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SILURIAN INARTICULATE BRACHIOPODS FROM POLAND

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Members of four families are recognized from etched Wenlockian carbonates from the eastern Poland. The acrotretids are of special interest as being recorded in the Polish Silurian for the first time. Of two acrotretid species, *Opsiconidion podlasiensis* is described as new. The dorsal median septum of the genus *Opsiconidion* is discussed in detail.

Key words: Brachiopoda, Inarticulata, morphology, taxa, Silurian, Wenlock, Poland.

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INTRODUCTION

Since 1958 the geology of the Podlasie Depression, east Poland, has been studied by Tomczyk (e.g. 1958, 1970), Tomczykowa and Tomczyk (1979) on the basis of many boreholes drilled by the Geological Institute, Warszawa in 1958 to 1978.

Of great interest is the presence of the Middle Silurian developed as marly carbonate lithofacies rich in benthic fauna (Tomczykowa and Tomczyk 1979). It includes, among others many brachiopods which constitute an important part of the Podlasie Depression fauna. Dr. E. Tomczykowa and Dr. H. Tomczyk have drawn the present author's attention to the brachiopods of that region.

When studying the Wenlock articulate brachiopods from the eastern part of the Podlasie Depression, dozens of samples from several boreholes have been dissolved in acetic acid. The residues of the diluted samples have revealed a great diversity of microfossils (e.g. conodonts, scolecodonts, rare and small fragments of graptolites) and a small but valuable collection of inarticulate brachiopods, found in only two of the six boreholes. According to the present data they are presumably limited to the eastern part of the Podlasie region, in the vicinity of Bielsk Podlaski.

Six inarticulate brachiopods, including one new species, are described.

Of these special attention is paid to the acrotretids recorded, for the first time, in the Silurian of Poland (fig. 1).

General knowledge of the acrotretids is still insufficient and that on the Silurian-Devonian forms remains extreemly poor, thus all information on these fossils based on new discoveries is desirable.

The described collection is housed in the Museum of the Geological Institute, Warszawa, abbreviation of which is MUZ IG.

Fig. 1. Location of the area of origin of the brachiopod examined.

STRATIGRAPHY AND OCCURRENCE

In their important paper Tomczykowa and Tomczyk (1979) give all the information on the detailed biostratigraphy, based on graptolites and benthic fauna. They also discuss the correlation problems of these strata in the light of the present knowledge of the Silurian in Poland and Europe (Tomczykowa and Tomczyk 1979: Table 3).

Characteristic of the Podlasie Depression is the development of sediments of shallow neritic facies. Towards the East, there is a distinct, gradual increase of carbonates in the argillaceous Silurian deposits, and consequent changes in the faunal assemblages; the disappearing graptolites become replaced by a rich and rather well preserved benthic shelly fauna in the eastern part of the region.

One of the other characteristics of the Podlasie Depression is an incompleteness in the development of the Silurian and the uncorformity between the Ordovician and Silurian. This incompleteness increases to the East.

The Lower Silurian of the Llandovery Series in the Western part of the Podlasie Depression begins with the *Akidograptus ascensus* Zone and the *Orthograptus? acuminatus* Zone (e.g. borehole Tłuszcz IG-1, Łochów IG-1) or with the *Coronograptus cyphus* Zone to *C. gregarius* Zone (e.g. boreholes Żebrak IG-1, Okuniew IG-1, Dobre IG-1, Polaki IG-1: Tomczykowa and Tomczyk 1979). The gaps between the Ashgill and the Llandovery are due to the Taconic phase as in the Peribaltic Syneclise (Tomczyk 1976; Tomczykowa and Tomczyk 1979).

The Llandovery Series in the central part of the Podlasie Depression starts with the *Coronograptus gregarius* Zone-*Monograptus sedgwicki* Zone or *Spiridograptus turriculatus* Zone, e.g. bohehole Sokołów Podlaski IG-1, and further to the north-east the borehole Wrotnów IG-1 with the *Monograptus crispus* Zone. In the borehole Stadniki IG-1 only the top of the Llandovery strata are present (Tomczykowa and Tomczyk 1979).

In the eastern part of the Podlasie Depression (boreholes Mielnik IG-1, Terespol IG-1, Biała Podlaska IG-1 and 2) only carbonate deposits of the Middle Silurian occur and the Wenlock Series directly overlies the Caradoc deposits or, locally, the lower Ashgill (Tomczyk 1974*b*, 1970; Tomczykowa and Tomczyk 1979). A similar situation occurs in the area of the Bielsk Podlaski in the easternmost part of the Podlasie Depression: e.g. in the boreholes Sobótka IG-1, Proniewicze IG-1, Widowo IG-1, Rajsk IG-2.

These Caradoc or Ashgill deposits are overlain by marly calcareous deposits of the *Cyrtograptus murchisoni* Zone or the *Monograptus riccartonensis* Zone (Lower Wenlock) and locally even higher zones (Tomczykowa and Tomczyk 1979).

Tomczykowa and Tomczyk (1979) have distinguished in the Silurian of the Podlasie Depression two regional stages: the Bielskian (Lower and Upper) corresponding to the Wenlock, and the Mielnikian (Lower and Upper) to the Ludlow.

The deposits of the Bielskian stage comprise marls, marly claystones with intercalations and lenses of organodetritic limestones; the fauna is rich both in taxa and number of specimens: crinoids, tabulates, conodonts, scolecodonts, ostracods, articulate and inarticulate brachiopods, trilobites, molluscs and sometimes very poor and rare fragments of graptolites.

The brachiopods described in this paper come from the area of Bielsk Podlaski (fig. 1), in the easternmost part of the Podlasie Depression and from deposits corresponding to the Bielskian stage (*sensu* Tomczykowa and Tomczyk 1979). They all occur in marls and marly intercalations in

limestone of only two boreholes, namely: Sobótka IG-1, at the depth 521.8 m—478.0 m, and Widowo IG-1 at the depth of 593.0 m—583.7 m, and these deposits correspond to the middle part of the Upper Bielskian stage (Tomczykowa and Tomczyk 1979: fig. 3). The Upper Bielskian stage in that part of the Podlasie Depression attains a great thickness, an average of 80 m—130 m or more, e.g. in the Widowo IG-1 section it is 134 m thick (Tomczykowa and Tomczyk 1979: 78).

Inarticulate brachiopods are relatively rare in both number of species and individuals. They comprise members of four families: Craniopsidae with *Craniops implicatus* (J. de C. Sowerby); Trimerellidae with *?Dinobolus* sp.; Acrotretidae with *Opsiconidion podlasiensis* sp. n. and *O.* aff. *celloni* (Cocks); Discinidae with *?Orbiculoidea* cf. *forbesi* (Davidson) and *Schizotreta* sp. All these brachiopods are disarticulated. Almost all are partially or severely broken, in particular *?Orbiculoides* cf. *forbesi*, *Schizotreta* sp., and thickwalled *?Dinobolus* sp. in which only very small fragments of valves occur in residues. As to the acrotretids they are relatively better preserved and thus suitable for some electron microscopic studies. They are also slightly more numerous. The brachial valves are more common and often preserve imprints of muscle scars but rarely traces of pallial sinuses. The dorsal median septum is usually damaged. Of the few pedicle valves, only two are nearly complete and show the general pattern of the protegular pitting and ornamentation of the adult shell.

SYSTEMATIC PALAEONTOLOGY

Family **Craniopsidae** Williams, 1963
Genus *Craniops* Hall, 1859
Craniops implicatus (J. de C. Sowerby 1939)
(pl. 24: 1, 3; pl. 25: 3)

1978. *Craniops implicatus* (J. de C. Sowerby); Cocks: 20.

Material. — One almost complete specimen with both valves closed, a few fragments of particular valve, two of them preserve fragments of ridges bounding the dorsal muscle scars.

Remarks. — Subtransverse outline, subcentrical umbo and widely spaced concentric lamellae make the specimens in question very close to *Craniops implicatus* from the Much Wenlock Limestone Formation of England (Cocks 1978: 20).

Occurrence. — England: Silurian, Much Wenlock Limestone Formation, Dudley, West Midlands. Poland: Wenlock, Upper Bielskian stage (middle part), Podlasie Depression; Widowo IG-1 profile (depth 587.7 m—588.7 m); Sobótka IG-1 profile (depth 508.2 m, 509.1 m—510 m; 517.8 m—518.8 m), found in marls and marly intercalations in limestone.

Family **Trimerellidae** Davidson and King, 1872
Genus *Dinobolus* Hall, 1871

?*Dinobolus* sp.
(pl. 24: 4, 5; pl. 25: 1, 4)

Material. — Several small fragments of disarticulated valves with the posterior portions of the pedicle valve dominating; the largest fragment in the collection is figured (MUZ IG 1506.II.27).

Remarks. — The preserved fragments are suggestive of specimens of comparatively large size with greatly thickened shell. One of the fragments including the posterior part the pedicle valve, the largest available, shows a triangular and thickened homeodeltidium with well marked growth lines and similarly thickened and ornamented propareas (pl. 24: 4; pl. 25: 1, 4) like members of the genus *Dinobolus* (Rowell 1965: H274, fig. 169.5) and are, provisionally, assigned to it.

Occurrence. — Poland: Silurian, Wenlock, Upper Bielskian stage (middle part), Podlasie Depression; Sobótka IG-1 profile (depth 508.2 m—509.1 m).

Family **Acrotretidae** Schuchert, 1893
Subfamily **Torynelasmatinae** Rowell, 1965
Genus *Opsiconidion* Ludvigsen, 1974

Opsiconidion: Ludvigson 1974: 143 (*partim*):
Caenotreta: Cocks 1979: 94
Opsiconidion: Bitter and Ludvigsen 1979: 706
Opsiconidion: Popov 1981*a*: 36
Opsiconidion: Popov 1981*b*: 61
Caenotreta: Mergl 1982: 115.

Remarks. — The original diagnosis of the genus (Ludvigsen 1974) and the revised one (Bitter and Ludvigsen 1979) comprise several features of external morphology and of dorsal interior well defining the taxon. Among these features, the dorsal median septum with undifferentiated ventral margin or displaying a "hollow", pipe-shaped callus is mentioned as a rather good generic criterion.

Similarly, in the definition of the genus *Caenotreta* (synonimous with *Opsiconidion*) the dorsal median septum with its upper rod (= hollow pipe-shaped callus) is mentioned as significant of the genus level and the lower rod or ?rods on the anteroventral margin of the septum as a complementary generic feature (Cocks 1979).

The appearance of the top of the septum is considered to be the main characteristic of specific value (Cocks 1979). This part of the septum may be somewhat differentiated on which three Silurian species from the Welsh Borderland and Austria were based, namely: *"Caenotreta" aldridgei* Cocks possessing a single upper rod; *"C." celloni* Cocks developing a pair of rods fused medially and "C." sp. with upper rods reduced to small swellings (Coks 1979: 96—99).

In general, a median septum of the *Opsiconidion* kind appears not to be confined to that genus. Similar elements, like upper rod or rods and/or anterolateral ones, are also noted for some other acrotretids, including species the generic status of which remains uncertain. These are, among others: ?*Caenotreta* sp. from the Lower Ordovician of Wales (Lockley and Williams 1981: 21, figs. 50—52) with the upper single and the lower anteroventrally projected rods; *Conotreta? devota* Krause and Rowell from the Ordovician of Nevada possessing, just like *Opsiconidion celloni* (Coks 1979: pl. 14: 6—8), a posteroventral margin thickened in a rod-like form extending anteriorly as a "spine", and anteroventrally bearing one or two "spines" (rods) embedded in the septum and giving to it a somewhat ribbed appearance

(Krause and Rowell 1975: 35, pl. 11: 5). Such ribbing, but better developed is also noted in old individuals of e.g. *Myotreta* sp. a species from Ordovician (erratic boulders) (Biernat 1973: figs. 14, 15, 17). Such a spectacular septum may be evidence of the relation of the degree of ribbing (foldding) to the individual age of the animal (Cocks 1979: 96).

The same kind of paired upper rods characteristic of *Opsiconidion celloni* (Cocks 1979: pl. 14: 6, 7) has been described in *"Torynelasma" rossicum* (Biernat 1973: fig. 18: 1a—1c; 2a—2c), the Ordovician erratic boulder species. An abnormality occurs in one specimen of that species (Biernat 1973: fig. 18: 3a—3c) in which an upper rod diverges anteriorly and the two irregularly developed prongs are turned down to the brachial valve floor. A tendency for an upper rod to be furrowed occurs also in *Opsiconidion* aff. *celloni* (Cocks) from the Podlasie Depression (pl. 29: 1), in the Lower Devonian *Opsiconidion minor* of Novaya Zemlya (Popov 1981b; pl. 1: 5, 7), and in the Upper Silurian *"Caenotreta" ephemera* of Bohemia (Mergl 1982: pl. 1: 6, 9, 10).

To sum up, the above mentioned illustrations are examples of small variations that modify the simple dorsal septum but on a rather limited scale. As the limits of this variability are potentially narrow, it seems obvious that similar structures modyfying the septum in a similar fashion could be developed in a number of genera et species. These small modifications when regarded in the context of the co-occurring, relatively small, internal and/or external differences of the shell are considered to be important taxonomically and, as a rule, justifying the erection of new genera and species (e.g. Cocks 1979, Popov 1981, Mergl 1982).

The dorsal septum of *Opsiconidion* is of significant appearance and is, also considered here, to have a diagnostic value at and above the species level (Cocks 1979: 94; Popov 1981*a*, 1981*b*). The septum, together with, for example, the cardinal tubercles, and conical pedicle displaying a variable pattern of protegular pitting (Bitter and Ludvigsen 1979) make this genus quite distinct.

The dorsal septum of *Opsiconidion* has much in common with that of the European representatives of *Torynelasma* like *Torynelasma rossicum* (Goryanski 1969: pl. 12: 19, 20; Biernat 1973: pl. 20: 1—6) the latter displaying an upper plate which is narrow, flat to slightly rounded and somewhat widening anteriorly. *Opsiconidion* appears to continue the general type of *T. rossicum* septum, attaining its progressive stage of development by the narrowing of an upper plate.

Opsiconidion is a distinctive genus having many features in common with the Torynelasmatinae (Cocks 1979: 94; Bitter and Ludvigsen 1979: 706; Popov 1981*a* 1981*b*). These features include the conical pedicle valve and the ridges defining the elongate imprints of the dorsal cardinal muscle scars which are especially distinct on both sides of the median septum (Ludvigsen 1974: 145, figs. 5, 8; Popov 1981*a*: pl. 2: 2, 3b; this paper, pl. 28: 1). The protegulum of *Opsiconidion* species is pitted but the pattern of pitting varies from non-cross cutting, very much like that of *Torynelasma* (pl. 27: 1) to a distinctly cross-cutting pattern as shown by *Opsiconidion arcticon* Ludvigsen, the type species of the genus from the Lower Devonian of Canada (Ludvigsen 1974: fig. 4: 3; Bitter and Ludvigsen 1979, pl. 90: 2—4, 11—12; pl. 91: 4, 5, 9, 11). This kinds of protegular pitting (Biernat and Williams 1970) appear to depend on the longevity of the larval stage, hence are related to the environmental conditions and thus may have an ecological significance (Bitter and Ludvigsen 1979: 714).

Thus, *Opsiconidion* is assigned here to the subfamily Torynelasmatinae Rowell following Cocks and other authors (Cocks 1979; Bitter and Ludvigsen 1979; Popov 1981*a*, 1981*b*; Mergl 1982), and may be considered as a presumed descendent of the European *Torynelasma*.

The Podlasian Silurian forms, although rather rare and poorly preserved, fit, in general, the definition of *Opsiconidion* and are treated as its true members.

Opsiconidion podlasiensis sp. n.

(pl. 26: 1, 2; pl. 27: 1a—1e; pl. 28: 1—3; pl. 29: 2—3; pl. 30: 1—3; pl. 31: 1—2)

Type specimen: MUZ IG 1506.II.39, pl. 28: 1a—1c (brachial valve); paratype: MUZ IG 1506.II.19, pl. 27: 1a—1e (pedicle valve).

Type locality: Sobótka, eastern part of Poland, Podlasie Depression.

Type horizon: Wenlock, Upper Bielskian stage, Sobótka IG-1, depth 508.2 m—509.1 m; marls and marly intercalations in limestone.

Diagnosis. — Acrotretid with a weak intertrough on the conus, dorsal septum with an upper rod of slightly varying appearance, lower rod present or absent.

Material. — Twelve almost complete brachial valves but with median dorsal septum often damaged; two pedicle valves rather well preserved; many fragments of disarticulated valve.

Dimensions (in mm):

Pedicle valve	length	width		protegulum	
MUZ IG 1506.II.19		posteriorly	anteriorly	length	width
paratype	1.2	0.2	0.73	0.21	0.2
Brachial valve	length	width		septum	
MUZ IG 1506.II.39				length	width
holotype	0.69	0.84		0.51	0.1

Description. — Pedicle valve highly conical just like *Torynelasma* (Cooper 1956: pl. 18E; Goryanski 1969: pl. 12: 15—18, 21; Biernat 1973: pl. 20: 9) or *Opsiconidion* (Cocks 1979: pl. 14: 5; Bitter and Ludvigsen 1979, pl. 91: 10; Popov 1981*a*: pl. 2: fig. 6). Intertrough indistinctly marked is narrow, to about 0.085 mm wide, parallel-sided, shallow (pl. 26: 1b; pl. 27: 1). Brachial valve almost as wide as long, the widest about midlength of valve. Ventral protegulum constituting about one-fifth of the whole valve length and that of the brachial valve to about one-fourth of it. The protegula are pitted in a pattern very much like that of "*Torynelasma*" (Biernat and Williams 1970: pl. 101: 1, 2; Biernat 1973: pl. 21: 4; Cocks 1979: pl. 4: 1), these pits however, are shallower and with flatter bottoms (pl. 27: 1b, 1c), and correspond to the stage of the Bitter and Ludvigsen model of protegulum pitting (Bitter and Ludvigsen 1979: fig. 3). Some specimens show some kind of overlapping and cross-cutting relationship to adjoining pits, somewhat like that in *Opsiconidion arcticon* (Ludvigsen 1974, Bitter and Ludvigsen 1979; this paper, pl. 28: 2b). The protegula are well delimited from the adult shell, usually by a distinct concentric thickening. Posterior margin of the dorsal protegulum is raised above the pseudointerarea forming a slightly anchylosed thickening (pl. 28: 1b, 1c; pl. 29: fig. 1a). The swellings on the external surface of the dorsal protegulum diverge anteriorly and a furrow between them continues anteriorly on the adult shell in something like a median depression (pl. 29: 2a).

Pseudointerarea of somewhat varying width and height shows very weakly depressed median concavity, the growth lines being sometimes much thickened (pl. 28: 1c; pl. 29: 1b). Median dorsal septum long, a feature characteristic of *Opsiconidion*, extending from the pseudointerarea and ending at a distance of about 0.2 mm from the anterior margin of the brachial valve (pl. 28: 1a; pl. 29: 1). Its upper rod is in the form of a tube somewhat varying in width, remaining almost equally narrow or slightly widening anteriorly (pl. 28: 1a, 1b; pl. 30: 2, 3a, 3b).

Muscle scars large, somewhat flabellate in appearance, with thickened internal ridges diverging anteriorly and extending to about one-half of the median dorsal septum length (pl. 30: 1, 2). Pallial sinuses, sometimes preserved, of pinnate character (pl. 31: 1b).

Interior of the pedicle valve unknown.

Remarks. — The species shows some variation in the brachial valve outline, width of pseudodeltidium and in the appearance of the upper and lower septal rods. It has much in common with *Opsiconidion aldridgei*, from the Silurian of Welsh Borderland (Cocks 1979: pl. 13: 1—7; pl. 14: 1—4) and of Estonia (Popov 1981*a*: pl. 1: 1—3; pl. 2: 1—6; fig. 2), differing in having shorter and higher pseudointerarea, distinctly thickened and divergent ridges flanking on both sides of median dorsal septum and having developed lower septal rod. Externally, *O. podlasiensis* is very similar to *O. celloni* (Cocks), differing in possessing a simple upper rod (Cocks 1979: pl. 14: 6—8; this paper pl. 28: 1a, 1b; pl. 30: 1—3) and in having higher pseudointerarea. The same features distinguish our species from the Lower Devonian *O. minor* of Novaya Zemlya (Popov 1981*b*: pl. 1). *Opsiconidion arcticon* Ludvigsen from the Lower Devonian of Canada has the brachial valve almost circular, narrowed posteriorly with smaller pseudo interarea and different pattern of protegular pitting (Ludvigsen 1974: figs. 4, 5; Bitter and Ludvigsen 1979: pl. 90, 91). To this species can be assigned a brachial valve coming from the Sobótka IG-1 profile: found at a depth 520.8—521.8 m. It differs a little by its much smaller size (to about 0.5 mm in length), very indistinct lateral ridges on both side of a median septum, and thin upper septal rod. These differences are small and may have no taxonomic value.

Occurrence. — Poland: Wenlock — Upper Bielskian stage (middle part), Podlasie Depression; Sobótka IG-1 profile (depth: 478 m—490 m; 507.6 m—508.2 m; 520.8—521.8 m); Widowo IG-1 profile (depth: 583.9 m—584.8 m; 585.7 m—586.7 m; 587.7 m—588.7 m; 589.8 m—590.8 m; 591.9—593.6 m), found in marls and marly intercalations in limestone.

Opsiconidion aff. *celloni* (Cocks 1979)
(pl. 29: 1a, 1b)

1979. *Caenotreta celloni* Cocks: 98, pl. 14: 6—8.

Material. — Almost complete brachial valve, many fragmentary brachial and pedicle valves.

Dimensions (in mm):

	length	width	protegulum		septum	
			width	length	length	width
brachial valve MUZ IG 1506.II.18	0.7	0.7	0.15	0.15	0.5	0.08

Description. — Pedicle valve unknown. Brachial valve with roundly outlined lateral and anterior margins, as wide as long, the widest about its midlength. Dorsal pseudointerarea is short and triangular with extreemely slight median concavity and small propareas, each proparea about one-fifth of the pseudointerarea width (pl. 29: 1a—1b). Median septum long, prominent, highest at about its midlength, extending from the pseudointerarea and ending at a distance of 0.3—0.2 mm from the anterior margin. Its upper rod is only slightly furrowed on the anterior end, the lower one is not very distinguishable (this part of septum is damaged). Cardinal muscle scars ovate to a little ?flabellate, attaining a half of the whole valve length, bordered on their inner sides by two ridges extending some distance from the pseudointerarea to about the midpoint of valve.

Remarks. — Although the description of the above form is much incomplete, being based on the brachial valve only, it is, in general, very close to *Opsiconidion*

celloni (Cocks) from the Llandovery of Austria (Cocks 1979, pl. 14: 6—8), differing somewhat in having a more triangular pseudointerarea with extremely weak median concavity, and two thickened and divergent anteriorly ridges on both sides of the dorsal septum. The most conspicuous difference, however, is the upper rod being slightly furrowed for only a short distance. Such slight furrowing of the upper rod is also described in *O. parva* from the Lower Devonian of Novaya Zemlya (Popov 1981*b*: pl. 1: 5, 7) and in *"Caenotreta" ephemera* from the Upper Silurian of Bohemia Mergl 1982: pl. 1: 6, 9). This furrowing is developed in forms of ratther distance geographical sites (Austria, Bohemia, Poland, Novaya Zemlya) and of a wide stratigraphical range (throughout Silurian to Devonian). The furrowed upper rod (?plate) is always more flattened and this feature appears to show a tendency to develop two rods. The described brachial valve from the Podlasie Depression may be representative of a new species, but lack of stratigraphical range make the specific assignement doubtful.

Occurrence. — Poland: Silurian, Wenlock-Upper Bielskian stage (middle part), Podlasie Depression; Sobótka IG-1 profile (depth 507.6 m—508.2 m); found in marls.

Family **Discinidae** Gray, 1840
Genus *Orbiculoidea* d'Orbigny, 1847
?*Orbiculoidea* cf. *forbesi* (Davidson, 1848)
(pl. 24: 2)

1950. *Orbiculoidea* (*Schizotreta*) *forbesi* (Davidson); Whittard and Barker: 556, pl. 5: 1.

Material. — A few fragments of valves.

Remarks. — The available fragments show traces of macro-, and microlines characteristic of *Orbiculoidea*. No other features are preserved, hence no detailed comparison can be made. The specimens are tentatively regarded as representing the Davidson species.

Occurrence. — England: Silurian, Much Wenlock Limestone Formation, Dudley, West Midlands. Poland: Wenlock — Upper Bielskian Stage (middle part), Podlasie Depression; Sobótka IG-1 profile (depth 509.1 m—510.1 m; 512 m—513 m; 515 m—516 m; 517.8 m—518.8 m; 520.8 m—521.8 m); found in marls and marly intercalations in limestone.

Genus *Schizotreta* Kutorga, 1848
Schizotreta sp.
(pl. 25: 2)

Material. — A few fragments of valves, very small.

Remarks. — Very thickened surface ridges suggest their affiliation to the genus *Schizotreta*.

Occurrence. — Poland: Silurian, Wenlock-Upper Bielskian stage (middle part), Podlasie Depression; Sobótka IG-1 profile (depth 507.6—508.2 m).

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GERTRUDA BIERNAT

SYLURSKIE INARTICULATA (BRACHIOPODA) Z POLSKI

Streszczenie

Opisane ramienionogi pochodzą z węglanowych skał osadowych (wenlok), z otworów wiertniczych: Sobótka IG-1, z głębokości 478—521 m oraz Widowo IG-1 z głębokości 583—594 m, w najbardziej na wschód położonej części regionu podlaskiego (Podlasie Depression w/g Tomczykowej i Tomczyka 1979) w okolicy Bielska Podlaskiego.

Ramienionogi bezzawiasowe należą do rzadkich skamieniałości zarówno pod względem taksonomicznym, jak i ilości okazów. W opracowanym materiale są one reprezentowane przez 5 rodzajów: *Craniops, Dinobolus, Opsiconidion, Orbiculoidea, Schizotreta*; zachowane są przeważnie jako fragmenty skorupek. Występujące w zespole akrotrety, po raz pierwszy stwierdzone w polskim sylurze, reprezentowane są przez dwa gatunki rodzaju *Opsiconidion* Ludvigsen (*O. podlasiensis* sp. n. oraz *O.* aff. *celloni* (Cocks 1979). Rodzaj ten charakterem dorsalnego septum jest zbliżony zwłaszcza do europejskich przedstawicieli rodzaju *Torynelasma* (i.e. *T. rossicum* Goryanski) i może być uznany w tej linii za formę filogenetycznie pochodną.

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EXPLANATION OF THE PLATES 24—31

Plate 24

1, 3. *Craniops implicatus* (J. de C. Sowerby: *1a* complete ?brachial valve, ×45; *1b* enlarged fragment, ×150; Muz IG 1506.II.24; *3* fragmentary dorsal interior, central part with a fragment of lateral ridge bounding the muscle scars, ×150; MUZ IG 1506.II.25, Sobótka IG-1, depth 508.2—509.1 m. See also pl. 25: 3.

2. *?Orbiculoidea* cf. *forbesi* (Davidson): badly fragmented valve showing a surface ornament, ×100; MUZ IG 1506.II.32, Sobótka IG-1, depth 508.2 m—509.1 m. See also pl. 25: 3.

4, 5. *?Dinobolus* sp.: *4* homeodeltidium and two propareas, ×40; MUZ IG 1506.II.27, Sobótka IG-1, depth 508.2 m—509.1 m; *5* external view of a fragmentary brachial valve, umbonal part preserved, ×120; MUZ IG 1506.II.33, Sobótka IG-1, depth 507.6 m—508.2 m. See also pl. 25: 4.

Plate 25

1, 4. *?Dinobolus* sp.: *1* posterior view of a fragmentary pedicle valve, homeodeltidium and propareas greatly damaged, ×45; MUZ IG 1506.II.30, Sobótka IG-1, depth 516.0 m—516.8 m. *4* fragment of homeodeltidium and proparea of a specimen figured in pl. 24: 4, ×300.

2. *Schizotreta* sp.: fragmentary valve with distinct concentric ridges, ×75; MUZ IG 1506.II.31, Widowo IG-1, depth 590.8 m—591.9 m.

3. *Craniops implicatus* (J. de C. Sowerby): the same specimen as in pl. 24: 3, ×75.

Plate 26

1, 2. *Opsiconidion podlasiensis* sp. n. *1a* detail of pedicle protegulum, ×3000; *1b* pedicle valve, trace of interthrough, ×70; *1c* posterior view of a pedicle valve, ×400; MUZ IG 1506.II.28, Sobótka IG-1, depth 478 m—490 m. *2* internal view of a brachial valve, ×120; MUZ IG 1506.II.29, Sobótka IG-1, depth 478—490 m.

Plate 27

1a—e. *Opsiconidion podlasiensis* sp. n., paratype. *1a* pedicle valve, interthrough traced, ×70; *1b* detail of protegulum, ×3000; *1c* detail of protegulum and adult shell, ×3000; *1d* detail of adult shell, ×1000; *1e* protegulum and fragment of adult shell, ×1000; MUZ IG 1506.II.19, Sobótka IG-1, depth 508.2 m—509.1 m.

Plate 28

1—3. *Opsiconidion podlasiensis* sp. n. *1a* holotype, brachial valve interior, ×100; *1b* slightly in side view, ×200; *1c* fragment of central part of interarea, ×450; Muz. IG. 1506.II.39, Sobótka IG-1, depth 508.2—509.1 m. *2a* external view of a brachial valve ×130; *2b* detail of protegulum, ×3000; MUZ IG 1506.II.40, Sobótka, IG, depth 508.2—509.1 m. *3* brachial valve interior slightly anchylosed, ×120; MUZ IG 1506.II.36, Sobótka IG-1, depth 508.2—509.1 m.

Plate 29

1. *Opsiconidion* aff. *celloni* (Cocks); *1a* details of dorsal interior with slightly furrowed upper rod, ×120; *1b* detail of pseudointerarea, ×250; MUZ IG 1506.II.18, Sobótka IG-1 depth 507.6 m—508.2 m.

2—3. *Opsiconidion podlasiensis* sp. n. *2a* exterior of a brachial valve, protegulum

with two distinct swellings, ×130; *2b* detail of dorsal protegulum, ×3000; MUZ IG 1506.II.22, Sobótka IG-1, depth 507.6—508.2 m, *3* dorsal interior of adult specimen figured on pl. 28: 3, ×130.

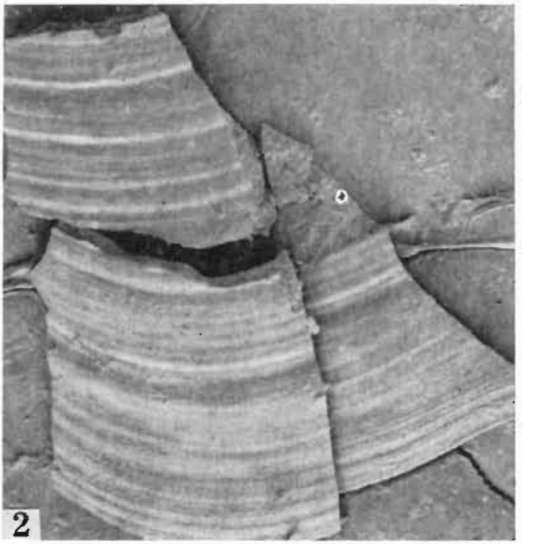
Plate 30

1—3. *Opsiconidion podlasiensis* sp. n.: *1* dorsal interior of adult specimen; ×120; MUZ IG 1506.II.21, Widowo IG-1, depth 583.9—584.8. *2* Dorsal interior in side view, ×120; MUZ IG 1506.II.23, Widowo IG-1 depth 585.7—586.7 m. *3a* dorsal interior slightly in side view, ×100; *3b* dorsal median septum in side view, ×280; MUZ IG 1506.II.20.

Plate 31

1—2. *Opsiconidion podlasiensis* sp. n.: *1a* pseudointerarea with apical elevation of the dorsal protegulum, ×300; *1b* brachial valve anteriorly with traces of pallial sinuses, ×300; *1c* side view of brachial valve, ×130; MUZ IG-1 1506.II.17. *2* internal view of a brachial valve ×130; MUZ IG 1506.II.16. Widowo IG-1 depth 589.1—590.8 m.


1a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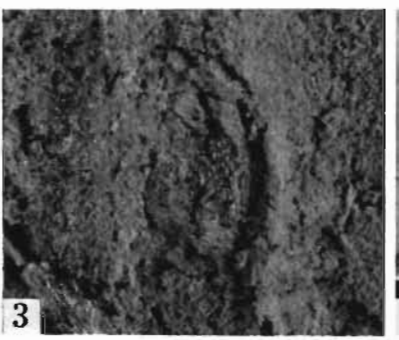
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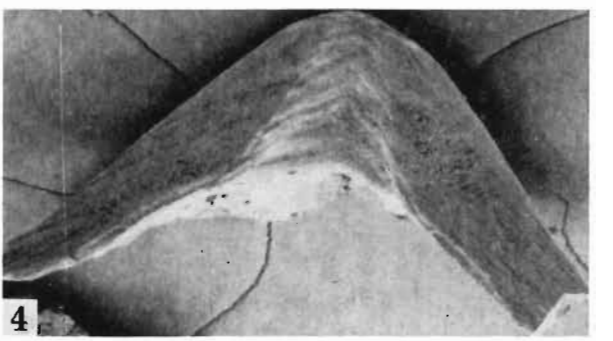
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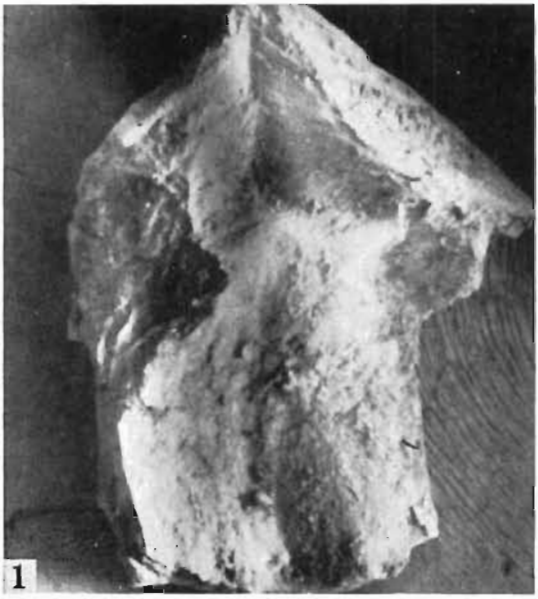
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2


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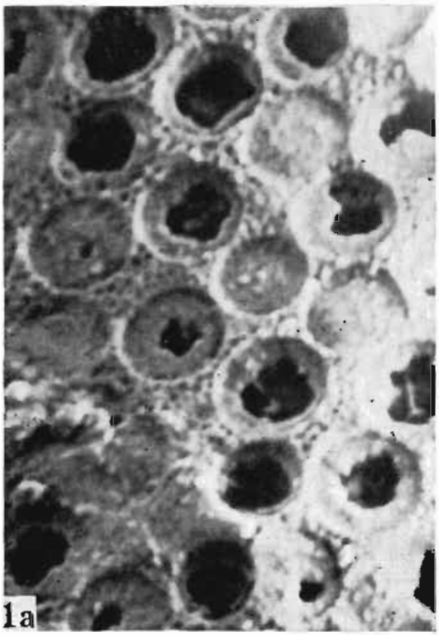
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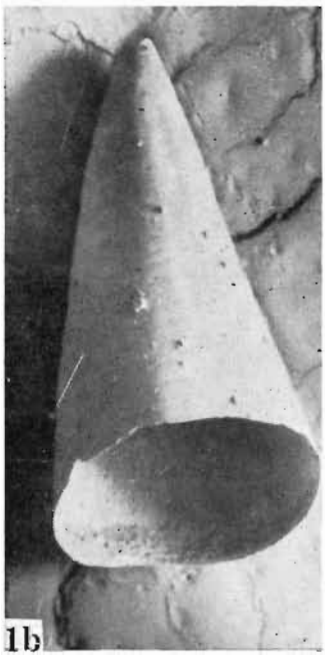
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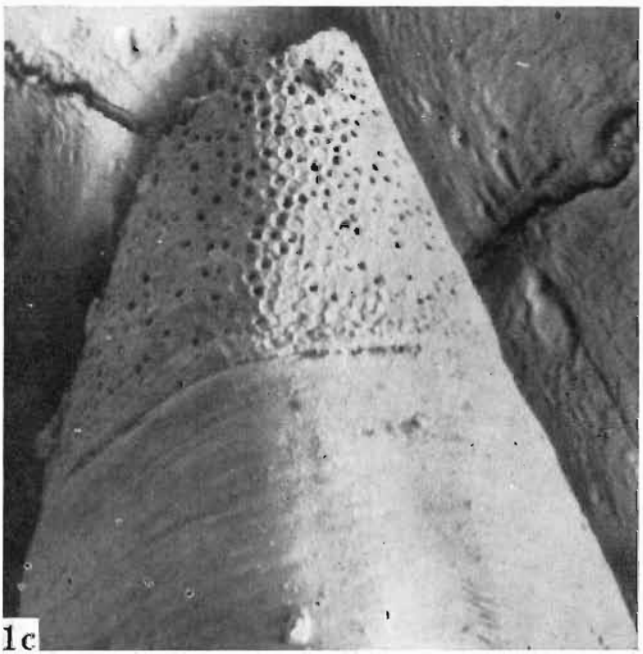
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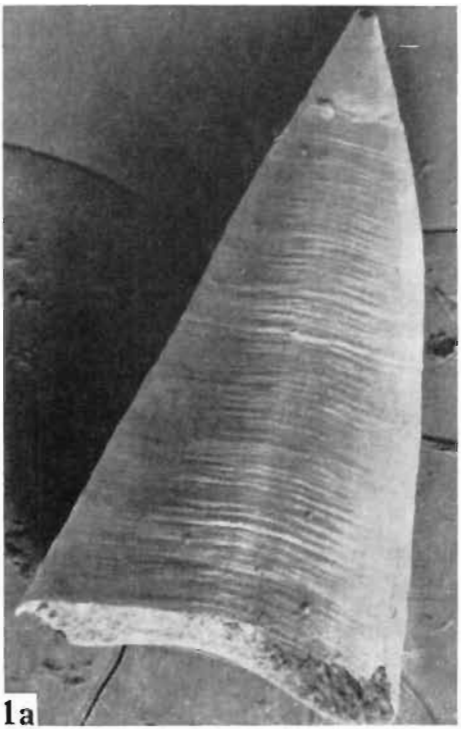
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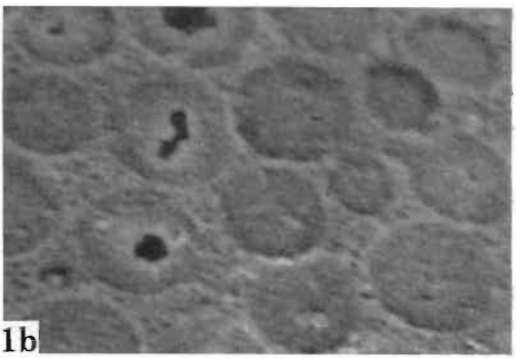
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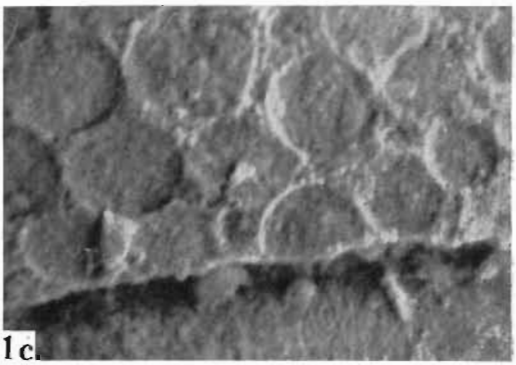
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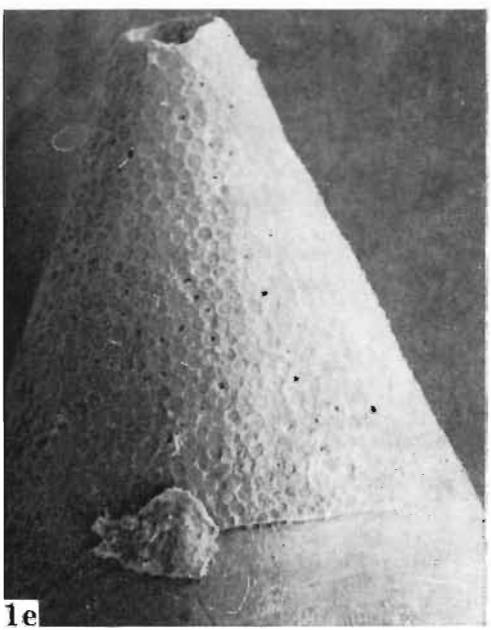
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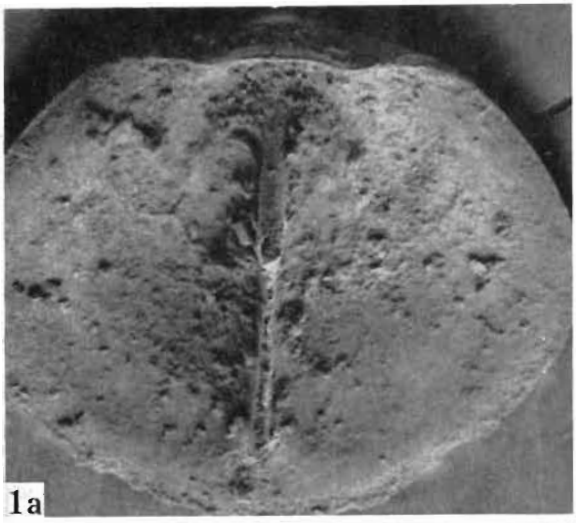
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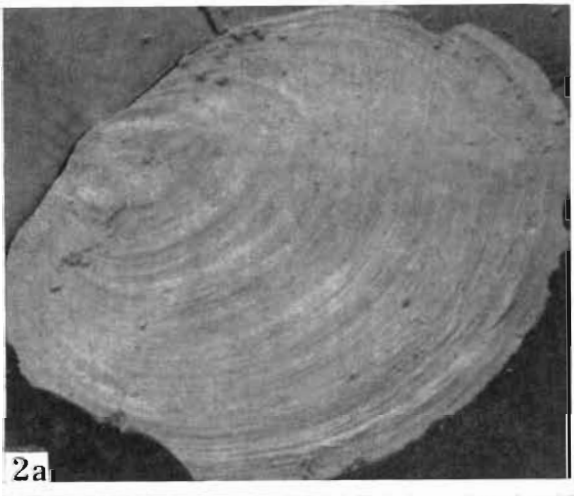
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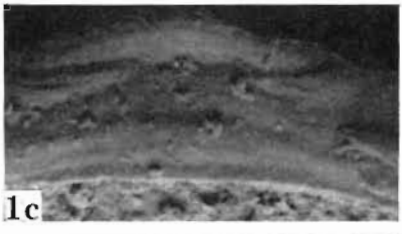
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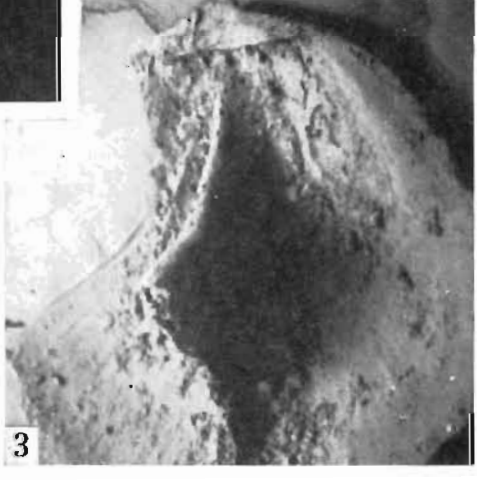
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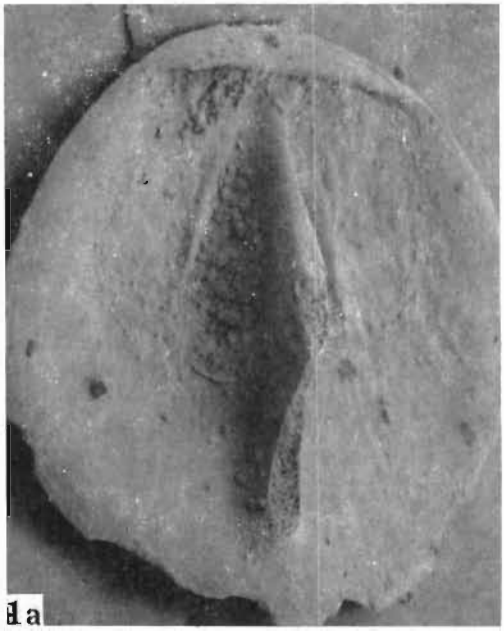
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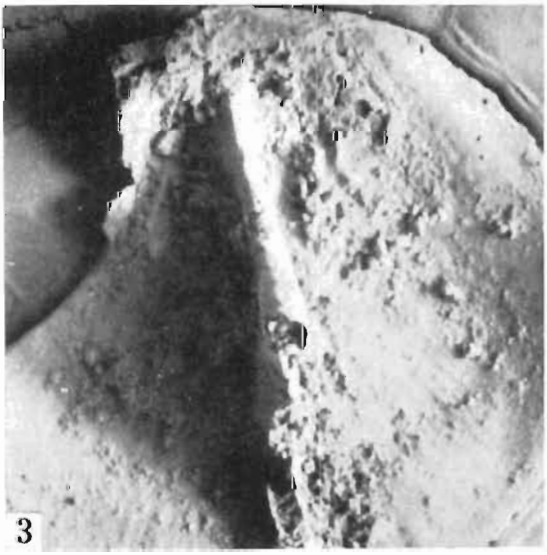
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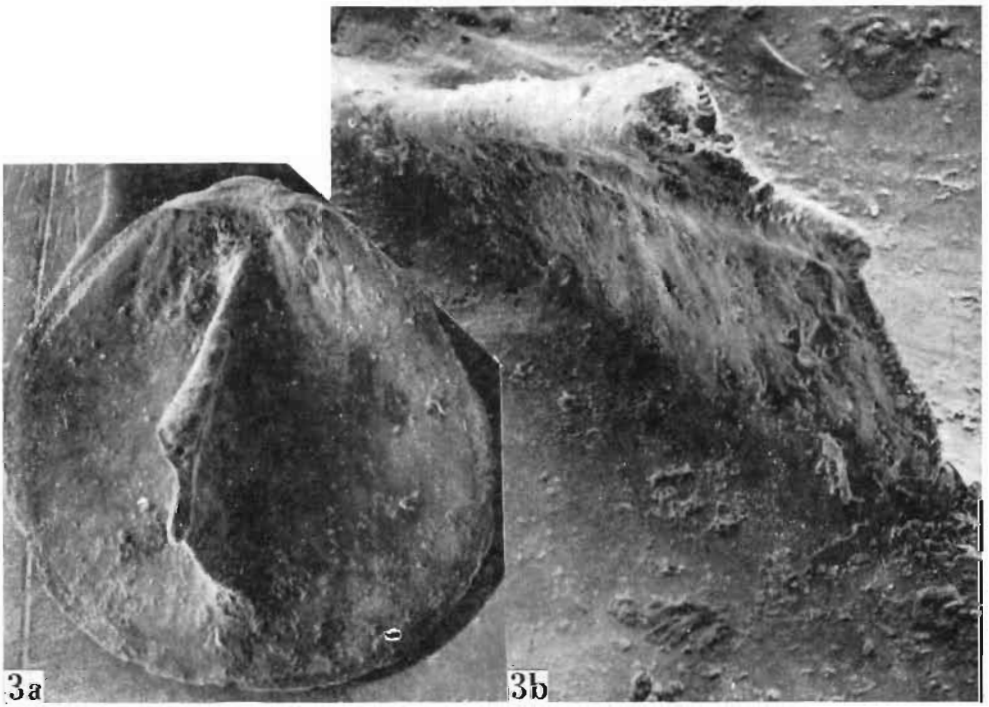
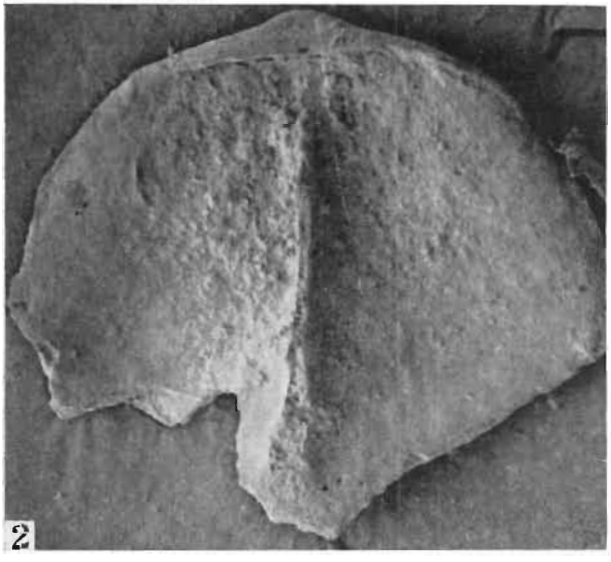

3a 3b


1a


1b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