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Brachiopods from the Korytnica basin (Middle Miocene; Holy Cross Mountains, Poland)

ABSTRACT: Within the brachiopod assemblage collected from the Korytnica basin (Middle Miocene) on the southern slopes of the Holy Cross Mountains, Central Poland, diverse species of the genera *Lingula* Bruguière, *Terebratula* O. F. Müller, *Argyrotheca* Dall, and *Megathiris* d'Orbigny have been distinguished. Most of the species are represented by juvenile specimens, whilst the adults are subordinate. Consequently, it is suggested that the Korytnica basin to which the brachiopod larvae had been transported by currents, was an unfavourable environment for their further development.

INTRODUCTION

In the rich assemblage of diversified fossils encountered within the Korytnica basin (Middle Miocene; southern slopes of the Holy Cross Mountains, Central Poland), the brachiopods are an accessory element (*cf.* Bałuk 1975, Bałuk & Radwański 1977). The heretofore reports concern the occurrence of *Lingula* cf. *suessi* Dreger and *Terebratula* cf. *grandis Blumenbach,* noted by Kowalewski (1930) and Friedberg (1930), and of the genera *Megathiris* and *Cistella* [= *Argyrotheca*] recently stated by Bałuk (1975).

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THE INVESTIGATED MATERIAL

The brachiopod assemblage of the Korytnica basin (*cf.* Text-fig. 1) is composed mostly of the representatives of the genus *Argyrotheca* Dall, whilst those of the genera *Megathiris* d'Orbigny, *Terebratula* O. F. Müller and *Lingula* Bruguière are subordinate.

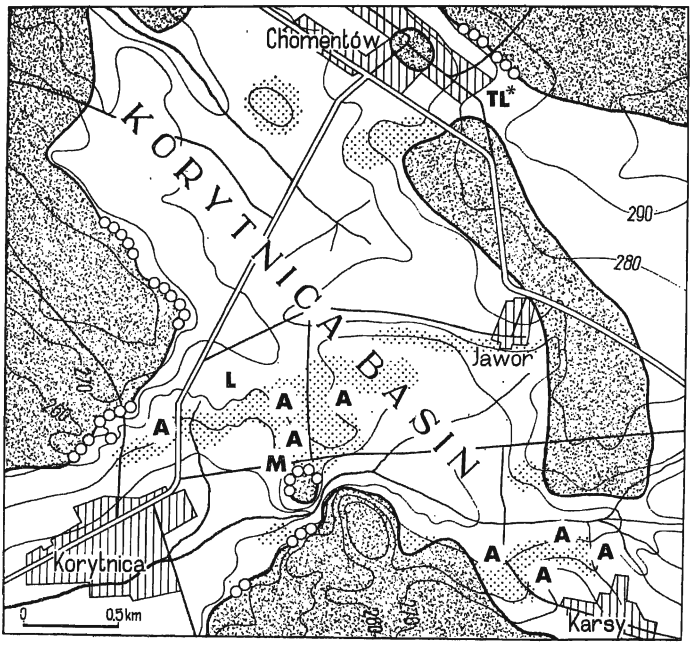


Fig. 1. Peleoenvironmental sketch of the Korytnica basin (from: Bałuk & Radwański 1977, Text-fig. 2)

Indicated are: marine area of the Korytnica basin during the Middle Miocene (Badenian) transgression (blank) and present-day outcrops of the Korytnica Clays (*stippled*); preserved fragments of littoral structures (*circled*); land or island areas along the seashore (*hachured*)

Marked are the occurrence sites of the brachiopods investigated

From the Korytnica Clays: *A* — *Argyrotheca*

From oyster lumachelles: *M* — *Megathiris*

From marly sands: *L* — *Lingula* (asterisked is the site of *Lingula* cf. *suessi* Dreger reported by Friedberg 1930)

From red-algal (lithothammian) limestones: *T* — *Terebratula*

The preservation state of the collected specimens is variable. The worst preserved are large specimens of *Terebratula styriaca* Dreger from the red-algal (lithothamnian) limestones; they are usually compressed (*cf.* Pl. 2, Fig. 10) and their brachial elements are damaged (cf. Text-fig. 3). The best preserved are juvenile specimens of *Argyrotheca cistellula* (S. Wood) and *A. subcordata* (Boettger) from the Korytnica Clays; their shells are often empty, and both septum and even fragments of the loop are recognizable (*cf.* Pl. 1, Figs 1—2, and Pl. 2,

Figs 2—4). Most of these small specimens were obtained from large gastropod shells which acted (*cf.* Jakubowski 1972, p. 48; Bałuk & Radwański 1977) on the sea bottom as local traps for the transported organic debris.

The most common brachiopod genus that occurs in the Korytnica Clays, *Argyrotheca* Dall, is represented primarily by minute specimens. Judging from the characters of their shells, as it is known (*cf.* Morgan 1915, Cooper 1954) in the family Megathyrididae, they represent juvenile individuals. Some of them are so young that hardly distinguishable from the juveniles of the genus *Megathiris* d'Orbigny; the same as noted by Atkins (1960) for the Recent forms. In other specimens, the presence of one median septum in the dorsal valve, the knob of cardinal process and submarginal interior tubercles evidence (*cf.* Morgan 1915, Julien 1940, Cooper 1973a, b) that those really belong to *Argyrotheca.*

When taking into account that in the open-sea parts of the Holy Cross shores, mostly within the bryozoan-algal facies (*Leithakalk* type of the Vienna Basin), the adult specimens of both *Argyrotheca* and *Megathiris* are remarkably common [1], it is suggested that the Korytnica basin was rather an unfavourable environment for the brachiopods. Well prospering were only the genera *Lingula* and *Terebratula* which inhabited the basin during sedimentation of marly sands and red-algal (lithothamnian) limestones (*cf.* Text-fig. 1) making up the uppermost part of the Korytnica sequence (*cf.* Bałuk & Radwański 1977).

The investigated material is housed at the Laboratory of Paleozoology, Museum of the Earth (Polish Academy of Sciences), Warsaw, and kept under the Catalogue Numbers *MZVIII Bra 1204—1220.*

SYSTEMATIC DESCRIPTION

Family **Lingulidae** Menke, 1828

Genus *LINGULA* Bruguière, 1797

Lingula dumortieri Nyst, 1843

(Text-fig. 2 and Pl. 1, Figs 8—9)

1843. *Lingula Dumortieri* Nyst; P. Nyst, p. 337, Pl. 34, Fig. 4a—c.
1852. *Lingula Dumontieri,* Nyst; T. Davidson, p. 5, Pl. 1, Figs 10a, b, 11.
1874. *Lingula Dumontieri,* Nyst; T. Davidson, p. 13.
1892. *Lingula Dumortieri* Nyst; E. Vincent, p. 41.
1921. *Lingula* aff. *Dumontieri* Nyst; W. Friedberg, p. 5, Pl. 1, Fig. 1.

Material: Four, almost complete dorsal valves, and some fragments from marly sands at Korytnica.

Remarks. — The shape of valves, ornamentation and internal morphology are almost identical with those stated by Davidson (1852, p. 5) and Friedberg

[1] This bryozoan-algal facies is characterized in some localities (Pińczów, Busko, Szczaworyż — *cf.* Radwański 1969) by the presence of very common diverse brachiopods, mostly of the genera *Megathiris* d'Orbigny, *Megerlia* King, *Argyrotheca* Dall, *Terebratula* O. F. Müller, as well as subordinate *Platidia* da Costa, *Crania* Retzius, *Lingula* Bruguière and *Craniscus* Dall, the assemblage of which is the subject of a separate paper, prepared for the next volume of ACTA GEOLOGICA POLONICA.

(1921, p. 5). Noteworthy are muscle scars displayed by the dorsal valve (Text-fig. 2*a*—*c*): two transmedian scars (*a*), two central scars (*b*), and anterior pair of muscles (*c*) situated behind the cylindrical elevation. The studied specimens (length — 6.0—8.5 mm; width — 3.0—3.5 mm) are smaller than those described by Davidson (1852; length 25.5 mm, width 10.5 mm and Friedberg (1921; length 15.0 mm, width 5.5 mm). Friedberg's specimens from Podolia, determined as "*Lingula* aff. *dumortieri* Nyst" resemble rather *L. suessi* Dreger in size. Those from Korytnica display well discernible growth lines and poorly marked delicate radial striae. In *Lingula suessi*, the growth lines display tonguelike bends forward on the strongly marked lateral ridges (*cf.* Dreger 1889, Pl. 1, Figs 17—18); also radial striae are more distinct, as it is seen in the specimen from Chomentów (*cf.* Text-fig. 1) illustrated by Friedberg (1930, p. 374, Fig. 2). The investigated specimens of *Lingula dumortieri* resemble *L. tenuis* Sowerby in size of the valves, but they differ in lanceolate shape, less sharply pronounced hinge line and more rounded anterior margin.

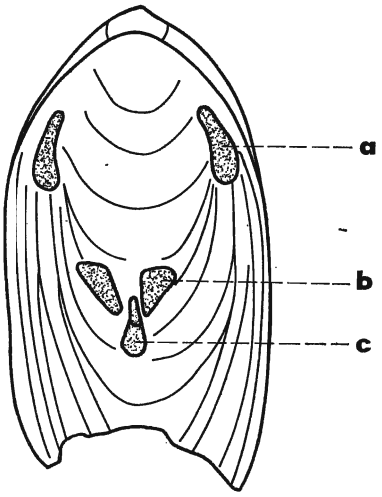


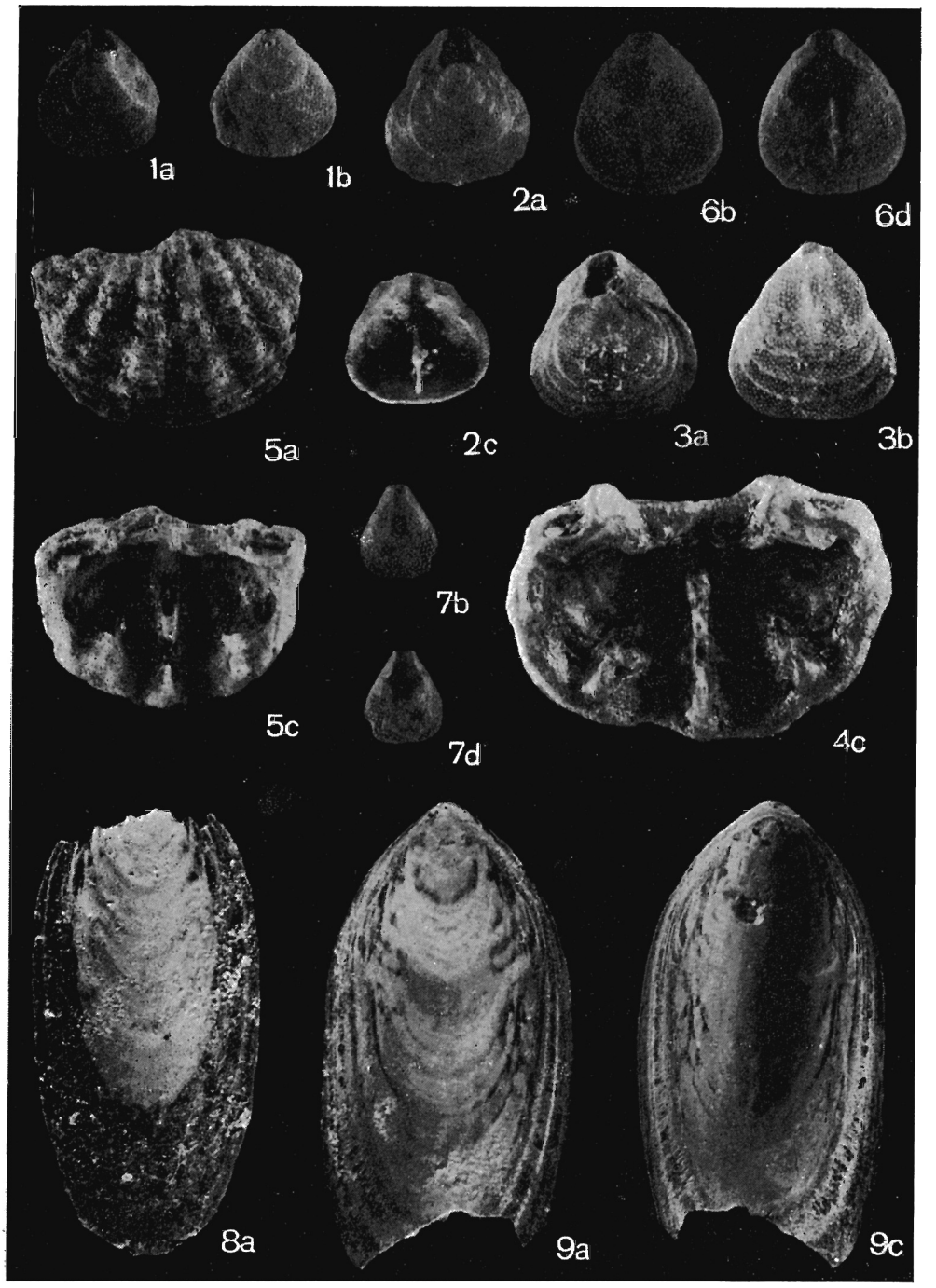
Fig. 2
Pattern of muscle scars in the dorsal valve of *Lingula dumortieri* Nyst from Korytnica (*cf.* Text-fig. 1); × *c* 10
a transmedian muscles, *b* central muscles, *c* anterior pair muscles

The identity of *Lingula dumortieri* Nyst with the Recent species *L. jaspidea* Adams living in the Japan Sea is an open question (*cf.* Davidson 1874); this Japanese species has been found at depth of 13 meters (Dall 1921, p. 265; Zezina 1976, p. 102).

Occurrence. — Miocene of the Lublin Upland, Poland (Popiel-Barczyk 1977) and of Podolia, Soviet Union (Friedberg 1921, Thomson 1927); Pliocene of Belgium (Davidson 1852, Vincent 1892, Thomson 1927) and England (Davidson 1852, Thomson 1927).

Family **Terebratulidae** Gray, 1840
Genus *TEREBRATULA* O. F. Müller, 1776
Terebratula styriaca Dreger, 1889
(Text-fig. 3 and Pl. 2, Fig. 10)

1889. *Terebratula Styriaca* n. sp.; J. Dreger, p. 187 (9), Pl. 3, Figs 1—6.
1924. *Terebratula styriaca* Dreger; W. Friedberg, pp. 562—563, Pl. 1, Figs 1—5.
1943. *Terebratula styriaca* Dreger 1899; I. Meznerics, p. 28, Pl. 5, Figs 1—7.
Material: Two damaged specimens from red-algal (lithothamnian) limestones at Chomentów.

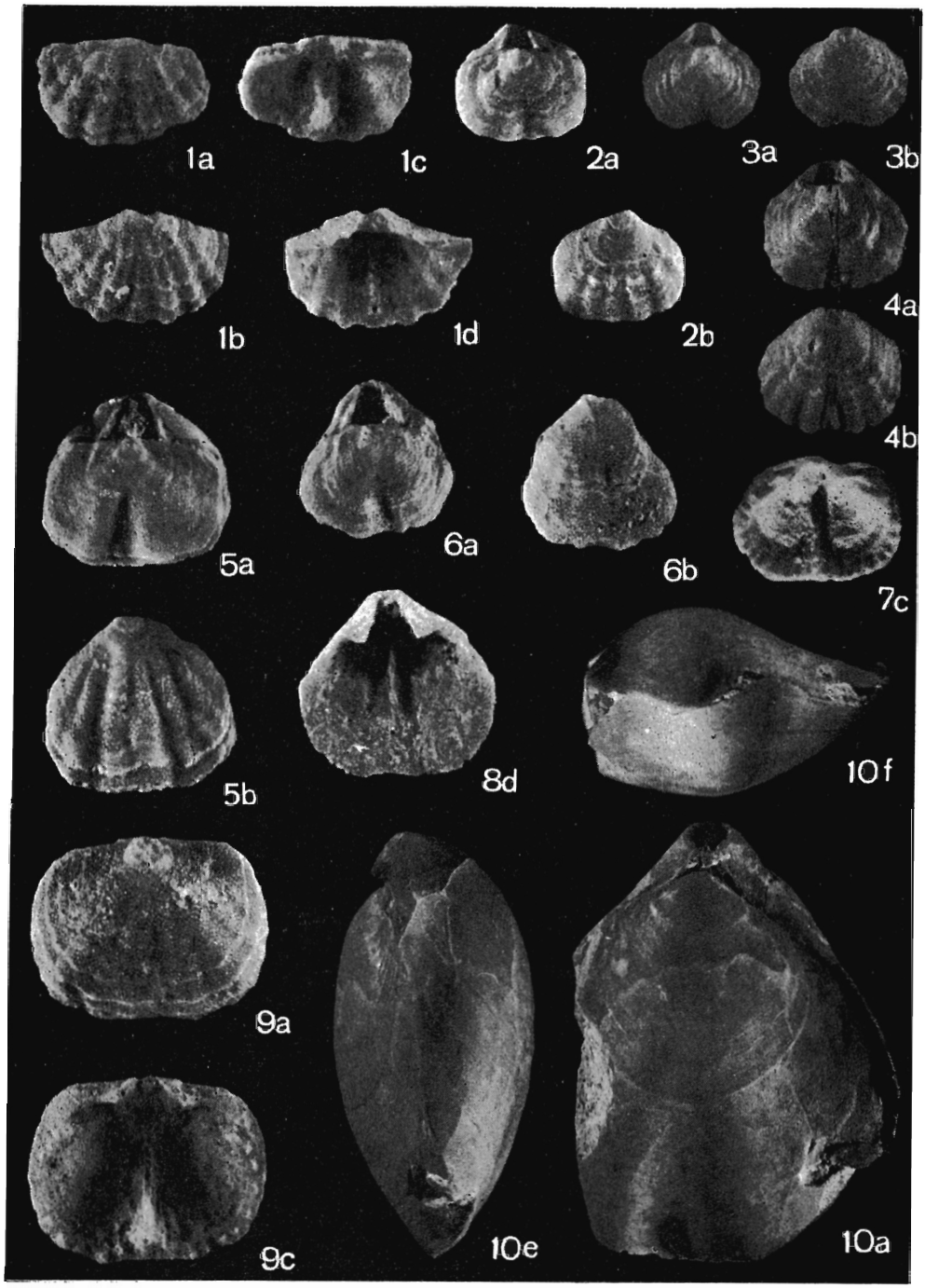


1—3 — *Argyrotheca cistellula* (S. Wood)
1 — juvenile specimen; *2—3* adult specimens (in *2c* visible are inner socket ridges, and median septum)

4—5 — *Megathiris detruncata* (Gmelin)

6—7 — *Argyrotheca* sp.
In *6d* visible are ventral septum and pedical collar; in *7d* — the teeth originating, and the pedical collar

8—9 — *Lingula dumortieri* Nyst; well discernible are the growth lines
In all figures: *a* dorsal valve view, *b* ventral valve view, *c* interior of dorsal valve,



1 — *Argyrotheca? squamata* (Eichwald)
2—9 — *Argyrotheca subcordata* (Boettger)

2—4 juvenile specimens; 5—9 adult specimens (in 7c visible are marginal tubercles, and median septum; in 8d – teeth and ventral septum; in 9c — knob of cardinal process and inner socket ridges)

10 — *Terebratula styriaca* Dreger; Chomentów, × 2

In all figures: *a* dorsal valve view, *b* ventral valve view, *c* interior of dorsal valve, *d* interior of ventral valve, *e* lateral view, *f* anterior view; all taken × *c* 10, unless

Supplementary description. — The internal morphology, recognized in serial transvere sections (Text fig. 3) displays the following characters: in the dorsal valve, developed is the hinge process with a broad and short myophore; *U*-shaped hinge plates are ventrally concave; inner hinge plates are narrow and short, separated from outer hinge plates by the crural bases, and they do not contact each other posteriorly; in the ventral valve the pedicle collar is present.

Remarks. — The investigated specimens in the character of anterior commissure resemble these from the Vienna Basin described by Dreger (1889) rather than those from Transylvania (*cf.* Meznerics 1943). Both the position and character of hinge plates (*cf.* Text-fig. 3) closely correspond to those presented by Dreger (1889, Pl. 3, Fig. 5*a*—*b*).

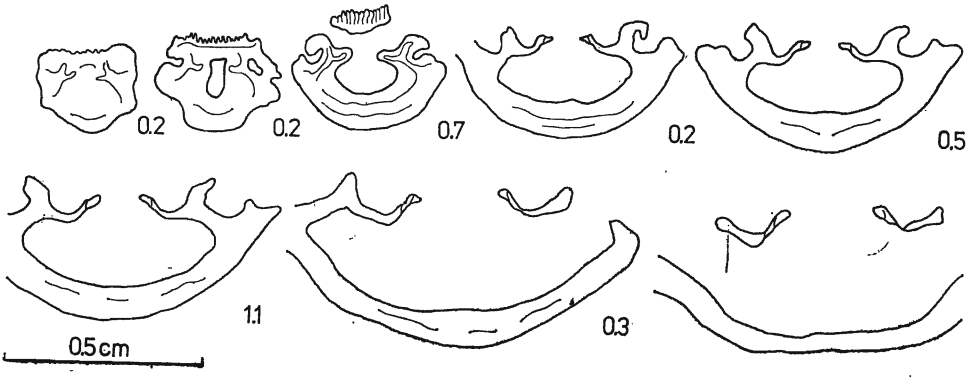


Fig. 3. Serial transverse sections of *Terebratula styriaca* Dreger from Chomentów (*cf.* Text-fig. 1), to show the hinge elements (cardinal process with myophor, and hinge plates); specimen No. *1205/1*

The investigated specimens differ from *Terebratula* cf. *grandis* Blumenbach, the only terebratulid species hitherto reported from the Korytnica basin (Kowalewski 1930, p. 72), in the character of biplication of the anterior margin, lesser convexity of both valves, and slightly different size ratios of the valves (*cf.* also Friedberg 1921).

Occurrence. — Miocene of the Vienna Basin (Dreger 1889) and Transylvania (Meznerics 1943); *Leithakalk* facies at Pińczów (Friedberg 1924).

Family **Megathyrididae** Dall, 1870
Genus *ARGYROTHECA* Dall, 1900

Argyrotheca cistellula (S. Wood, 1841)
(Pl. 1, Figs 1—3)

1852. *Argiope cistellula*, S. Wood; T. Davidson, p. 10, Pl. 1, Fig. 13a, b, c, d (*non* Fig. 2).
1883. *Cistella cistellula* Reeve; J. Morgan, p. 334.
1886. *Cistella cistellula*, Searles Wood sp.; T. Davidson, p. 139, Pl. 22, Figs 1—4.
?1901. *Cistella cistellula* (S. Wood); O. Boettger, p. 184.
1921. *Argyrotheca cistellula* S. Wood; W. H. Dall, p. 325.
1940. *Cistella cistellula* S. Wood; M. Julien, p. 50, Pl. 4, Figs 21—22.
Material: Eight complete shells; 7 dorsal and 4 ventral valves from the Korytnica Clays. *Dimensions* (length and width, *in* mm): Specimen *No. 1208/1* — 1.9 and 1.7; 1208/3 — 2.0 and 1.7; *1208/4* — 2.3 and 2.1; *1208/5* — 2.6 and 2.4.

Remarks. — External characters of the investigated specimens agree generally with those given by Davidson (1852) and Julien (1940). Dimensions,

character of growth lines and size of pores point to young individuals (*see* Pl. 1, Fig. 1). The submarginal tubercles situated near the anterior commissure, noted in other specimens (*cf.* Julien 1940, Pl. 4, Figs 21—22), are absent both on ventral and dorsal valve of the investigated specimens (Pl. 1, Fig. 2*c*). The median septum, triangular in shape and thickened at its top, does not stretch over the entire length of the valve as it is otherwise visible in specimens presented by Davidson (1852, Pl. 1, Fig. 13*c*). Hinge elements are almost devoid of cardinal process in the dorsal valve (*see* Pl. 1, Fig. 2*c*), although a small, knob-like elevation in one specimen is visible between the inner-socket ridges which may suggest an incipient cardinal process. Recent forms of *Argyrotheca cistellula* (S. Wood), as it can be seen in illustrations by Davidson (1852 and 1886), differ from fossil ones in having different shape of the dorsal valve in which the maximal width is at the hinge margin. The specimens of *Argyrotheca cistellula* (S. Wood) reported by Boettger (1901, p. 184) from the Miocene of Kostej in Transylvania, Rumania, are devoid of ribs, and their smooth shell and its shape supposedly correspond to this species; Meznerics (1943, p. 38) however does not confirm its presence in that region.

Occurrence. — (?)Miocene of Kostej in Transylvania, Rumania (*cf.* above); Pliocene of England (Davidson 1852, Thomson 1927), Sardinia and Sicily (Thomson 1927). At present the species occurs in the Mediterranean (Sardinia and Sicily) and in the Atlantic Ocean (from Norway to the Bay of Biskay) at depths 2—82 m (Thomson 1927, Zezina 1976).

Argyrotheca subcordata (Boettger, 1901)
(Pl. 2, Figs 2—9)

1901. *Cistella subcordata* n. sp:; O. Boettger, p. 185.
1934. *Cistella subcordata* Boettger; A. Zilch, p. 198, Pl. 1, Fig. 12.
1943. *Argyrotheca subcordata* (Boettger 1901); I. Meznerics, p. 37, Pl. 2, Figs 2—3.
Material: Twelve complete shells; 20 dorsal and 14 ventral valves from the Korytnica Clays.
Dimensions (length and width, *in* mm): Specimen No. *1207/1* — 1.5 and 1.8; *1207/2* — 1.6 and 1.8; *1207/3* — 2.0 and 2.2; *1207/4* — 2.2 and 2.2; *1207/5* — 2.6 and 2.8.

Supplementary description. — The shape of the shell, its ornamentation and the pedicle foramen agree with those noted by Boettger (1901) and Meznerics (1943). The greater number of the specimens allows to recognize some features of their internal morphology, as follows.

A small, tubercular cardinal process without myophore is present in the dorsal valve (Pl. 2, Figs 7*c* and 9*c*). Inner-socket ridges slightly protruding above the hinge margin separate deep, short dental sockets from the interior of the shell. The median septum stretches from the half-length of the shell till its anterior margin attaining there its maximal height. Anterior termination of the median septum is distinctly serrated with three indentations observable in most specimens. Internal side of the anterior margin of the shell exhibits rounded tubercles, the number of which varies from 8 up to 12. Small specimens which can be opened (Pl. 2, Figs 3—4) show less distinct, smaller tubercles. Muscle scars obervable under the hinge process. Ventral valve shows short, well developed triangular teeth. Pedicle collar is long and massive. Thin and low ventral septum stretches from the pedicle collar behind half of the valve length. Internal ornamentation of the anterior margin consists of longitudinal, cylindrical tubercles.

Remarks. — The investigated specimens, mostly smaller individuals (*see* Pl. 2, Figs 3—4), are similar both in shape and shell ornamentation to those described by Morgan (1915, p. 265) as *"Cistella plicata"* and *"C. pontileviensis"*. The dimensions of Morgan's specimens point to a very young age of individuals and their diagnostic characters are merely the shape and ornamentation of the shells. The species *A. subcordata* (Boettger) differs from *A. subcuneata* (Boettger) mainly in the even number of ribs that occur in the latter species on both valves

whereas in *A. subcordata* they are more distinct only on the ventral valve in uneven number of 5 or 7.

The investigated species, *Argyrotheca subcordata* (Boettger), seems to be closely related to the Recent species *Argyrotheca cordata* (Risso) which has however a complex taxonomy, as Dall (1921, pp. 327—328) and Thomson (1927, p. 211) included *Argyrotheca neapolitana* (Scacchi) into its synonymy. The ancient forms reported as *Argyrotheca neapolitana* should however be discussed as follows.

Namely, it seems probable that the interior of "*Cistella neapolitana* Sacchi" illustrated by Julien (1940, Pl. 4, Figs 17—18) can be regarded as identical to that of the investigated specimens of *A. subcordata*, whereas that of "*Cistella neapolitana* Scacc." described and illustrated by Dreger (1889, p. 185, Pl. 1, Fig. 8*b*) is different, as it shows 3 septa in the ventral valve.

The specimens of "*Cistella neapolitana* Scacchi" described from the Miocene of Podolia by Friedberg (1921, p. 16, Pl. 3 Fig. 13) were examined in the Friedberg collection (*No. 32/16687*): externally, they resemble small individuals of *Argyrotheca subcordata* (Boettger) from Korytnica. The ventral valves of "*Cistella zboroviensis* Friedberg" (*No. 32/16684*) and of "*Cistella dertomutinensis* Sacco(?)" (*No. 32/16685*) from the same collection, despite the fact that they resemble the investigated specimens both in their external and internal characters do not make a sufficiently documented material (lack of dorsal valves) to include them into the synonymy of *Argyrotheca subcordata* (Boettger).

Occurrence. — Miocene of Kostej in Transylvania, Rumania (Boettger 1909, Zilch 1934, Meznerics 1943).

Argyrotheca? squamata (Eichwald, 1830)
(Pl. 2, Fig. 1)

1830. *Terebratula squamata* m.; E. Eichwald, p. 203.
1850. *Terebr. squamata* m.; E. Eichwald, p. 44, 1851, Pl. 3, Fig. 12.
1889. *Cistella squamata* Eichw.; J. Dreger, p. 186 (8), Pl. 1, Figs 12—14.
?1902. *Cistella costulata* (Segu.); F. Sacco, p. 32, Pl. 6, Fig. 34.
1921. *Cistella squamata* Eichw.; W. Friedberg, p. 15, Pl. 3, Figs 8—10.
1943. *Agryrotheca squamata* (Eichwald 1853); I. Meznerics, p. 37.
Material: One dorsal and one ventral valve from the Korytnica Clays.
Dimensions (length and width, *in* mm): Specimen *No. 1206/1* — 1.6 and 2.5; *1206/2* — 1.8 and 2.5.

Remarks. — External and internal morphology of the investigated specimens correspond to those from the Miocene of the Vienna Basin (*cf.* Dreger 1889) and Italy (*cf.* Sacco 1902). The specimens studied do not show the presence of submarginal tubercles inside the dorsal valve. There are neither traces of such indentations on the anterior termination of the median septum, as they were illustrated by Dreger (1889, Pl. 1, Fig. 13*b*) nor the cardinal process. There is one median septum inside the dorsal valve which was recognized by Dreger (1889) and Sacco (1902).

The problem of internal morphology of the specimens from the Miocene of Volhynia described by the author of the species in his successive papers (Eichwald 1850, 1853) and from the Miocene of Podolia (Friedberg 1901, p. 15) needs some explanation. In the extensive description of "*Terebratula*" *squamata*, both in the Russian (Eichwald 1850, p. 44) and French text (Eichwald 1853, p. 55), he pointed out a resemblance of this species to "*T.*" *truncata* that lives at present in the Mediterranean, but in his Russian text he mentioned that the internal structure of the specimens from Żukowce (*cf.* Eichwald 1850, p. 45) is very similar to that of "*T.*" *detruncata* L.

The occurrence of the three septal elements in the dorsal valve in "*Cistella squamata* Eichwald" from Podolia was also noted by Friedberg (1921, p. 15). Eichwald's and Friedberg's remarks seem to be sufficient to place the species „*squamata*" in the genus *Megathiris* the more so as the only specimen of "*Cistella squamata* Eichwald" from Friedberg's collection (*No. 32/15/83*) is externally very similar to *Megathiris detruncata* (Gmelin). As far as the internal morphology of the *squamata* species from the type locality remains unknown, its generic assignation is doubtful. The identity of the species "*squamata*" with "*Cistella costulata* Seguenza" accepted by some authors (Sacco 1902, Meznerics 1943) is also an open question.

Occurrence. — Miocene of the Vienna Basin (Dreger 1889), Colli Torinesi in Italy (Sacco 1902), Kostej in Transylvania (Meznerics 1943), Volhynia (Eichwald 1850) and Podolia (Friedberg 1921).

Argyrotheca sp.
(Pl. 1, Figs 6—7)

Material: Two complete shells and 4 ventral valves from the Korytnica Clays.
Dimensions (length and width, *in* mm): Specimen No. *1210* — 2.5 and 2.1; *1211/1* — 1.4 and 1.2; *1211/2* — 2.4 and 2.1.

Remarks. — One complete specimen and one ventral valve, in their shell morphology and design of growth lines and character of coarse punctae, resemble "*Cistella puncticulata* Deshayes" from the Miocene of Belgium and France (*cf.* Vincent 1892, p. 63, Pl. 4, Figs 11—14). Two ventral valves exhibit well developed teeth and the pedical collar; the larger valve has also a rudimental ventral septum. Remarkable is a well developed pedicle collar in ventral valves and in the smaller one in particular (Pl. 1, Fig. 7) where its length is almost 1/4 of the whole valve[2]. The characters of the valves evidence their young age; it is difficult however to ascertain whether these belong to *Argyrotheca puncticulata* (Deshayes) or to any other species of *Argyrotheca*. It is also possible that these may belong to *Megathiris detruncata* (Gmelin) in which, as it was shown by Atkins (1960, p. 476, Fig. 10*E*), the teeth are already developed in specimens of the shell length attaining only 0.97 mm.

Genus *MEGATHIRIS* d'Orbigny, 1847
Megathiris detruncata (Gmelin, 1790)
(Pl. 1, Figs 4—5)

1886. *Argiope decollata,* Chemnitz sp.; T. Davidson, p. 128, Pl. 21, Figs 30—35
1889. *Argiope decollata* Chemnitz; J. Dreger, p. 183 (5), Pl. 1, Figs 1—5.
1901. *Megathyris praecursor* n. sp.; O. Boettger, p. 184.
1902. *Megathyris decollata* (Chemnitz); F. Sacco, p. 30, Pl. 6, Figs 4—12.
1921. *Megathyris detruncata* Gmelin; W. H. Dall, p. 330.
~~1921. *Megathyris decollata* Chemnitz; W. H. Dall, p. 331.~~
1921. *Megathyris decollata* Chemn. var. *austriaca* Dreg.; W. Friedberg, p. 14, Pl. 3, Fig. 7.
1927. *Megathyris detruncata;* I. A. Thomson, p. 213, Fig. 63.
1934. *Megathyris praecursor* Boettger; A. Zilch, p. 198, Pl. 1, Fig. 11.
1940. *Megathyris decollata* Chemnitz; M. Julien, p. 48, Pl. 4, Figs 9—13.
1943. *Megathiris decollata* (Chemnitz 1785); I. Meznerics, p. 38, Pl. 2, Figs 1, 5, 8.
1943. *Megathiris decollata* Chemn. var. *praecursor* Boettger 1901; I. Meznerics, p. 39.
1960. *Megathyris detruncata* (Gmelin); D. Atkins, pp. 459, 476, Figs 10—11.
Material: Three dorsal valves of adult specimens from the oyster lumachelles being a littoral facies of the Korytnica Clays at Korytnica (*cf.* Text-fig. 1).
Dimensions (length and wdth, *in* mm): Specimen No. *1212/1* — 4.0 and 5.5; *1212/2* — 3.5 and 5.0; *1212/3* — 3.0 and 4.0.

Remarks. — Two larger valves from Korytnica show best similarity to these from the Vienna Basin (*cf.* Dreger 1889) and Podolia (*cf.* Friedberg 1921) both in their shape and ornamentation. Some specimens from the Vienna Basin (*cf.* Dreger 1889; Pl. 1, Fig. 1) were subsequently regarded by Sacco (1902, p. 30), and Friedberg (1921, p. 14), as a separate variety "*austriaca*", the authorship of which was ascribed by them to Dreger. Both Dreger (1889) and Meznerics (1943) described 5 septa inside the dorsal valve out of which three (one central and two

[2] Similar characters in young specimens of Recent *Pumilus antiquatus* Atkins of the family Kraussinidae from New Zealand were observed by Atkins (1958, p. 561, fig. 2).

lateral) are stronger and better developed, and the two outer septa are rudimentary. The specimens under study do not possess even incipients of outer septa and the two lateral ones are definitely shorter than the central one. The myophor of the cardinal process is distinctly marked, but the knob is not developed as it is the case of the Recent forms.

The shape and ornamentation of the smallest valve from Korytnica are most similar to those from Kostej described by Boettger (1901) as a new species *Megathyris praecursor*, the smaller dimensions of which, lesser number of ribs and the number of septa inside both valves were used as sufficient characters to establish a new species differing from the Recent *M. decollata* (Chemnitz). Meznerics (1943) reported the Boettger's species "*praecursor*" as a variety of *M. decollata* (Chemnitz). Dall (1921, p. 331) regarded the species *decollata* Chemnitz and *detruncata* Gmelin as synonyms and proved the validity of the specific name given by Gmelin (*cf.* also Thomson 1927, p. 23).

The species *Megathiris detruncata* (Gmelin) shows great variability of the shape of shells and their ornamentation, which was used by Sacco (1902) as the basis in establishing several varieties among the specimens from Colli Torinesi.

Occurrence. — Miocene of the Lublin Upland, Poland (Krach 1950), Vienna Basin (Dreger 1901), Colli Torinesi, Italy (Sacco 1902), Podolia, Soviet Union (Friedberg 1921), and Kostej in Transylvania (Meznerics 1943). Recent forms are known from the Mediterranean and from the Atlantic Ocean (from Jersey Islands to Madeira) at depths 30—288 m (Zezina 1976).

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RAMIENIONOGI Z BASENU KORYTNICY

(Streszczenie)

Praca przedstawia charakterystykę zespołu ramienionogów występujących w różnych osadach mioceńskiego basenu Korytnicy (*por.* fig. 1 oraz Bałuk & Radwański 1977). W zespole tym (*por.* fig. 2—3 oraz pl. 1—2) rozpoznano obecność siedmiu gatunków należących do rodzajów: *Lingula* Bruguière, *Terebratula* O. F. Müller, *Argyrotheca* Dall i *Megathiris* d'Orbigny. Zwrócono uwagę, że w badanym zespole, w obrębie dominującego rodzaju *Argyrotheca* znajdowanego w iłach korytnickich, przeważają osobniki młode, zaś formy dorosłe stanowią zdecydowaną mniejszość. Wysunięto na tej podstawie przypuszczenie, że w basenie korytnickim, do którego larwy przenoszone były prądami ze stref morza otwartego (obszar Pińczowa, Buska i Szczaworyża), panowały w czasie sedymentacji iłów korytnickich warunki niedogodne dla rozwoju ramienionogów.
