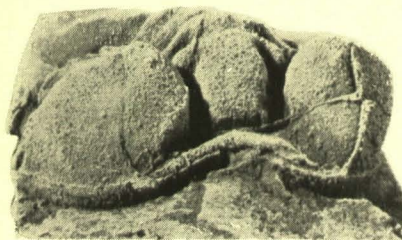
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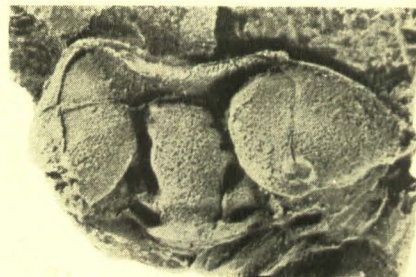
5



7



8



9

SBORNÍK NÁRODNÍHO MUZEA V PRAZE

ACTA MUSEI NATIONALIS PRAGAE

Volumen XXI B (1965), No. 1

REDAKTOR JIŘÍ KOURIMSKÝ

BOŘIVOJ ZÁRUBA

BEITRAG ZUR KENNNTNIS DER ART EXOGYRA SIGMOIDEA
REUSS, 1844 (OSTREIDAE) AUS DER BRANDUNGSFAZIEN
DER BÖHMISCHEN KREIDEFORMATION

Auszug: Die Studie der Art *Exogyra sigmoidea* REUSS, 1844 aus der Brandungsfazien der böhmischen Kreide ist ein Teil der vorbereiteten Monografie über die Familie *Ostreidae*. Ausser den einführenden Kapiteln und dem biostratigrafischen Teil mit Beschreibung der Lokalitäten, wurde die Aufmerksamkeit hauptsächlich der Morfologie, Ontogenesis, Variabilität, Ökologie, den Mikrostrukturen und dem Bau der Gehäuse der studierten Art gewidmet. Da der Holotypus nicht festgestellt wurde, wurde aus dem Topotyp-Material der Neotypus ausgesucht und abgebildet und diagnostische Merkmale angeführt, durch welche sich die Art *Exogyra sigmoidea* REUSS von einigen verwandten Arten unterscheidet [*Exogyra reticulata* REUSS, 1846 und *Exogyra haliotoidea* (SOW., 1813)].

EINLEITUNG

Rezente Austern wurden bisher viel intensiver studiert als fossile. Infolge dessen sind unsere heutigen Kenntnisse der fossilen Austern ziemlich unvollständig.

Die Schwierigkeit des Studiums der Austern besteht besonders in der leichten Anpassungsfähigkeit ihrer Gestalt an die Umgebung, was eine merkliche Variabilität der einzelnen Arten zur Folge hat. Da die Schalen ein und desselben Exemplars von einander oft ziemlich verschieden sind und nach Absterben des Tieres nur selten beisammen vorkommen, werden sie seitens einiger Autoren als verschiedene Arten, sogar als verschiedene Gattungen beschrieben. Dadurch hat sich die Synonymik einiger Arten soweit verzweigt, dass sie vorderhand die Bildung eines Einheits-Systems vollkommen unmöglich macht. Desgleichen ist die Geltung zahlreicher Gattungen problematisch, und die Ansichten einzelner Autoren gehen hier diametral auseinander. Zur Aufklärung trägt sicher auch nicht die Uneinigkeit der morfolologischen Terminologie bei, wie sie von verschiede-