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Sedimentology, benthic communities, and brachiopods in the Suchomasty (Dalejan) and Acanthopyge (Eifelian) Limestones of the Koněprusy area (Czechoslovakia)

Sedimentologie, bentická společenstva a ramenonožci suchomastských a akantopygových vápenců (dalej-eifel) koněpruské oblasti

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Abstract: Sedimentary structures and composition indicate that the two units Suchomasty and Acanthopyge Limestones deposited in shallow-water environment of the carbonate platform in the Koněprusy area. In the first unit (Suchomasty Limestone) water agitation and depth varied from place to place, but the depth did not exceed several tens of metres. Extremely shallow-water environment of deposition of the Acanthopyge Limestone corresponds also to carbonate platform with sedimentation of bahamites in flat depressions. Brachiopod communities of the Suchomasty and Acanthopyge Limestones clearly differ from the perireefal communities of the Koněprusy Limestone (Pragian) because they contain mainly smooth and weakly plicate spire-bearing brachiopods. In the Koněprusy Limestone, on the other hand, strongly costate and costellate shells prevail. Benthic fauna of the Suchomasty Limestone was assigned to the *Karbous-Orbitoproetus* and *Orbitoproetus-Scabriscutellum* Communities, the shelly fauna of the Acanthopyge Limestone is attributed to the *Karbous-Acanthopyge* Community. In the Suchomasty and Acanthopyge Limestones, 55 genera of articulate brachiopods were recognized; out of them, *Mamutinetes (Chonetacea), Lysigypa (Cypidulacea), Trigonatrypa, Cerberatrypa, Radimatrypa (Atrypacea),* and *Rochtex (Gyrtiacea)* are erected as new genera. Further, 30 species were described as new; the *Bojothyrididae* is a new family of the *Spiriferacea.*

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Introduction

Sedimentological and biostratigraphical concepts of the Koněprusy area (Barrandian, Central Bohemia) have changed several times during the last fourty years. Present concept of stratigraphy (see fig. 2) is based mainly on Chlupáč's studies (1955, 1957, 1959). The pink Vinařice and reefal Koněprusy Limestones are of Pragian age; the reddish Suchomasty Limestone has been assigned to the Dalejan; only the Acanthopyge Limestone is of Middle Devonian (Eifelian) age.

The lithostratigraphic units in the Koněprusy area differ in their structures, textures, petrological and chemical composition and also in their depositional environments. For this reason, also the benthic faunas are different in each lithostratigraphic unit. Brachiopods represent a significant component of the benthic fauna; in the last three decades, several papers were devoted to the brachiopods of the Koněprusy Limestone whereas those of the Suchomasty and Acanthopyge Limestones remained for a long time beyond main interest of palaeontologists. For this reason, the present paper deals with benthic communities and brachiopods of the Suchomasty and Acanthopyge Limestones. As the benthic communities are closely related to the sediment composition and depositional environment the chapter about sedimentology of the two units is also added.

Abbreviations: L — length; W — width; T — thickness; bv — brachial valve; pv — pedicle valve; sh — shell; ia — interarea; su — sulcus.

Abbreviations used in brachiopod collections: letter L preceding the catalogue number: collection of the National Museum, Prague. Letters VH preceding the catalogue number: collection of Vladimír Havlíček (it is being prepared for deposition in the Museum at Rokycany, Czechoslovakia).

Sedimentology of the Suchomasty and Acanthopyge Limestones

(Z. Kukal)

Structures, textures, petrological, mineralogical and chemical composition of the limestones were studied on the basis of about 300 thin sections and several dozens of metres of split and polished drill cores. Fresh samples from the two units were obtained from numerous outcrops and quarries in the Koněprusy area and also from many boreholes. Geological investigation of this area was accompanied by a complex drilling programme in several stages. Several hundreds of metres of cores penetrated the Suchomasty and Acanthopyge Limestones and

halved and polished cores offered a good opportunity to study sedimentary structures. Depositional environment of limestones was reconstructed from sedimentological data based on modern investigation of standard microfacies, facies belts and comparison with recent carbonate depositional environments.

The Suchomasty Limestone

The Suchomasty Limestone consists of limestones which are generally red with various shades of reddish-brown, pink, purple and sometimes also greenish, greyish, whitish and bluish. Due to the presence of a stromatactis structure this limestone is often mottled and variegated. For their colour effects and remarkable structures these limentones are industrially used for decoration purposes. Several types of "marbles" have been quarried in this area and used and even exported abroad under various denominations, e.g. Rouge Antique, Rouge Nationale, Cardinal, Pink Marble, Blue Stone, etc.

Structures

The Suchomasty Limestone consists of very heterogeneous limestones from the point of view of sedimentary structures. Colours and also their grain sizes are strongly variable. Rapid alternation of coarser bioclasts and finer biomicritic portions is typical feature of these limestones. Accumulations of coarse bioclasts form lenses and streaks which pass quickly into micritic layers. Stromatactis structures are very common. They were described in detail by Kukal (1972). They are mostly elongated, often bound to veins and fractures which are parallel or subparallel to the bedding. Some stromatactis structures have internal sediment within their secondary sparite. Some coarser bioclastic lenses display traces of current bedding.

Nodular structure is partly developed in reddish-brown micritic portions, but not in mature form. Various sutures and seams coated with clayey insoluble residue are very common. They pass sometimes into stylolites with small amplitude. Large sutures pass into a minor network of microsutures which are also coated with clay and iron compounds. Many sparitic veins and veinlets are developed being often connected with stromatactis. All these features speak in favour of intensive pressure solution.

Primary sedimentary structures indicate rapidly changing current activity, i.e. high-energy stages alternating with low-energy sedimentation.

Bottom currents might have been temporarily very intensive. Secondary structures indicate large-scale pressure solution. Numerous dissolution seams which are oriented paralelly to the bedding indicate that this could have been caused by deeper burial. This is, however, not in accordance with the present geological situation. Internal sedimentation also indicates fossil karstification which occurred prior to the deposition of the overlying Acanthopyge Limestone. Well known deep and branching fissures in the underlying reefal Koněprusy Limestone indicate karstification of the surface of the carbonate platform before the deposition of the Suchomasty Limestone. These fissures, described in detail by Chlupáč (1955, 1957) are developed as clastic dikes filled from above by the material of the Suchomasty Limestone. Dike-filling limestones display the same structures and textures as the bulk of the overlying rocks.

Limestone textures

The Suchomasty Limestone displays only small variability of textures. Bioclastic limestones of varying grain size and variable micrite admixture strongly predominate. All the 150 microscopically investigated samples were classified according to Folk (1962). Percentages of the individual types are as follows:

Sparse biomicrite	42 %
Packed biomicrite and poorly washed biosparite	28 %
Sorted and rounded biosparite	17.5 %
Fossiliferous micrite	12.5 %

(rounded biosparite is very rare and thus is added to the class of sorted biosparite).

Dunham's (1962) classification was also applied. Most of the limestones are mud-supported which means that wackestones and even mudstones prevail. Minor amount of grain-supported packstones follows. Grainstones are very rare. Coarser types such as floatstones (matrix-supported) and rudstones (particle-supported) are present in variable quantities.

Among allochems bioclasts strongly prevail. Smaller amount of intraclasts (lime mud fragments of small size) also occurs. Neither ooids nor pellets and lumps were found. Coated grains are absent. Micritization of bioclasts is almost missing. Bioclasts are represented mostly by crinoid stems (some of them attain even centimetre size across). Some brachiopods, pelecypods, trilobites, bryozoans, ostracodes and unidentified bioclast fragments also occur. Whole-skeletal fossils are also present, mostly

brachiopods and trilobites. Fragmentation of bioclasts is common, but rounding of fragments is negligible. Mixing of fragments by burrowing (bioturbation) was observed but was never too distinct.

Standard microfacies and facies belts (after Wilson 1975)

The limestones belong generally to SMF 8 (Wilson's description: bioclastic wackestone or bioclastic micrite, almost invariably sediment-containing fragments of diverse organisms jumbled and homogenized through burrowing). Compared to Wilson's (1975) description, micritization is almost missing in the Suchomasty Limestone and bioturbation is not too pronounced. Description of Wilson's Facies Belt No 4 fits well to the investigated limestones: open marine platform facies (shallow undathem), which is characterized by an environment in straits, open lagoons, and behind the outer platform edge water depth was generally shallow, a few tens of metres at most. Salinity varied from essentially normal marine to somewhat variable. Circulation is moderate. Several samples, however, belong to SMF 4 (of the same Facies Belt): coarse lithoclastic rudstone or floatstone (with some bioclasts).

Mineralogy and chemistry

Mineralogical composition of the limestones is very simple. Out of carbonate minerals only calcite was found. In the insoluble residue, apart from quartz, potassium feldspar, kaolinite and illite also haematite was found. Dolomite was not identified neither in thin section nor by X-ray investigation. Chemical analyses, however, show that some minor amounts of dolomite might be present (see 0.90 % MgO, table 1). Authigenic silica is almost absent. Microscopically slight silicification of some bioclasts was observed but this is rather an exception. From the chemical analyses it follows that higher amounts of silica correspond to higher amounts of alumina and are thus bound to clay minerals.

Chemical analyses are tabulated in table 1.

The amount of insoluble residue is variable, indicating changing admixture of clay minerals. Some higher amounts of iron oxide were found (up to 1.24 %). The iron oxide percentage can be positively correlated with the alumina and silica contents. This means that all impurities can be associated with the secondary pressure-solution effects and leaching of carbonate. Some iron, as described by Kukal (1964), is primary

Table 1

Chemical analyses of the Suchomasty Limestone from the Koněprusy area (mass %)

Borehole	Depth (m)	Ignition loss	SiO_2	Al_2O_3	Fe_2O_3	TiO_2	CaO	MgO	MnO	P	Na_2O	K_2O
V-101	25.0—26.0	42.14	1.45	0.79	0.48	0.06	53.97	0.52	0.02	tr.	0.15	0.23
	37.4—37.7	40.62	3.09	1.63	1.24	0.24	51.67	0.73	0.07	tr.	0.16	0.44
	41.2—42.2	40.94	2.23	1.26	0.81	0.13	53.04	0.83	0.01	tr.	0.16	0.34
V-102	18.3—19.0	42.80	0.51	0.27	0.32	0.04	54.64	0.62	0.01	tr.	0.15	0.08
	21.0—21.8	42.50	0.79	0.27	0.41	0.04	54.36	0.62	0.01	tr.	0.18	0.13
	28.0—28.8	42.82	0.78	0.25	0.45	0.08	54.50	0.94	0.01	tr.	0.15	0.09
	42.1—42.8	42.31	0.74	0.36	0.50	0.09	54.78	0.31	0.01	tr.	0.15	0.12
	44.3—44.9	43.02	0.31	0.21	0.19	0.04	55.51	0.31	0.01	tr.	0.15	0.06
	47.0—48.0	42.66	0.14	0.19	0.16	0.08	55.80	0.42	0.01	tr.	0.16	0.10
V-103	7.0—7.70	42.93	0.22	0.27	0.53	0.08	54.84	0.42	0.01	tr.	0.16	0.10
V-104	7.2—7.6	41.92	1.22	0.82	0.82	0.11	53.97	0.42	0.01	tr.	0.21	0.17
V-105	44.0—45.0	43.33	0.80	0.51	0.29	0.04	53.54	0.29	0.01	tr.	0.18	0.13

Analysed by B. Měřilová et al. in the Laboratories of the Geological Survey, Prague.

Table 1 (*continued*)

Locality	Type of limestone	Insol. res.	CaO	MgO	Fe_2O_3	Al_2O_3	CO_2	H_2O^-	$CaCO_3$	$MgCO_3$
Císařský quarry	red bioclastic	1.40	54.15	0.82	0.13	0.07	43.40	0.10	96.95	1.72
Císařský quarry	red biomicritic	1.48	53.64	0.94	0.33	0.25	43.11	0.18	95.73	1.96
Husák quarry	red biomicritic	2.00	54.03	0.46	0.30	0.17	42.89	1.18	96.42	0.96
Husák quarry	red bioclastic nodular	7.41	50.51	0.63	0.30	0.40	40.31	0.38	90.14	1.31
Husák quarry	pink biomicritic (pink marble)	2.19	52.46	0.74	0.15	0.11	44.16	0.15	95.81	1.55
Červený quarry	deep red biomicritic (Cardinal marble)	4.32	51.83	0.69	0.85	0.39	41.42	0.38	92.50	1.44
Červený quarry	deep red biomicritic nodular	7.86	49.14	0.90	1.15	0.87	39.55	0.44	87.70	1.89
Červený quarry	whitish bioclastic (snow marble)	1.20	54.10	0.88	0.06	0.07	43.41	0.22	96.55	1.84
Červený quarry	variegated biomicritic (blue stone)	5.84	51.45	0.55	0.22	0.29	40.97	0.27	91.82	1.15

Analysed by I. Švasta et al. in the Laboratories of the Geological Survey, Prague.

and in form of haematite particles trapped in the open porous network of crinoids. Secondary redistribution and concentration of iron was affected by intensive pressure solution.

Environmental reconstruction

Judging from the primary structures and textures, from the mineralogy, standard microfacies and facies belt reconstruction it could be stated that the bulk of the Suchomasty Limestone unit deposited in very shallow water, temporary agitated, temporary quiet. Bioclasts are poorly washed and not rounded, and they sedimented in depressions on the carbonate platform the surface of which was formed by the underlying Koněprusy Limestone. The water agitation and depth varied from place to place, but the depth generally did not exceed several tens of metres. The limited water agitation could be explained by conditions far from the high-energy margin of carbonate platform.

Total absence of ooids, and even cortoids and coated grains tried to explain Kukal (1964), but the final evidence is still missing. Absence of ooids is connected with the lack of pellets and lumps in the whole sequence of the Barrandian Palaeozoic limestones. Could it have been caused by slightly lower salinity on the carbonate platform, near their outer parts? The proper reason, however, is not yet known.

Rocks of the Suchomasty Limestone unit belong to the carbonate red beds which are comparatively abundant among the Barrandian Palaeozoic limestones. The members of these red beds are either of bioclastic or of micritic nature. According to Kukal (1964) red components consist both of haematite and iron oxihydrates and come mostly from the lateritically wheathered source areas.

The Acanthopyge Limestone

The Acanthopyge Limestone was sampled in quarries and natural outcrops in the Koněprusy area and also in numerous boreholes which were drilled during the investigation of industrial high-percentage limestones. The Acanthopyge Limestone unit is far more homogeneous than the underlying Suchomasty Limestone. Its colour is mostly whitish and greyish.

Structures

Several boreholes displayed vertical alternation of coarse-grained bioclastic and fine-grained, prevalently micritic limestones. Nodular structu-

re is not developed, some sutures and stylolites were found but they are not so markedly developed as in the underlying limestones. Stromatactis is present, but the open spaces are usually of minor size, passing into bird's-eye structure. Some parts of the sequence are densely fissured, fissures being of variable thickness and different generations. In general, the Acanthopyge Limestone lacks abundant traces of intensive pressure-solution. Some whole-skeleton fossils are present in streaks and scattered within the micrite matrix.

Limestone textures

120 thin sections display only smaller variability of textures. Two of them can be defined, bioclastic and biomicritic (together with micritic). These types are intimately associated. Bioclastic limestones are sometimes very coarse-grained with crinoid stems of cm size. Some other allochems are also present, namely intraclasts made of micrite mud, which might be also of cm-size and sometimes give the rock breccia-like appearance.

The calculation of bioclasts in all the sections gave the following averages:

crinoids	51 %
brachiopods	14 %
trilobites	6 %
bryozoans	12 %
corals	9 %
ostracodes	2 %
sponges	2 %
others (algae ?)	4 %

Two associations can be recognized; the first one represented by coarser bioclastic limestone with crinoid-brachiopod-trilobite association and the second one represented by biomicrite with ostracode-sponge association. There exists also the third type of limestone which possesses increased amounts of bryozoans and corals but this type is comparatively rare.

The Acanthopyge Limestone is also characterized by the presence of lumps which have usually 0.2—1.5 mm across. Sometimes internal structure can be recognized having an appearance of several smaller lumps welded together. The outer outlines of lumps are sometimes sharp, sometimes hazy. Occasionally whole lumps are recrystallized into microsparite and only darker rim divides them from the matrix. These lumps strongly resemble grapestones described by Beales (1958) from Bahamas and

later by many other authors. Secondary textures are also very common in the finer varieties of the limestones. Their matrix is generally recrystallized into clotty (grumeleux) texture. The clasts have generally hazy boundaries and their size is between the limits of 0.05—0.1 mm. Similar clasts might signify, as it is well known, presence of faecal pellets, algae or simply differential recrystallization of micrite into microsparite (Flügel 1982). In this case, the origin by recrystallization is favoured.

Standard microfacies and facies belts

The bulk of the Acanthopyge Limestone belongs to the SMF 8, the same as in the case of the Suchomasty Limestone. There is, however, also another microfacies present — SMF 17 which is rather unique among the Palaeozoic Barrandian limestones. According to Wilson (1975) this SMF is characterized as mixed facies of isolated peloids, agglutinated peloids, some coated particles and lumps which are in part small intraclasts. Typical representatives of this microfacies are bahamites with their grapestones (Beales 1958) deposited in extremely shallow water with only moderate circulation.

The two microfacies (SMF 8 8 and 17) indicate shallow-water environments and their association means rapid change of high-energy and low-energy environments.

Mineralogy and chemistry

Two samples of the Acanthopyge Limestone from Zlatý kůň hill contain small amounts of aragonite, as recognized by X-ray method (Kukal 1966). These samples are characterized by grapestone texture, they contain neither open-space structures nor secondary sparite. This means that aragonite is primary and represents a relic of primary aragonite deposited in bahamites. It is well known that relics of primary aragonite can be preserved even in Lower Palaeozoic and Proterozoic limestones provided they contained micrite and possibly also higher amounts of organic matter.

Dolomite was not found in the Acanthopyge Limestone, neither microscopically nor roentgenographically, even though the percentages of MgO (see table 2) might indicate that some traces were present. Authigenic silica is present as impregnations of fossils and also in sponge spicules. Samples of insoluble residue (obtained by solution in 5 % HCl) contain great amount of quartz of silt size, only few grains of quartz of sand

Table 2

Chemical analyses of the Acanthopyge Limestone from the Koněprusy area (mass %)

Borehole	Depth	Ignition loss	SiO_2	Al_2O_3	Fe_2O_3	TiO_2	CaO	MgO	MnO	P	Na_2O	K_2O
V-101	13.3—14.0	42.85	0.09	0.20	0.20	0.06	55.50	0.42	0.01	tr.	0.15	tr.
V-102	11.7—12.0	42.58	0.31	0.33	0.18	0.04	55.80	0.42	0.01	tr.	0.15	tr.
		Ignition loss	SiO_2	Al_2O_3	Fe_2O_3	TiO_2	CaO	MgO	P_2O_5	SO_3	Na_2O	K_2O
V-105	6.0—7.0	43.38	1.23	0.48	0.21	0.09	53.21	0.67				
V-106	5.0—6.0	43.60	0.46	0.32	0.12	0.04	53.89	0.80				
	11.0—12.0	43.45	0.55	0.40	0.25	0.04	53.50	0.96				
V-109	7.0—8.0	43.64	0.29	0.28	0.13	0.03	54.34	0.58				
	9.0—10.0	43.56	0.26	0.20	0.11	0.07	54.61	0.58	0.03	0.05	0.17	0.03

Analysed by B. Měřilová et al. in the Laboratories of the Geological Survey, Prague.

Locality	Limestone type	Insol. res.	SiO_2	CaO	MgO	Fe_2O_3	Al_2O_3	S	CO_2	$CaCO_3$	$MgCO_3$
Zadní kobyla	white bioclastic	0.13		55.41	0.21	0.07	0.04		43.74	98.92	0.44
Zadní kobyla	white bioclastic		0.13	55.25	0.51	0.19	0.05	0.02	43.92	98.60	1.08
Zadní kobyla	grey, clotty with sponge spicules		0.66	54.47	0.69	0.34	0.19	0.04	43.52	97.22	1.46

Analysed by J. Švasta et al. in the Laboratories of the Geological Survey, Prague.

size, some potassium feldspars, some heavy minerals (zircon and tourmaline), also volcanic glass and siliceous sponge spicules.

Chemical analyses of the Acanthopyge Limestones, tabulated in table 2, show that these limestones are rich in calcium carbonate and poor in impurities. Silica amount is generally deep below 1 %, the amount of iron is negligible (as compared to the Suchomasty Limestone). The amount of clay admixture, characterized by alumina content, is also small.

Environmental reconstruction

There are two main limestone types in this limestone unit but both can deposit in the same facies belt. It could be suggested that the depositional environment was shallow up to extremely shallow and that the sedimentation occurred on the carbonate platform. Bioclastic limestones deposited closer to its margin while "bahamites" in shallow depression of its central part, near the water level. Prior to deposition of the Acanthopyge Limestones karstification of the surface of the underlying Suchomasty Limestones occurred, and karst fissures were later filled with the material of the Acanthopyge Limestones and have now an appearance of clastic veins.

Brachiopod assemblages in the Koněprusy area

(V. Havlíček)

All the brachiopods collected from the bioclastic limestones in the Koněprusy area were assigned by Barrande (1847, 1848, 1879) to his substage Ff_1 and supposed to be of nearly the same age. Even later on, after subdividing the Koněprusy carbonate complex into several lithostratigraphic units, it was not easy to separate the Pragian suit of brachiopods from that of the Dalejan-Eifelian age; an especially intricate problem arose when examining the old collections containing free shells without any piece of adhering rock that could help us to recognize the lithostratigraphic unit that had yielded the specimens under examination. During past three decades, the present author gathered an enormous material of shelly fauna that included most (but not all!) of the species described and illustrated by Barrande (l.c.) from the Koněprusy area. This new collection allowed us to distinguish the brachiopod associations of various ages.

In spite of the fact that the Suchomasty and Koněprusy Limestones are of the Lower Devonian age, the generic representation is quite different

Table 3

Survey of articulate brachiopods in the Koněprusy area

	K	S	A
Ptychopleurella	r		
Fascizetina	c		
Arcualla	c		
Costisorthis	c		
Peleicostella	r		
Biernatium	r		
Dicoelosia	r		
Muriferella	r		
Cycladigera	c		
Schizophoria	r		
Leptaena	c		
Lepidoleptaena	c		
Taleoleptaena	r		
Cymostrophia	c		
Papillostrophia	r		
Tubulistrophia	c		
Gladiostrophia	c		
Pholidostrophia	c		
Crinistrophia	r		
Gorgostrophia	c		
Tastaria	r		
Rhytistrophia	c		
Velostrophia	r		
Bojodouvillina	c		
Planodouvillina	r		
Quasistrophonella	c		
Iridistrophia	c		
Aesopomum	c		
Boicinetes	r		
Parachonetes	c		
Caplinoplia	c		
Squamatina	c		
Sieberella	c		
Gashaomiaoia	r		
Procerulina	c		
Stenorhynchia	c		
Zlichorhynchus	r		
Praegnantenia	r		
Phoenicitoechia	r		
Eucharitina	c		
Uncinulus	c		
Nasonirhynchia	r		
Aikarhyncha	r		
Kotysex	r		
Rackirhynchia	r		
Eoglossinotoechia	c		
Glossinotoechia	c		
Latonotoechia	c		
Sicorhyncha	c		
Cherubicornea	c		
Onugorhynchia	c		
Voskopitoechia	c		
Dictynonella	r		
Rugosatrypa	c		
Kyrtatrypa	c		

	K	S	A
Lixatrypa	r		
Oglu	c		
Araneatrypa	r		
Atrypunculus	r		
Lissatrypa	r		
Rhynchospirina	c		
Meristella	c		
Nucleospira	c		
Havlicekia	c		
Plicocyrtina	r		
Howellella	c		
Hysterolites	c		
Xerospirifer	c		
Araspirifer	r		
Najadospirifer	c		
Cryptonella	c		
Paulinella	r		
Dalejina	r	r	
Protoleptostrophia	r	r	
Myriospirifer	c	r	
Cyrtina	c	c	
Quadrithyris	c	r	
Areostrophia	c	r	
Leptochonetes	c	r	
Gypidulina	c	r	
Iberirhynchia	r	r	
Taimyrrhynx	c	r	
Tetratomia	r	r	
Hergetatrypa	r	c	
Athyris	c	c	
Leptaenopyxis	c	r	
Astutorhyncha	r	c	
Merista	c	c	r
Clorinda	c	c	r
Carinatina	c	r	r
Plectospira	c	c	r
Quasimartinia	r	r	r
Leptathyris	c	c	c
Cortezorthis		r	
Holynetes		r	
Mamutinetes		r	
Markitoechia		c	
Monadotoechia		r	
Corvinopugnax		c	
Isopoma		r	
Septalaria		c	
Plicogypa		c	
Pseudosieberella		c	
Lysigypa		r	
Fossatrypa		c	
Alaskospira		r	
Metaplasia		r	
Pinguispirifer		c	
Undispirifer		r	
Quadrithyrina		c	

Table 3 (*continued*)

	K	S	A
Kaplicona		r	
Quasidavidsonia		c	c
Amissopecten		c	c
Trigonatrypa		c	c
Karbous		c	c
Rhynchatrypa		c	c
Cerberatrypa		r	c
Radimatrypa		r	r
Ambocoelia		r	r

	K	S	A
Amoenospirifer		c	r
Bojothyris		r	c
Koreticularia		c	c
Gonaulodermis		c	c
Rochtex		r	r
Obesaria			c
Kaplex			r
Krancia			r

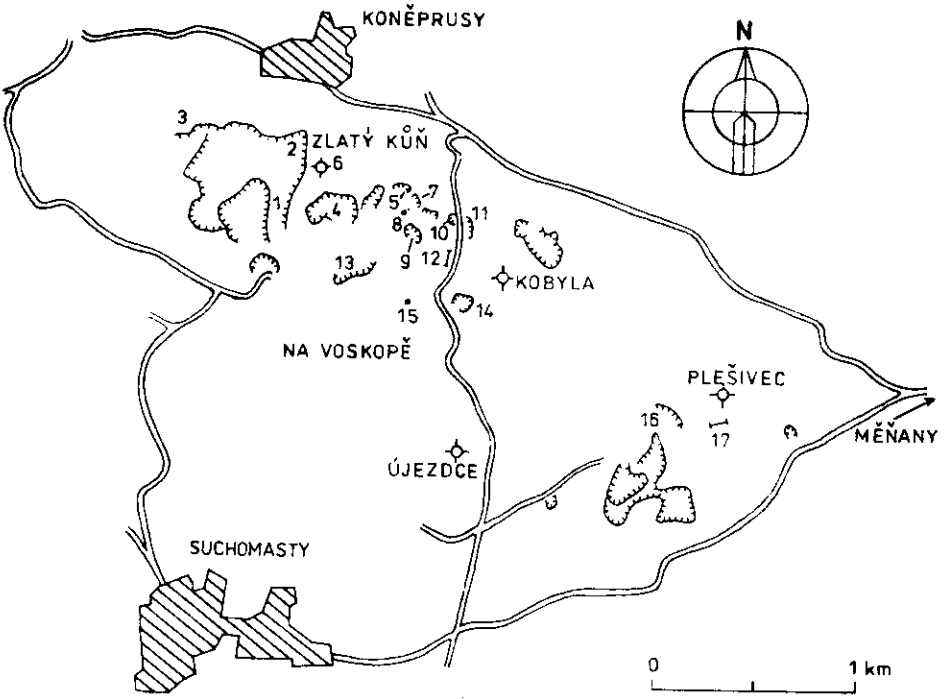
K — perireefal assemblage in the Koněprusy Limestone; S — *Karbous-Orbitoproetus* Community in the Suchomasty Limestone; A — *Karbous-Acanthopyge* Community in the Acanthopyge Limestone; c — common; r — rare

in the two units as shown in table 3. The brachiopod genera are either of Pragian or Dalejan age; only a lesser part of them occurs in both the units. The differences in brachiopod associations are best explained on environmental terms which played a more important role than the moderately different ages of the relevant lithostratigraphic units.

The Koněprusy Limestone (Pragian)

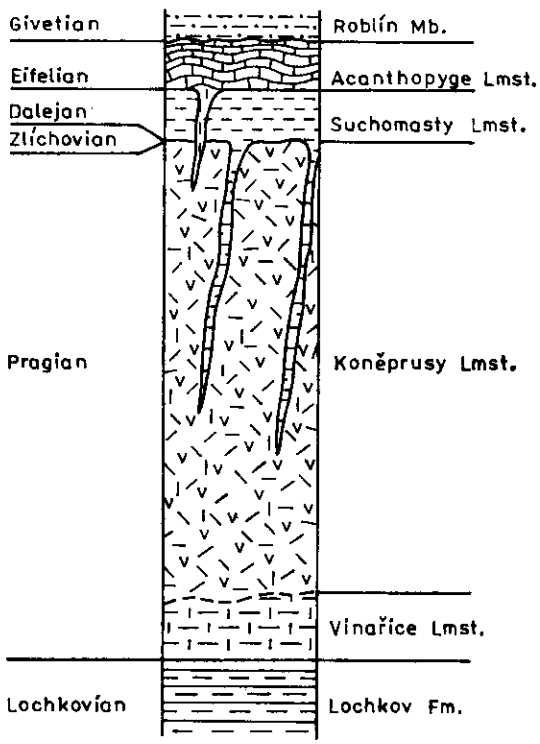
The Pragian reef complex, mostly consisting of massive, white to light-grey biolithic and bioclastic Koněprusy Limestone, gradually developed from the underlying shallow-water, bioclastic Vinařice Limestone (also of Pragian age) which is pink in colour and bears nearly the same shelly fauna as the former unit. The Koněprusy Limestone developed on a submarine elevation that may have functioned periodically as a slightly rising zone as it is evident from the break in sedimentation and erosion in the Zlíchovian time, and from the appearance of numerous vertical fissures in several generations, filled up with younger sediments (e.g. with the Suchomasty and Acanthopyge Limestones). These neptunian (sedimentary) dykes were several centimetres to several metres broad, over 100 m deep, and trending predominantly E—W (Chlupáč 1955, 1957, 1983, 1987).

In the Pragian reef complex, Chlupáč (1955, 1983, 1987) discovered the wave-resisting reef core built up predominantly of calcareous algae, stromatoporoids, and corals; remarkable are the wave-resisting crinoids with massive crowns, robust stems, and richly branched holdfast root-systems (*Pernerocrinus* and allied genera; Prokop 1987). Some benthic organisms, including *Pernerocrinus,* have been found in their



1. Review of localities in the Koněprusy area; all localities described in a greater detail by I. Chlupáč (1955, 1957)
1 — Zlatý kůň, Císařský quarry, eastern wall; sequence of the Koněprusy Limestone (in southern part richly fossiliferous); several neptunian dikes filled by the Suchomasty and Acanthopyge Limestones; below the upper edge of the wall, the Koněprusy Limestone is conformably overlain by the Suchomasty Limestone with ripple marks in its lowermost layer. *2* — Zlatý kůň, Císařský quarry, northern part near the fault ("Mramorová stěna"); sequence of the uppermost Koněprusy Limestone and richly fossiliferous Suchomasty and Acanthopyge Limestones; neptunian dikes up to 8 m thick, filled by the Suchomasty Limestone (*Karbous-Orbitoproetus* Community). *3* — Zlatý kůň, Císařský quarry, upper edge of the northern wall ("Nad tunelem"); Suchomasty Limestone confined to a neptunian dike up to 12 m thick (mostly *Karbous-Orbitoproetus* Community). *4* — Zlatý kůň, Houba quarry; sequence of the Koněprusy Limestone, in southern part of the quarry richly fossiliferous (perireefal communities); in upper part of the northern wall conformably (but sharply) overlain by the Suchomasty Limestone. *5* — Zlatý kůň, Herget quarry; sequence of the Suchomasty Limestone; type locality of the *Karbous-Orbitoproetus* Community. *6* — Zlatý kůň, top of the hill; Acanthopyge Limestone with numerous *Amplexus florescens*. *7* — Zlatý kůň, eastern part; locality "Malé lůmky", Acanthopyge Limestone. *8* — Zlatý kůň, between the Herget and Husák quarries (locality "U transformátoru"); upper part of the Suchomasty Limestone. *9* — Between Zlatý kůň and Kobyla, Husák quarry; Suchomasty Limestone resting on the massive Koněprusy Limestone with stromatolites. *10* — Between Zlatý kůň and Kobyla, small quarry at the western side of the road; Acanthopyge Limestone with abundant trilobites (e.g. *Phacops (Chotecops) hoseri*), *Amplexus florescens* and smooth brachiopods. *11* — Between Zlatý kůň and Kobyla, small quarry at the eastern side of the road, including adjacent fields with many loose fossiliferous boulders; Acanthopyge Limestone, type locality of the *Karbous-Acanthopyge* Community. *12* — Between Kobyla and "Na Voskopě" hill, west of the road; Suchomasty Limestone, transition between the *Karbous-Orbitoproetus* and *Orbitoproetus-Scabriscutellum* Communities. *13* — "Na Voskopě" hill, new quarry; Koněprusy Limestone (perireefal communi-

original growth positions. The trilobites (mostly scutelluids) and other benthic faunas occur in small lens-like accumulations that represent fillings of primary depressions and cavities in the wave-resisting buildup and its proximity (C h l u p á č 1955, 1983). Of brachiopods, the biplanar shells of *Tubulistrophia* often form coquinas in these habitats (Císařský quarry). Other shells in this part of the reef complex are often abraded due to turbulent water (*Rhynchospirina, Aesopomum, Gypidulina*).



2. Lower and Middle Devonian on Zlatý kůň, Koněprusy area

ties). *14* — Kobyla, Červený quarry; Suchomasty Limestone yielding a complete sequence of conodont (*Polygnathus laticostatus - P. serotinus - P. costatus patulus P. c. partitus*) and tentaculite zones (*Nowakia elegans - N. cancellata - N. richteri - N. holynensis*); *Orbitoproetus-Scabriscutellum Community*; bottom of the quarry formed by the Koněprusy Limestone, *15* — Between Kobyla and "Na Voskopě" hill; small quarries; neptunian dikes filled by the Suchomasty Limestone; abundant trilobites, poor brachiopod association (*Orbitoproetus-Scabriscutellum* Community). *16* — Plešivec, exposures and new quarry on the western slope; Koněprusy Limestone gradually developing from the underlying Vinařice Limestone; perireefal communities. *17* — Plešivec, southern slope; neptunian dikes filled by the Suchomasty Limestone, penetrating deep into the Koněprusy Limestone

The bulk of shelly fauna occurs beyond the reef core and is confined to massive, biodetrital limestones, surrounding and occasionally penetrating into the reef body. According to Chlupáč (1955, 1987), the sediment is formed mostly of unsorted crinoidal detritus, in places with pebbles and boulders of limestones coming from the reef core. The trilobites, which are a subordinate component of the Koněprusy Limestone, were assigned by Chlupáč (1983) to his reef scutelluid-proetid assemblage in about Benthic Assemblage 3 life position in Boucot's (1975) classification. The most diversified brachiopod assemblages occur in the lower-middle part of the Koněprusy Limestone (quarries Císařský and Houba, hills Na Voskopě and Plešivec) and contain more than 80 genera. The brachiopods can be classified into several ecological types; the cemented shells are not common (large craniids, *Taleoleptaena*). Peculiar are the irregular shells lacking attachment scars on their beaks; for this reason, they are believed to have lived firmly adpressed (but not cemented) to the substratum. During growth of the animal, their thick-walled pedicle valves followed precisely all the unevenesses on the sea floor, including various obstacles such as crinoidal columnals, fragments of corals and other organisms (Havlíček 1967). Some of these brachiopods have a well-developed pedicle (e.g. *Leptaena goldfussiana, "Leptaena" praepostera*), some lost the pedicle in adult growth stages to have reposed semiburied, but unattached, in the sediment (*Aesopomum*, some shells of *Areostrophia*). The irregular and asymmetrical shells were probably confined to rough-water environment.

The majority of shelly fauna should be assigned to the ecological type of pedunculate brachiopods (*Dalmanellacea, Enteletacea, Rhynchonellacea, Athyridacea, Retziacea, Cyrtiacea* a. o.). Beside the pedicle, some forms developed additional devices for a better stabilization on the sea floor such as large interareas (e.g. *Cyrtina, Plicocyrtina, Havlicekia*), wide hinge margins (e.g. *Hysterolites, Xerospirifer, Fascizetina*), or strikingly transversal shells with long, slender lateral extensions (*Thliborhynchia amalthea*). Pedunculate, nearly globose rhynchonellids should be assigned to the ecological subtype of reclining brachiopods (e.g. *Kransia, Uncinulus, Taymirrhynx*).

Frequent are free-lying stropheodontids and orthotetaceids with rather large, plano-convex to weakly concavo-convex (rarely resupinate) shells with low body cavities; some shells are thin-walled, very low and fragile, thus indicating a quiet-water environment in sheltered habitats as are the local depressions protected against wave and current activity (e.g. *Rhytistrophia sowerbyi, Tastaria lenis*).

Deeply concavo-convex shells have been attributed to the quasi-infaunal ecological type. According to Rudwick (1970), the quasi-in-

faunal elements were stabilized against overturning in that the calcareous detritus settled onto their upper, concave brachial valve, whereas the valve edges projected above the sea bottom (e.g. *Cymostrophia stephani, C. golem, Gorgostrophia gorgo, Gladiostrophia verneuili*). Moreover, some quasi-infaunal elements were also attached to the substratum by means of the pedicle (*Lepidoleptaena*) or minute cardinal spines directed postero-laterally (*Parachonetes, Boicinetes*).

A different type of free-lying brachiopods are the atrypids whose pedicle atrophied during life of the animal, whereas large marginal spines (*Oglu semiorbis*) or horizontally disposed trails developed (*Kyrtatrypa balda*). Some trail-bearing atrypids retained their pedicle till late adult stages (*Carinatina comata, Rugosatrypa verneuilliana*).

In perireefal assemblages, the brachiopods are usually preserved as articulated specimens not damaged by transport, and retaining all details of surficial characters including spines and trails. Disarticulated specimens are rather common only on the "Na Voskopě" hill. The brachiopods are often accompanied by bryozans (usually complete, neither crushed nor deformed zoaria), less commonly by trilobites, gastropods, and other organisms (list of fossils: Chlupáč 1955, 1987). Frequent (often dominant) component of the perireefal benthic assemblages are the large, mostly disarticulated crinoids *Eucalyptocrinites, Beyrichocrinus, Icthyocrinus, Hexacrinites, Perunocrinus, Spyridiocrinus*, and the polypeltids (Prokop 1987), associated with coprophagous platyceratids (*Praenatica, Orthonychia*). Common are also rostroconchids (*Conocardium*) and algae (*Parachaetetes* a. o.).

The Pragian benthic faunas clearly differ from those of the Suchomasty and Acanthopyge Limestones in being more diversified and involving mostly costate and costellate brachiopods, whereas the smooth shells prevail in the Dalejan—Eifelian sequences in the Koněprusy area. The Pragian perireefal benthic assemblages are not uniform over the whole Koněprusy area as they occupy various habitats ranging from the quiet to turbulent-water environments. On the whole, most of the brachiopod assemblages may be assigned to subtidal, well aerated Benthic Assemblage 3 life zone in the terminology of Boucot (1975). Chlupáč (1983) supposed the same life position for his scutelluid-proetid trilobite assemblages occupying nearly the same habitats.

The Suchomasty Limestone (Dalejan)

After the marine regression from the Koněprusy area in the Zlíchovian, the marine sedimentation reappeared in the Dalejan. This changeover in the sedimentary-tectonic regime was accompanied by an erosion of

the underlying Koněprusy Limestone and by appearance of numerous neptunian (sedimentary) dikes. The biomicrites and biosparites of Dalejan age are mostly red, pink, less commonly grey in colour; locally, a coarse crinoidal detritus with abundant shelly fauna predominates in the Suchomasty Limestone (e.g. Herget quarry). Almost everywhere the trilobites are richly diversified, whereas other sessile and vagile elements are less frequent (gastropods, cystoids, rugose and auloporid corals, cephalopods). The mostly disarticulated crinoids, unlike those of the Koněprusy Limestone, are represented by genera with small, thick-walled crowns (*Pisocrinus, Parapisocrinus, Tiaracrinus, Heracrinus*; Prokop 1987). A list of fossils collected from various localities in the Suchomasty Limestone was compiled by Chlupáč (1957, 1983).

Due to various environments in the Koněprusy area, the benthic fauna may be classified into two communities, namely the *Karbous-Orbitoproetus* Community with numerous brachiopods, and the *Orbitoproetus-Scabriscutellum* Community with strongly reduced shelly fauna.

Karbous-Orbitoproetus Community

Type locality: Koněprusy, Herget quarry (locality 5), sequence of the Suchomasty Limestone.

The most diversified sessile and vagile benthic fauna has been found in pink, massive, bioclastic (crinoidal) limestones in the Herget quarry where almost all the brachiopods are preserved as articulated specimens accompanied by numerous proetids (*Orbitoproetus orbitatus, Myoproetus myops, Eremiproetus dufresnoyi, Tropidocoryphe latens*) and much less frequent other trilobites (e.g. *Scabriscutellum oblongum*).

The brachiopod assemblage found in the Herget quarry is more uniform than that of the underlying Koněprusy Limestone, because it mostly contains the smooth and weakly plicate pedunculate forms. By contrast, the Koněprusy Limestone has yielded diverse ecological types of brachiopods including the irregular orthotetaceids, free-lying strophеodontids and many quasi-infaunal elements which all are absent in the Suchomasty Limestone. Moreover, among the Pragian brachiopods are frequent the costate and costellate shells which are rare in the Suchomasty Limestone. In the Herget quarry, the strongly ribbed forms such as *Amoenospirifer oenone, Plycogypa lukesi* and *Pseudosieberella labrusca* are subordinate components of the community. In the *Karbous-Orbitoproetus* Community, the smooth brachiopods prevail (*Merista, Clorinda, Lysigypa, Pinguispirifer, Trigonatypa, Karbous, Eoreticularia, Cingulodermis* a. o.). Interesting are the originally costate and plicate stocks

which became smooth or weakly plicate in the Suchomasty Limestone. For example, *Quasidavidsonia tenuissima* is the earliest member of the carinatinid stock which has lost completely its radial pattern.

Another example of brachiopods tending to lose their radial ornament is *Plectospira*; in the Herget quarry, it comprises a complete sequence of forms ranging from the coarsely costate shells (*P. dione, P. grochonia*) to very weakly plicate shells; in extreme cases, some specimens retained a weak plication only in umbonal regions, whereas the rest of their shells became almost smooth. Owing to its strongly reduced plication, *P. leniplicata* is an unusual brachiopod among the *Retziacea*.

The transition from the costate to weakly plicate (rarely almost smooth) forms has also been found in *Amoenospirifer*. *A. oenone* is distinguished by strong, angular ribs, whereas both *A. amoenoides* and *A. foedus* bear rounded ribs often tending to disappear on the flanks.

Owing to prevalence of smooth spire-bearing brachiopods not affected by wave and current activity, we suppose a quiet, very shallow environment for the *Karbous-Orbitoproetus* Community in about Benthic Assemblage 2 life zone.

Survey of brachiopods of the *Karbous-Orbitoproetus* Community:

Cortezorthis sp. A
Leptaenopyxis irena (H.) B
Protoleptostrophia sp. A
Areostrophia ares sp. n. B
Leptochonetes papyrus H. & R. B
Mamutinetes perlatipleura sp. n. A
Plicogypa lukesi sp. n. C
Pseudosieberella labrusca sp. n. C
Lysigypa morosoides sp. n. C
Gypidulina ariadna sp. n. B
Gypidula sp. A
Clorinda exarmata sp. n. C
Clorinda robustisella sp. n. C
Clorinda baccalaria sp. n. C
Clorinda acrimona sp. n. C
Corvinopugnax corvinus (Barr.) C
Astutorhyncha proserpina (Barr.) C
Markitoechia omissa H. A (D)
Markitoechia clavula sp. n. B
Septalaria palumbina (Barr.) C
Amissopecten velox (Barr.) B
Amissopecten obsolescens (Barr.) B
Tetratomia coalescens sp. n. B
Trigonatrypa protobaucis sp. n. B
Radimatrypa zelaria sp. n. B
Karbous aperinus H. C
Karbous truncatus H. C
Rhynchatrypa thetis (Barr.) C
Cerberatrypa dissidens (Barr.) B
Fossatrypa granulifera (Barr.) C
Carinatina arimaspus (Eichw.) B
Hergetatrypa minuta (Siehl) C
Plectospira dione sp. n. C
Plectospira grochonia sp. n. B
Plectospira leniplicata sp. n. C
Leptathyris deino sp. n. C
Merista passer (Barr.) C
Merista repellens sp. n. C
Rochtex lissopleura sp. n. B

Myriospirifer insidiosus (Barr.)	A	*Undispirifer transiens* (Barr.)	(A) D
Pinguispirifer fessus sp. n.	C	*Bojothyris nikiforovae* H.	B
Amoenospirifer oenone sp. n.	C	*Alaskospira accedens* (Barr.)	B
Amoenospirifer foedus sp. n.	C	*Quasimartinia lubrica* sp. n.	B
Quadrithyris sobrina sp. n.	A	*Cingulodermis columbina* (H.)	C
Quadrithyris orba (Barr.)	C	*Metaplasia nekvasilovae* sp. n.	B
Quadrithyrina ivanovae H.	C	*Ambocoelia mesodevonica* H.	A
Eoreticularia indifferens (Barr.)	B	*Cyrtina platypleura* sp. n.	C
Eoreticularia fraterna (Barr.)	C	*Cyrtina* aff. *morana* H.	B

A — very rare (1 or 2 specimens found up to now); B — rare (less than 10 specimens); C — frequent; D — mostly old collections.

On the periphery of the *Karbous-Orbitoproetus* Community, the composition of shelly fauna moderately differs from that of the Herget quarry. On the northern wall of the Císařský quarry (locality 3), it acquires several elements absent from the type locality — e.g. *Isopoma alecto* (Barr.), *Kaplicona fragilis* (Barr.), *Quasidavidsonia tenuissima* (Barr.), *Athyris odolens* sp. n., and *Pinguispirifer infirmus* (Barr.). Moreover, many specimens are disarticulated and often accompanied by crushed trilobites, thus indicating a rough-water environment.

A similar community has been discovered south of the Herget quarry (locality 8); besides the shelly fauna recognized in the Herget quarry, it has yielded many shells of *Athyris odolens* sp. n. and richly diversified gastropods, hyolithids, and goniatites (Chlupáč - Vaněk 1957).

Orbitoproetus-Scabriscutellum Community

Type locality: Koněprusy, Císařský quarry (locality 1), sequence of the Suchomasty Limestone.

The *Orbitoproetus-Scabriscutellum* Community, including a complete list of trilobite species, was described by Chlupáč (1983) under the name *Orbitoproetus-Scabriscutellum* Assemblage. It is confined to red or grey biosparites and biomicrites with variable amount of crinoidal detritus, locally passing into nodular muddy limestone. Richly diversified trilobites are represented by proetids and phacopids, while scutelluids, harpids, cheirurids, lichids, otarionids, and odontopleurids are a subordinate component of the community. Rather frequent are crinoids,

cystoids, gastropods, small bivalves, rugose and auloporid corals, all accompanied by planktic and nectic forms (conodonts, nautiloids, goniatites, tentaculites) (Chlupáč 1955, 1957, 1983). According to Chlupáč (1983), the fragmentary state of trilobites, local accumulations of fossils, and abrupt changes in the grain-size indicate deposition under high-energy, shallow water environment of Benthic Asemblage 3 in Boucot's classification.

By contrast to the *Karbous-Orbitoproetus* Community, the brachiopods are not common in the *Orbitoproetus-Scabriscutellum* Community; in quarries Císařský (eastern wall), Houba and Červený, the Suchomasty Limestone has yielded mainly small brachiopods which are absent from the *Karbous-Orbitoproetus* Community, e.g. *Dalejina* sp., *Dalejodiscus subcomitans* (Havl.), and *Holynetes* cf. *holynensis* H. & R., accompanied by *Bojothyris nikiforovae* Havl. and *Leptaenopyxis irena* (Havl.). Several brachiopods collected in the past century in the Koněprusy area should also be assigned to the *Orbitoproetus-Scabriscutellum* Community [e.g. *Monadotoechia monas* (Barr.), *Quadrithyris orba* Havl., *Eoreticularia indifferens* (Barr.), *Amoenospirifer amoenoides* Havl.].

The Acanthopyge Limestone (Eifelian)

Chlupáč (1959, 1983, 1987) assigned to the Acanthopyge Limestone a sequence of light grey biosparites of various grain sizes alternating with layers of coarse bioclastic limestone bearing transported and reworked tabulates and stromatoporoids; biomicrites with fragile clusters of rugose corals (*Amplexus*) show no trace of redeposition. As the Acanthopyge Limestone deposited on a submarine elevation, its total thickness is very small (15—20 m), although it corresponds in age to the substantial part of the Eifelian. The very slow rate of subsidence is reflected in a shallow-water character of sediments not uncommonly showing a higher salinity (Kukal 1964; bahamites).

The carbonate sedimentation continued uninterrupted from the Dalejan to the Eifelian; for this reason, the benthic assemblages of the uppermost Lower Devonian and Eifelian are closely related to each other. The generation of neptunian (sedimentary) dikes of lower Eifelian age is less significant than that of the Dalejan age; an oblique dike penetrating deep into the Suchomasty Limestone and filled with the Acanthopyge Limestone containing many fossils (e.g. *Acanthopyge haueri, Amissopecten velox*) was discovered by Chlupáč (1959, 1983) in the Herget quarry. The vagile and sessile faunas are high-diversified in the Acanthopyge Limestone; list of fossils was compiled by Chlupáč (1959, 1983).

Karbous-Acanthopyge Community

Type locality: Koněprusy, small quarry between Zlatý kůň and Kobyla (locality 11), sequence of the Acanthopyge Limestone.

This community was proposed by Chlupáč (1983) under the name *Acanthopyge-Phaetonellus* Assemblage; the most abundant trilobites are proetids of the genera *Phaetonellus, Orbitoproetus, Tropidocoryphe, Eremiproetus, Proetopeltis, Koneprusites,* and *Ignoproetus,* usually accompanied by *Acanthopyge haueri, Phacops (Chotecops) hoseri, Leonaspis pigra, Aulacopleura bohemica, Cheirurus affinis affinis,* and *Thysanopeltis speciosa.* The brachiopods are abundant, but less diversified than in the underlying Suchomasty Limestone. Interesting is the difference between the trilobite and brachiopod associations: the Eifelian-age trilobites are clearly distinct from those of the Dalejan age, whereas almost all brachiopod genera and many brachiopod species cross the Lower/Middle Devonian boundary to survive till the Eifelian. Over two thirds of the Eifelian brachiopod species are common to the Suchomasty and Acanthopyge Limestones.

The smooth, spire-bearing brachiopods are dominant elements among the sessile benthic faunas in the Acanthopyge Limestone. They are never accompanied by strongly costate forms; few species with weak radial ribbing do occur there (*Amissopecten velox, A. obsolescens*).

Survey of brachiopods of the *Karbous-Acanthopyge* Community:

Clorinda strix (Barr.)	C	*Quasidavidsonia mediocarinata* (H.)	C
Errhynx sp.	D	*Plectospira varioplicata* Siehl	A
Kransia aff. *parallelepipeda* (Br.)	A	*Leptathyris deino* sp. n.	C
Amissopecten velox (Barr.)	C	*Merista repellens* sp. n.	B
Amissopecten obsolescens (Barr.)	C	*Rochtex lissopleura* sp. n.	B
Trigonatrypa baucis (Barr.)	C	*Amoenospirifer oenone* sp. n.	A
Trigonatrypa securis (Barr.)	B	*Amoenospirifer amoenoides* H.	A
Karbous hassiacus (Siehl)	C	*Eoreticularia fraterna* (Barr.)	C
Karbous truncatus H.	B	*Bojothyris nikiforovae* H.	C
Rhynchatrypa thetis (Barr.)	C	*Quasimartinia lubrica* sp. n.	A
Cerberatrypa dissidens (Barr.)	D	*Obesaria obesa* (Barr.)	C
Cerberatrypa cerberus sp. n.	C	*Cingulodermis columbina* (H.)	C
Radimatrypa zelaria sp. n.	B	*Ambocoelia mesodevonica* H.	B
Carinatina sp.	A	*Kaplex bohemicus* (Barr.)	B

A — very rare (1 or 2 specimens in the collection); B — rare (less than 10 specimens); C — frequent; D — old collections.

Due to prevalence of smooth, pedunculate, spire-bearing brachiopods, the *Karbous-Acanthopyge* Community closely recalls the Silurian *Dubaria* Community which is also distinguished by predominance of smooth, spire-bearing, never disarticulated shells overcrowding the banks of bioclastic limestone; for this reason, we may suppose a similar environment for both. The *Karbous-Acanthopyge* Community is assigned here to the shallowest, well aerated, subtidal Benthic Assemblage 2 (localy 3); the layers yielding abundant brachiopods were deposited under a quiet-water regime, whereas several layers of bioclastic, often brecciated limestone with reworked corals and stromatoporoids originated in a rough-water environment. After examining the trilobites, Chlupáč (1983) came to the same conclusion and suggested B.A. 2—3 life zone for his *Acanthopyge-Phaetonellus* Assemblage.

The very shallow, warm-water environment with a higher salinity may also be documented by the presence of bahamites in some parts of the Eifelian sequence (Kukal 1964). Several growths of fragile corals (*Amplexus florescens*), that were never damaged during transport, indicate the Eifelian biostromes in the Koněprusy area (Chlupáč 1983).

Karbous-Orbitoproetus and Karbous-Acanthopyge Communities in the Rhenish-Bohemian Region

The *Karbous-Orbitoproetus* and *Karbous-Acanthopyge* Communities occur only in the Koněprusy area in the Prague Basin (Barrandian area). A few elements of these communities (e.g. brachiopods, trilobites) were discovered at Horní Benešov (Nízký Jeseník Mts., Moravia) in calcareous shales and limestone nodules, in association with several brachiopods indicating a somewhat deeper environment (Havlíček - Pek 1986).

In the Rhenish-Bohemian Region, the most similar benthic fauna occurs near Greifenstein (Rheinisches Schiefergebirge, F.R.G.) in the Greifenstein Limestone (Eifelian) which strongly recalls the Suchomasty Limestone not only by its lithological character and colour but also by the richly diversified vagile and sessile benthos with brachiopods consisting mostly of smooth and weakly plicate forms. According to Siehl (1962), the following species are common to the Greifenstein Limestone and the Suchomasty-Acanthopyge limestone complex: *Kaplicona fragilis, Prodavidsona tenuissima, Monadotoechia monas, Septalaria palumbina, Hergetatrypa minuta, Fossatrypa granulifera, Rhynchatrypa thetis, Merista passer, Plectospira varioplicata, Pinguispirifer infirmus, Amoenospirifer*

thetidis, Quadrithyris orba, Quadrithyrina ivanovae, Eoreticularia fraterna, E. aff. *indifferens, Ambocoelia mesodevonica,* and *Cingulodermis columbina.* Further, *Leptathyris gryphis* is very close to the Bohemian *L. deino.* The genus *Trigonatrypa* most probably occurs in both the areas. Of trilobites, *Orbitoproetus orbitatus* and *Leonaspis pigra* were found both at Greifenstein and in the Koněprusy area. Moreover, many trilobites are represented in the Greifenstein Limestone by forms closely related to those of the Suchomasty-Acanthopyge limestone complex, namely those of the genera *Acanthopyge, Thysanopeltis, Eremiproetus, Phaetonellus,* and *Tropidocoryphe.* Judging from the close faunistic relations, we may suppose nearly the same, very shallow-water environment both at Greifenstein and in the Koněprusy area. According to Siehl (1962), the Greifenstein Limestone deposited on a submarine, flat-topped elevation built of crinoidal detritus, with prevalence of thick-shelled brachiopods. Small, smooth brachiopods and abundant trilobites prevail in the biomicrite layers. Although many species are common to the Suchomasty and Greinfenstein Limestone, the latter unit is somewhat younger and corresponds to the Pinacites jugleri Zone of Eifelian age. The coincidence in faunas is best explained on environmental terms.

Survey of articulate brachiopods

(V. Havlíček)

Dalmanellacea Schuchert, 1913

Dalmanellidae Schuchert, 1913

Prokopia Havlíček, 1953

Prokopia sp.

Occurrence: Suchomasty Limestone, locality 15 (rare).

Cortezorthis Johnson & Talent, 1967

Cortezorthis sp.

1977 *Cortezorthis* sp.; Havlíček, p. 199, pl. 56, figs. 10, 11.

Occurrence: Suchomasty Limestone, localities 5, 8.

Rhipidomellidae Schuchert, 1913

Dalejina Havlíček, 1953

Dalejina sp.

Pl. III, fig. 1

Remarks: All valves were collected from a red-brown micrite with shelly fauna and trilobites crushed into fragments 1—5 mm large, accompanied by columnals of crinoids.

Occurrence: Suchomasty Limestone, locality 4.

Plectambonitacea Jones, 1928

Sowerbyellidae Öpik, 1930

Dalejodiscus Havlíček, 1961

Dalejodiscus subcomitans (Havlíček, 1956)

1967 *Dalejodiscus subcomitans* (Havlíček, 1956); Havlíček, p. 65, pl. 8, figs. 8, 9, 11—16; text-figs. 33, 34.

Occurrence: Suchomasty Limestone, locality 15.

Strophomenacea King, 1846

Leptaenidae Hall & Clarke, 1894

Leptaenopyxis Havlíček, 1963

Leptaenopyxis irena (Havlíček, 1967)

Pl. III, figs. 2—6

1967 *Glossoleptaena? irena* sp. n.; Havlíček, p. 117, pl. 20, figs. 15—17.

Exterior (based on recently gathered material): Shell small for the genus, 16—22 mm wide at the hinge line, with a low body cavity; disc of pedicle valve trapezoidal in outline, gently convex umbonally but flat or even slightly concave anteriorly, separated by a low, transverse ridge (less commonly by a conspicuous edge) from the high trail that is directed dorsally. Trails, located at the antero-lateral sides of the disc, are highly raised in ventral direction; their tops recurve again dorsally, thus recalling the shape of shell of *L. bouei* (Barr.). Cardinal angles acute; ventral interarea low, flat, apsacline; pseudodeltidium in all specimens examined ill-preserved. Pedicle foramen sealed in adult specimens.

Disc of brachial valve flat to gently concave posteriorly but slightly convex anteriorly and laterally, separated by a deep furrow from the trail that is bent dorsally in the median sector of the valve. Antero-lateral sides of the brachial valve reflected ventrally to produce small to large (depending on age of the specimen) tongue-shaped extensions that are interpreted as antero-lateral trails directed ventrally. Dorsal interarea anacline, somewhat smaller than the ventral one; chilidial plates not examined. Protegular stage preserved as an elongate, highly raised node.

Ribs low, rounded, narrower than interspaces, numbering 10—13 per 2 mm; concentric rugae weak to obscure umbonally, but narrow, rather high anteriorly, numbering over 10 (maximum 20) in the median sector; in antero-lateral portions of the ventral disc, the rugae are more frequent than in the median sector, because 2 or 3 new ones set off from the transverse ridge bounding the disc. Concentric ornament is often irregular as some rugae are more slender than the others, or one rather strong ruga may split locally into two slender ones.

Interior: Shell pseudopunctate; papillae in a chaotic arrangement in umbonal regions of both valves, but anteriorly and laterally forming concentric rows located on tops of ridges corresponding to the concentric furrows of the outer valve surface. Ventral muscle field circular, surrounded by ridges, not extending beyond a third of the length of the disc. Diductor scars about as large as the triangular adductor scar that is located on a low platform.

Brachiophores not examined; dorsal muscle field elongate-oval, occupying about 2/3 of the length of the disc. Adductor impressions underlain by low pads of secondary shell material, separated from each other by a triangular field bearing a slender median ridge. Visceral cavity bounded anteriorly by a high diaphragm.

Remarks: By its shape of the shell, presence of strong rugae, peculiar arrangement of trails, and presence of a high diaphragm in the brachial valve, *L. irena* recalls the Lower Devonian (Pragian) species *L. bouei* (Barr.); it lacks, however, a shallow median depression that is well-developed in the brachial valve of *L. bouei.* In spite of its much smaller size, there is no reason to exclude the species *"irena"* out of *Leptaenopyxis.*

Occurrence: Suchomasty Limestone, localities 2, 3, 5, 8. Further Gornyi Altai Mts., topmost Lower Devonian (the shells figured by Gracianova, 1967, under the name *Rugoleptaena hornyi* Havl. are not distinguishable from the Bohemian *L. irena* in the size, shape, and ornamentation).

Stropheodontacea Caster, 1939

Leptostrophiidae Caster, 1939

Protoleptostrophia Caster, 1939

Pl. III, fig. 16

Remarks: Our material includes only one pedicle valve that is 17.6 mm wide; its surface is finely striated with 11—12 rounded capillae per 2 mm; intergrooves are angular. The valve was damaged and subsequently repaired during life of the animal. Anterior part of the valve bears shallow, moderately irregular dimples; we are not sure if this is a growth anomaly or a post-mortem deformatin of the valve.

Occurrence: Suchomasty Limestone, locality 5.

Orthotetacea Waagen, 1884

Schuchertellidae Williams, 1953

Areostrophia Havlíček, 1965

Areostrophia ares sp. n.

Pl. III, figs. 7, 8

Holotype: brachial valve figured on pl. III as fig. 7; VH-2545a.
Type horizon and locality: Suchomasty Limestone, locality 3.
Material: 1 shell, 4 brachial valves, 3 pedicle valves, and several incomplete specimens.

Exterior: Shell 8.5—12.5 mm wide, planoconvex to ventri-biconvex with a low body cavity. Pedicle valve gently to moderately convex in lateral profile; sides curved, anterior margin nearly straight; cardinal angles narrowly rounded; ventral interarea apsacline, nearly flat, pseudodeltidium large, convex.

Brachial valve flat or slightly convex in lateral profile, medianly with a shallow sulcus originating near the beak and reaching the front margin. Dorsal interarea and chilidial plates absent.

Costellae slender, subangular, 6—7 per 2 mm antero-medianly, separated by flat interspaces; concentric fila not observed (due to imperfect state of preservation?).

Interior: Shell impunctate; dental plates missing. Interior of brachial valve not examined.

Comparison: By its overall shape and ornamentation, *A. ares* recalls *Eoschuchertella popovi* Gracianova (Gornyi Altai, Eifelian; Gracianova 1974), but it lacks the dorsal interarea and chilidial

plates which are a significant feature of the latter species. For this reason, the new Bohemian species is retained within the genus *Areostrophia* which — unlike *Eoschuchertella* — is distinguished by the absence of both the dorsal interarea and chilidial plates.

A. ares differs from the earlier *A. distorta* (Barr.) (Koněprusy and Zlíchov Limestones) in having smaller size and finer ornamentation; further, the brachial valve of the new species is planar to slightly convex, that of *A. distorta* always convex.

Occurrence: Suchomasty Limestone, localities 3, 5.

Chonetacea Bronn, 1862

Chonetidae Bronn, 1862

Holynetes Havlíček & Racheboeuf, 1979

Holynetes cf. *holynensis* Havlíček & Racheboeuf, 1979
Pl. IV, figs. 5—8

Remarks: The specimens available are closely similar to *H. holynensis* (Choteč Limestone, Pinacites jugleri Horizon) except for being somewhat smaller and having finer ribbing. Pedicle valves collected from the Suchomasty Limestone are 4.6—5.5 mm wide and bear over 5 costellae per 1 mm. Cardinal spines not examined due to poor preservation.

Occurrence: Suchomasty Limestone, localities 3, 14 (only 1 brachial and 3 pedicle valves available).

Leptochonetes Havlíček & Racheboeuf, 1979

Leptochonetes papyrus Havlíček & Racheboeuf, 1979
Pl. IV, figs. 11—13

1979 *Leptochonetes papyrus n. sp.;* Havlíček - Racheboeuf, p. 95, pl. 8, figs. 9—11.

Occurrence: Suchomasty Limestone, localities 3, 5.

Mamutinetes g.n.

Type species: *Mamutinetes latipleura* sp. n.

Diagnosis: Shell similar to that of *Chonetes* Fischer, gently concavo-convex, with rectangular cardinal angles; hinge spines orthomorph-oblique, 3 at each side of the posterior margin. Radial pattern

characterized by broad and very low ribs moderately expanding forward, rarely bifurcating and gradually disappearing towards beaks of both valves.

Ventral muscle field obscure; ventral mid-septum short (about 1/6 of the maximum valve length); postero-lateral sides of the field bounded by short ridges containing about a right angle.

Cardinal process short, U-shaped, probably with bilobate posterior face; alveolus deep, elongate-oval; breviseptum low, extending to about 4/5 of the valve length; accessory septa even weaker, all bearing fine papillae on their tops. Anderidia not clearly individualized. Inner cristae long, occupying slightly less than half-width of the valve, with lateral portions straight, highly elevated, running parallel with the hinge line. Dorsal muscle field obscure. Coarse papillae confined to the peripheral part of the brachial valve, where they are arranged in radial rows.

Comparison: *Chonetes* Fischer, based on *Terebratula sarcinulata* Schlotheim (re-examined by Racheboeuf 1978), differs from *Mamutinetes* in having well-developed costellae and capillae over the whole surface of both valves, whereas the new genus bears broad ribs of inconspicuous relief gradually disappearing towards the beaks. For this reason, the umbonal regions of both valves are nearly smooth in *Mamutinetes*. Another distinguishing feature is the size of the mid-septum in the pedicle valve; the mid-septum occupies about 2/3 of the maximum length of the pedicle valve in *Chonetes*, that of *Mamutinetes* is only 1/6 as long as the valve. Brachial valve interior is nearly the same in both the genera except for the alveolus which is deeply excavated in the new genus but very shallow in *Chonetes*. Further, the inner cristae are short and curved in *Chonetes*, those of *Mamutinetes* are strikingly long with straight and strong lateral portions running parallel with the hinge line.

Mamutinetes latipleura sp. n.

Pl. IV, figs. 1—4

Holotype: pedicle valve figured on pl. IV as fig. 4; VH 2347.

Type horizon and locality: Choteč Limestone, Praha-Hlubočepy, locality "U mamutího jezírka".

Material: 6 pedicle valves, 2 brachial valves, and several incomplete specimens.

Exterior: Shell low, gently concavo-convex, 10—12 mm wide. Pedicle valve moderately convex in transverse and lateral profiles, about 64 % as long as maximum width, widest at hinge line; cardinal angles rectangular. Beak gently elevated; ventral interarea low, apsacline, deltidial plates not observed (due to weak preservation). Three pairs of

orthomorph-oblique spines, containing acute to almost right angles with the posterior margin. Brachial valve gently concave; dorsal interarea very low, anacline to catacline, notothyrium not examined.

Ribs very low, of inconspicuous relief, in umbonal regions obscure, forwardly increasing in size to become rather broad, in anterior part of the shell counting 5 per 2 mm, mostly simple, exceptionally bifurcating, somewhat broader than interspaces.

Interior: Medium septum low, slender, occupying about 17 % of the pedicle-valve length; ventral muscle field bordered postero-laterally by short, weak ridges; anterior and lateral margins of the field obscure. Coarse papillae not developed in the pedicle valve.

Cardinal process short, in ventral view U-shaped, posteriorly directed; its lobes ill-preserved in all specimens available. Alveolus deep, elongate; breviseptum weak, slightly increasing in size toward front margin, reaching its maximum height in its anterior part, extending forward beyond 4/5 of the valve length. Accessory septa even weaker than the breviseptum, not extending beyond 2/5 of the valve length, and containing about 25°. Anderidia indistinct. Inner cristae curved near the cardinal process but straight laterally to run parallel with the hinge line, fairly long, occupying about 45 % of the maximum width of the brachial valve. Dental sockets elongate, shallow. Fine papillae located on tops of the breviseptum and accessory septa; the coarsest papillae, arranged in radial rows, occur beyond the visceral field; muscle scars obscure in the brachial valve.

Occurrence: Type locality only.

Mamutinetes perlatipleura sp. n.

Pl. IV, fig. 9; pl. XXIII, fig. 1

1979 *"Chonetes"* sp. 1; Havlíček - Racheboeuf, p. 111, pl. 6, fig. 9.

Holotype: Pedicle valve figured on pl. IV as 9; VH 2304a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 2 pedicle valves and few incomplete specimens.

Exterior: By its size, shape, and ornamentation similar to *M. latipleura* but having a somewhat greater convexity in ventral umbonal region and clearly broader costae which count 3 per 2 mm near front margin. Interior not investigated.

Occurrence: Type locality only.

Gypidulacea Schuchert & LeVene, 1929

Gypidulidae Schuchert & LeVene, 1929

Plicogypa Ržonsnickaja, 1975

Plicogypa lukesi sp. n.

Pl. V, figs. 3—6; text-fig. 3

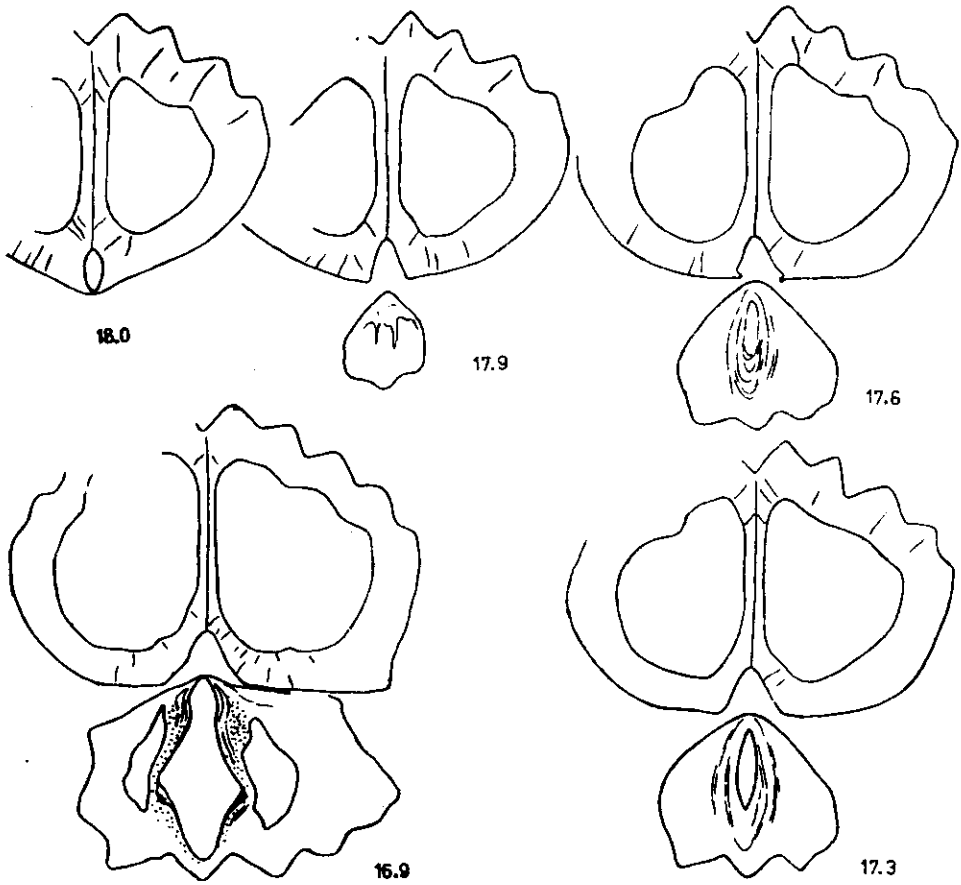
Holotype: Shell figured on pl. V as fig. 6; VH 4813d.
Type horizon and locality: Suchomasty Limestone, locality 5.
Name: After Pavel Lukeš who revised tentaculites of the Suchomasty Limestone.
Material: 24 shells and several valves.

Exterior: By its general aspect recalling a strongly costate *Sieberella,* 10.0—23.6 mm wide in specimens available, in young specimens 54—60 % as high as maximum width, in late adults 57—73 % as high as wide. Pedicle valve much higher than the brachial valve, 77—95 % as long as its maximum width, with a strong, incurved beak. Ventral fold very low to almost indistinct, flat-topped; flanks of pedicle valve steeply sloping towards lateral commissures.

Brachial valve transversely elliptical, 71—77 % as long as wide (extreme: 82.6 % in the largest specimen available), widest near the hinge line; in longitudinal (median) section more curved umbonally than anteriorly; dorsal beak hardly raised above valve surface; sulcus, appearing anterior to the beak, is shallow, well-developed, less commonly obscure; tongue always present, trapezoidal.

Ribs subangular to angular, usually simple, broader than deep angular interspaces, devoid of fine grooves on their tops; interesting is the largest shell available which on top of each costa bears a very fine ridge that disappears near the front margin to be substituted by a short (less than 1 mm) groove, a feature recalling the *Ivdelinia*-type pattern. As these incipient short grooves have been observed only in one gerontic shell, they are not regarded as a feature indicating a close relation to *Ivdelinia* Chodalevič. Sulcus bears always a median costa starting at the beak, and a pair of lateral ribs that originate as secondaries on inner sides of the sulcus-bounding costae in a short distance from the beak. In the late adult shell (pl. V, fig. 6b), the mid-rib bifurcates about at mid-length of the valve. Ventral fold of young and adult shells bears 4 ribs, all starting at the beak, whereas the gerontic shell has 6 ribs in anterior part of the fold because of bifurcation of some costae. Flanks occupied by 3—5 ribs. Growth lines present.

Interior: See text-fig. 3; shell thick-walled, inner prismatic layer covering both the inner surface of valves and the sides of the mid-sep-



3. *Plicogypa lukesi* sp. n.; transverse serial sections, ×7

tum and spondylium. Median septum extends to about a quarter of the pedicle-valve length. Vascula media faintly impressed, broadly divergent, originating at front of the median septum.

Dorsal plates lyre-shaped in cross section; septal plates converge to the valve floor but never fuse into a cruralium; their bases extend anteriorly beyond a third of the valve length, slightly diverge forward to bound laterally a very narrow field about 1.2—1.5 mm wide, 5 mm from the apex.

Comparison: *P. pseudoacutolobata* (Ržonsnickaja) (Salairka Beds, Middle Devonian, Kuzneck Basin; Ržonsnickaja 1960, 1975; Upper Emsian, southern Tian-Shan, and Kireevsk Beds, Lower Devonian, Gornyi Altai; Malygina - Sapel'nikov 1973) is closely similar to *P. lukesi*; it differs from the latter in having an elongate pe-

dicle valve, rounded ribs, and 4—5 ribs in the sulcus, whereas the pedicle valve of the new species is always wider than long, the ribs are subangular to angular, and 3 costae occupy the bottom of the sulcus in the Bohemian species.

Occurrence: Suchomasty Limestone, locality 5.

Pseudosieberella Godefroid, 1972

Pseudosieberella labrusca sp. n.

Pl. V, figs. 1, 2; text-figs. 4—6

Holotype: Shell figured on pl. V as fig. 1; VH 4816a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 35 shells.

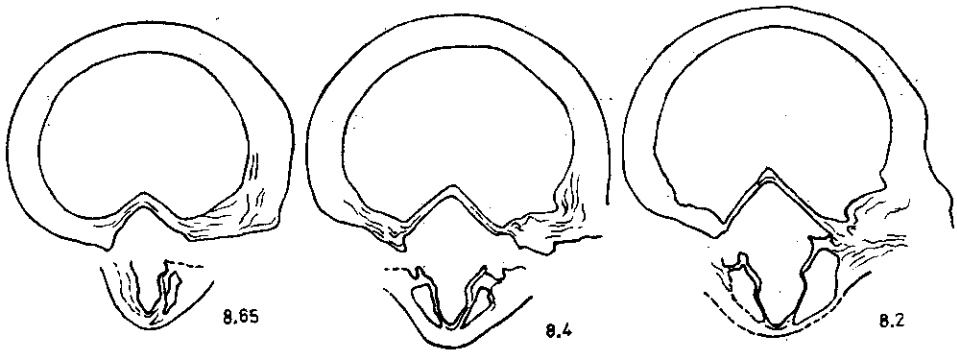
Exterior: Shell 7.6—15.2 mm wide, and 55—65 % (exceptionally 78 %) as high as maximum width, by general aspect recalling a small *Sieberella,* ventri-biconvex, with a strong ventral beak extending considerably beyond the hinge line. Pedicle valve 77—90 % as long as its maximum width (extremes: 68.3 and 92.7 %), strongly and almost evenly convex in lateral profile, with a flat-topped fold in its anterior part. Ventral palintrope low, incurved, not bounded by edges. Delthyrium almost completely filled by the beak of the opposite valve.

Brachial valve transversely elliptical, usually 72—82 % as long as wide (extremes: 68.1 and 83.4 %), with a smooth, slightly elevated beak. In longitudinal (median) section, brachial valve strongly and evenly convex; sulcus, developed in anterior part of the valve, occupies about half-width of the shell (extremes: 44 and 57 % of the maximum width).

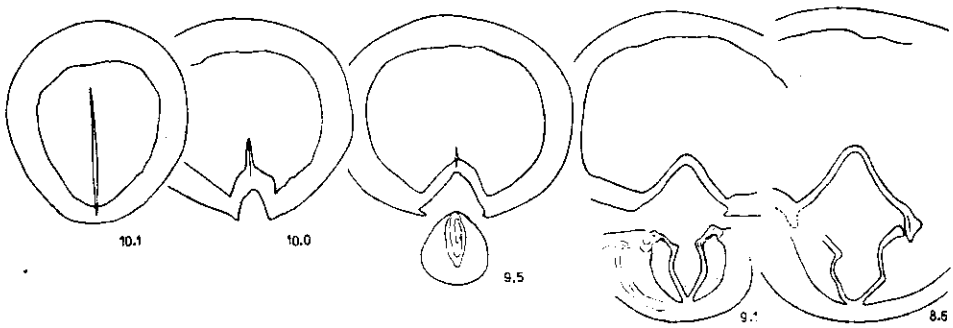
Ribs subangular, broader than angular interspaces, mostly simple, exceptionally bifurcating and never bearing grooves on their tops, thus differing from the *Ivdelinia*-type costae. Fold with 3 or 4 ribs, exceptionally bearing 2 (in one specimen) or 5 ribs (also in one specimen). Flanks occupied by 3—4 costae. Bottom of sulcus usually bears 2 ribs, less commonly 3 or 4 ribs. One sole shell has 1 rib in the sulcus.

Interior: See text-figs. 4—6.

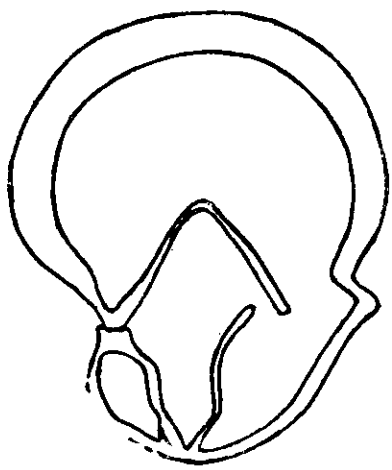
Comparison: By its general aspect, *P. labrusca* recalls *P. montana* (Spriestersbach) (Ohle Beds, lower part of the Middle Devonian, Bergisches Land; and Ahrdorf Beds, upper Couvinian, the Eifel; Godefroid 1972). The ribs in *P. montana,* however, originate much later than those of the Bohemian species, as they appear at or even anterior to mid-length of both valves; the fold of *P. montana* bears 2—3 ribs. and the sulcus is occupied by 1—2 ribs, whereas the ribs in *P. labrusca* are more numerous (3—4 on the fold, 2—3 in the sulcus).



4. *Pseudosieberella labrusca* sp. n.; transverse serial sections, ×6



5. *Pseudosieberella labrusca* sp. n.; transverse serial sections, ×5



6. *Pseudosieberella labrusca* sp. n.; transverse section, ×12

P. corrugata Godefroid (Upper Couvinian, Belgium; Godefroid 1972) differs from the Bohemian species in having much larger shell with an elongate pedicle valve; further, it bears 2—3 ribs on the fold,

and 1—2 ribs in the sulcus, whereas *P. labrusca* has usually 3—4 costae on the fold and 2—3 in the sulcus. By contrast to the Couvinian species, *P. labrusca* is always wider than long.

Occurrence: Suchomasty Limestone, localities 5, 8.

Lysigypa g. n.

Type species: *Lysigypa morosoides* sp. n.

Diagnosis: Shell smooth, non-costate, devoid of the fold and sulcus; anterior commissure rectimarginate or very slightly curved either in ventral or, less commonly, in dorsal direction. Ventral beak robust, palintrope not defined by any edges. Pedicle valve with a thick inner prismatic layer; spondylium rather large, of lamellar calcite, free except for its posterior part that is supported by a very short median septum, partly embedded in the prismatic layer. Dorsal plates lyre-shaped in cross-section; they converge to the valve floor to form a cruralium sedens; bases of septal plates touch each other both umbonally and anteriorly, but — in contrast to *Sieberella* — never fuse into a median septum. Brachial valve much less convex and less thick-walled that the pedicle valve.

Comparison: *Lysigypa* is a probable descendant of *Gashaomiaoia* Rong, Su & Li differing from the latter in having a thick prismatic layer in its pedicle valve, and parallel bases of septal plates that touch each other along their whole length; on the other hand, both the valves of *Gashaomiaoia* are of lamellar calcite; further, the bases of septal plates gently diverge forward in the latter genus.

Remarks to synonymy of *Gashaomiaoia:* Smooth surface of both valves, absence of a fold and sulcus, lamellar structure of the shell, short median septum supporting spondylium, and subparallel bases of the septal plates are features common to *Gashaomiaoia* Rong, Su & Li, 1985 and *Lysidium* Havlíček, 1985; it is then apparent that the two taxa cannot be treated as separate genera. The paper dealing with *Gashaomiaoia* appeared in September, 1985, whereas the diagnosis of *Lysidium* was published in October in the same year. For this reason, the name of *Lysidium* is to be considered as a junior synonym of *Gashaomiaoia.*

Lysigypa morosoides sp. n.

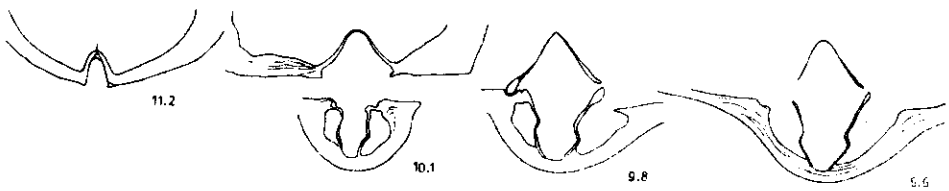
Pl. VI, fig. 2; pl. VII, fig. 7; text-figs. 7, 8

Holotype: Shell figured on pl. VI as fig. 2; VH 4817b.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 22 specimens.

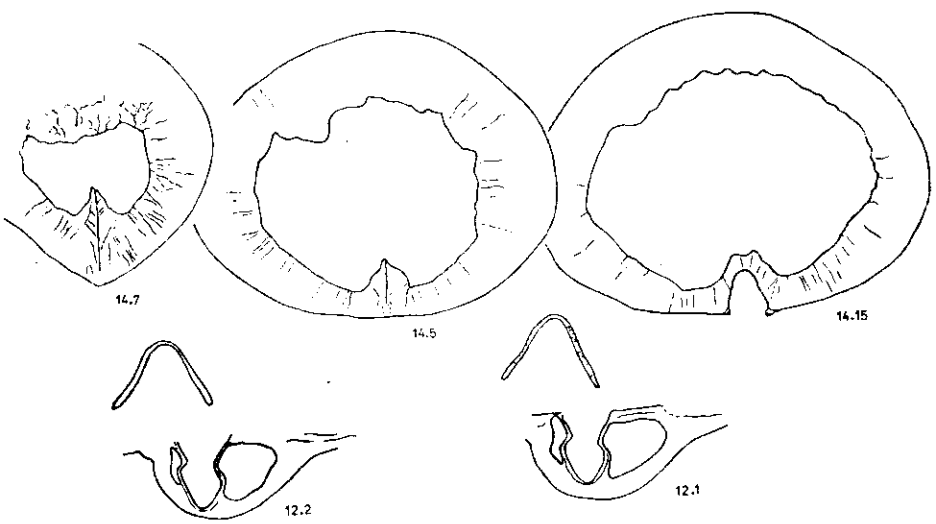
Exterior: Shell ventri-biconvex, nearly globose, 14.0—18.6 mm wide in adults, and 60—63 % as high as maximum width in young specimens, 63—67 % in adults, and 68—71 % in gerontic specimens. Shell smooth, devoid of both the fold and sulcus; anterior commissure either slightly curved ventrally, rectimarginate, or faintly curved dorsally. Pedicle valve slightly shorter than its maximum width (90—100 % as long as wide), with a robust, strongly incurved beak that considerably extends beyond the hinge line. Ventral palintrope not bounded by edges; delthyrium filled by the beak of the opposite valve. In lateral profile, pedicle valve strongly and evenly convex.

Brachial valve elliptical to subcircular in outline, 80—84 % as long as maximum width, with gently raised and moderately incurved beak. Surface smooth; exceptionally, weak growth lines and weak, densely crowded pits present.

Interior: See text-figs. 7, 8 and diagnosis of the genus. Vascula media and lateralia developed as two pairs of straight, narrow, divergent canals gently inserted in the shell; genital markings faintly impressed.



7. *Lysigypa morosoides* sp. n.; transverse serial sections, ×5



8. *Lysigypa morosoides* sp. n.; transverse serial sections, ×5

Comparison: *L. morosa* (Havl.) (Dvorce-Prokop Limestone) is distinguished by extremely thick-walled pedicle valve with considerable secondary-shell accumulations on its inner side, lateral to the spondylium; for this reason, the pallial markings are deeply excavated in the shell of *L. morosa,* whereas those of *L. morosoides* form shallow, straight canals, impressed in a less thick wall of the pedicle valve.

Occurrence: Suchomasty Limestone, locality 5.

Gypidulina Ržonsnickaja, 1956

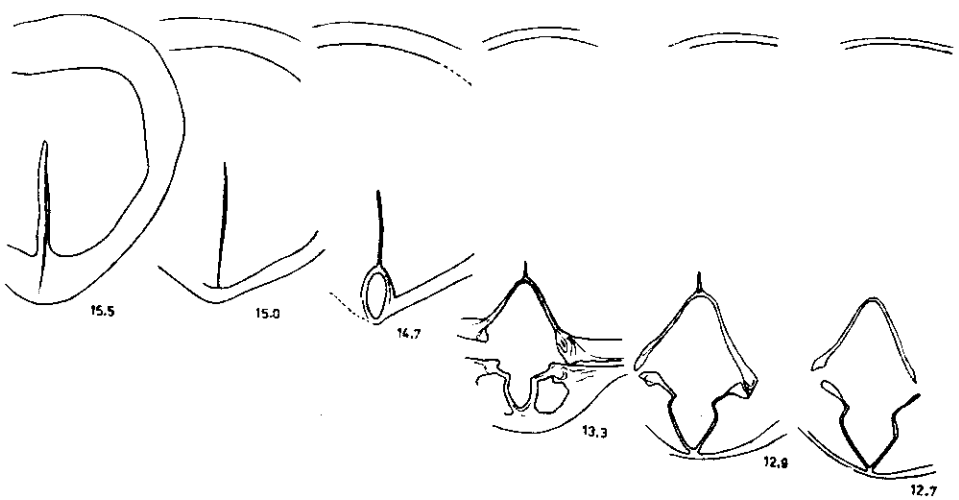
Gypidulina ariadna sp. n.

Pl. VI, fig. 5; text-fig. 9

Holotype: Shell figured on pl. VI as fig. 5; VH 4814a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 6 shells and 1 pedicle valve.

Exterior: Shell 13.0—20.7 mm wide, with pedicle valve much higher than the gently convex brachial valve; pvL/W — 89.6—94.5 %; bvL/W — 71,3—84.4 %; shT/W — 76.2—84.4 %. Pedicle valve strongly and evenly convex in lateral profile, with a strongly inflated beak. Ventral fold low, rather narrow (about 50 % or even less of the maximum width), originating posterior to the mid-length of valve, bounded laterally by weak plications which may be reduced into weak, rounded edges in some specimens. Top of the fold flat or even slightly concave.

Brachial valve transversely elliptical; beak gently raised; sulcus confined to the anterior part of the valve, where it is narrow and rather deep, bordered by rounded edges; tongue prominent, trapezoidal.



9. *Gypidulina ariadna* sp. n.; transverse serial sections, ×12

Ribs weak to indistinct; a short, low plication usually occupies the bottom of the sulcus; fold bears 2 or 3 very weak plications, the flanks are either devoid of ribbing or the lateral commissures are slightly undulated.

Interior: It is closely similar to that of *G. optata* (Barr.) (see text-fig. 9).

Comparison: *G. optata* (Barr.) is much larger than the new species (it is 31—54.5 mm wide in adults) and has a broader fold and sulcus. Internally, the septal plates and brachial plates are of about the same size in *G. optata* (see Havlíček 1985b, text-figs. 3, 4), whereas the septal plates in *G. ariadna* are clearly larger than both the brachial plates and bases of the brachial apparatus.

Occurrence: Suchomasty Limestone, locality 5.

Gypidula Hall, 1867

Gypidula sp.

Pl. VI, fig. 6

Material: One shell (its brachial valve damaged by flattening).

Remarks: Shell rather large (26.1 mm wide) with a low fold appearing in front of the beak; dorsal sulcus rather deep in anterior part of the valve. Ribs rounded, originating in front of both beaks, unequal in size; the strongest are the ribs bounding laterally the fold and sulcus; bottom of sulcus occupied by two low ribs; one rib is located in a median depression between the strong costae on the top of the fold. Lateral ribs obscure. Fine granules observed only at anterior margin of the pedicle valve. Interior not investigated.

Occurrence: Suchomasty Limestone, locality 5.

Clorindidae Ržonsnickaja, 1956

Clorinda Barrande, 1879

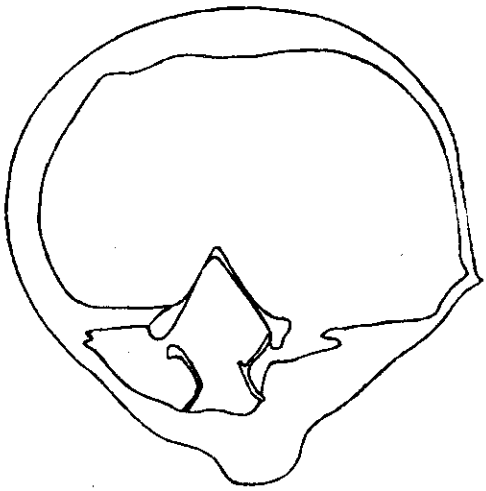
Clorinda exarmata sp. n.

Pl. VII, figs. 1, 2; text-fig. 10

Holotype: Shell figured on pl. VII as fig. 2; VH 4818b.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 27 shells.

Exterior: Shell closely similar to that of *C. armata* Barr. with the following features: shW — 6.5—12.4 mm; pvL/W — 83.0—101.0 %; bvL/W — 81.4—91.2 %; shT/W — 66.0—72.5 %. Pedicle valve more con-

vex umbonally than anteriorly or almost evenly convex in lateral profile, with a small, strongly incurved beak moderately extending beyond the hinge line; delthyrium not exposed for examination as it is covered with the beak of the opposite valve. Sulcus appears at or anterior to mid-length of the valve as a very shallow to almost indistinct depression, hardly discernible from the flanks, with a flat or very slightly convex bottom; tongue high, arcuate.



10. *Clorinda exarmata* sp. n.; transverse section, ×7

Brachial valve moderately wider than long, with a moderately raised beak; fold well-developed in anterior part of the valve where it occupies more than half-width of the valve (exceptionally up to 70 % of the maximum width). Fold highly elevated, rounded in cross-section, bounded laterally by rounded depressions. In side view, its top is moderately convex umbonally, nearly flat in the mid-length, and gently curved dorsally near the front margin.

Interior: The same as in *C. armata.*

Comparison: Brachial valve of *C. armata* Barr. is transversely elliptical, that of *C. exarmata* subcircular (81.4—91.2 % as long as wide); further, the top of the fold in *C. armata* is straight in lateral profile, that of the new species is straight in its mid-length but clearly raised dorsally in its anterior part.

C. exarmata may be derived from *C. maiderensis* Drot (Pragian, Morocco; Drot 1969); the latter species is somewhat larger (12.0—17.3 mm wide in specimens figured by Drot 1969) and has obscure fold and low tongue, whereas *C. exarmata* is distinguished by a short, but highly raised fold and highly arcuate tongue.

Occurrence: Suchomasty Limestone, localities 5, 8.

Clorinda robustisella sp. n.

Pl. VI, figs. 3, 4; text-fig. 11

?1879 *Pentamerus linguiferus* Sow.; Barrande (partim), pl. 24, case III, figs. 6, 8.

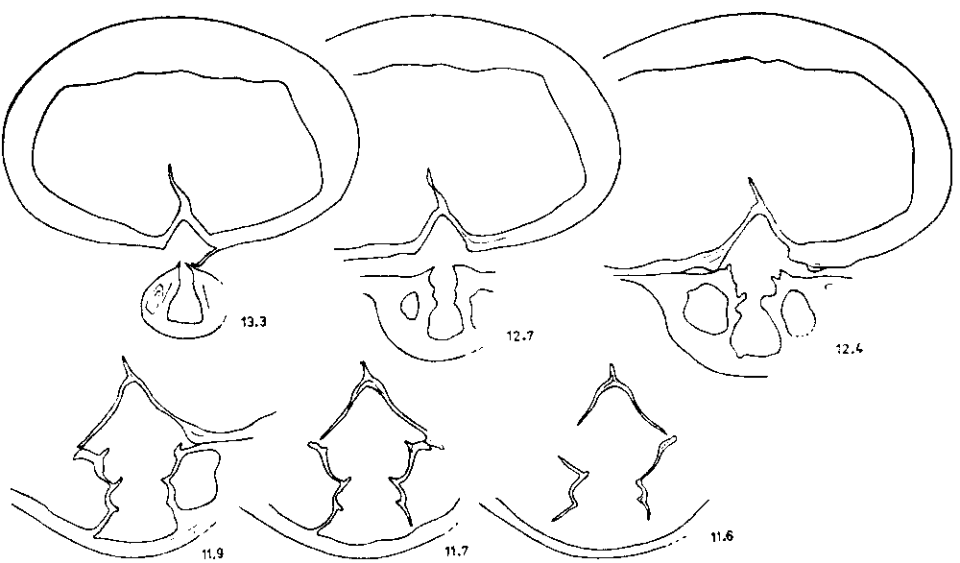
Holotype: Shell figured on pl. VI as fig. 3; VH 4819a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 31 shells.

Exterior: Shell smooth, ventri-biconvex, with the following features: shW — 12.5—17.8 mm; pvL/W — 72.2—84.1 %; bvL/W — 60.4—71.9 %; shT/W — 56.0—97.9 % (this broad range of variation depends on age and size of the specimens investigated, and the size of the fold).

Pedicle valve strongly convex in lateral profile, with a shallow sulcus starting at the beak; bottom of sulcus gently concave posteriorly but nearly flat in anterior part of the valve. Ventral beak overhangs the dorsal beak, delthyrium not exposed for examination.

Brachial valve transversely elliptical, widest at or posterior to its mid-length, with a rounded, highly raised and rather narrow fold extending along the full length of the valve. In contrast to *C. armata* and *C. exarmata,* the fold of *C. robustisella* is clearly developed even in umbonal region as a ridge rounded in cross-section. In side view, top of the fold is moderately convex umbonally but flat anteriorly. Tongue very high, arcuate.

Interior: See text-fig. 11.



11. *Clorinda robustisella* sp. n.; transverse serial sections, ×5

Comparison: *C. baccalaria* sp. n. clearly differs from the coeval *C. robustisella* in bearing a strong plication in its weak sulcus.

Remarks: Gortani (1915) erected *Pentamerus linguifer bohemicus* as a new subspecies based on the Silurian and Devonian specimens described by Barrande (1879) under the name *Pentamerus linguiferus* Sow. Gortani designated no shell as the type specimen; in order to avoid any mistake in concept of *P. linguifer bohemicus*, we are selecting the shell figured by Barrande on pl. 22 as fig. 4 as the lectotype. This shell comes from the Motol Formation and is closely related to *Antirhynchonella ancillans* (Barr.). The Devonian shells figured by Barrande (1879) on pl. 24, case III, as figs. 6 and 8, are externally similar to *C. robustisella*, but they are not available for the study (are they lost?); for this reason, none of them could be used as the lectotype.

Occurrence: Suchomasty Limestone, localities 5, 8.

Clorinda baccalaria sp. n.

Pl. VI, fig. 1; pl. VII, figs. 4, 6

Holotype: Shell figured on pl. VI as fig. 1; VH 4821c.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 14 shells and 3 pedicle valves.

Exterior: Shell rather large, 16.0—18.7 mm wide, ventri-biconvex; pvL/W — 78.4—94.6 %; bvL/W — 69.8—87.1 %; shT/W — 68.1—74.3 %. Pedicle valve sligthly wider than long, strongly and evenly convex in lateral profile, with a strongly incurved beak. Sulcus very shallow to indistinct, originating in front of the beak, anteriorly extending into a prominent, rounded tongue. Bottom of sulcus occupied by a broad plication that is better developed on the tongue than in the posterior part of the valve.

Brachial valve transversely elliptical, widest at or posterior to its mid-length; fold rather narrow posteriorly, extending from the beak, moderately expanding forward, rounded in cross section; in anterior part of the valve, it occupies 2/3—3/4 of the maximum width of the shell.

Interior: See pl. VII, fig. 6.

Comparison: *C. baccalaria* is distinguishable from *C. armata* Barr. (Zlíchov Limestone) in its larger size, presence of very shallow sulcus bearing a mid-plication, and presence of a highly elevated fold originating near the beak. Unlike the new species, *C. armata* lacks the ventral sulcus and its rounded fold is discernible only in the anterior part of the brachial valve. Further, the delthyrium is open in *C. armata* but covered by the dorsal beak in *C. baccalaria*.

Occurrence: Suchomasty Limestone, locality 5.

Clorinda acrimona sp. n.

Pl. VII, figs. 3, 5

Holotype: Shell figured on pl. VII as fig. 5; VH 4820b.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 22 shells.

Exterior: Shell medium to large in size, ventri-biconvex; shW — 11.2—17.7 mm; pvL/W — 78.3—84.8 %; bvL/W — 52.5—68.9 %; shT/W — 67.5—86.5 %. Pedicle valve strongly convex in lateral profile, with a strong, incurved beak; delthyrium blocked up by the beak of the opposite valve; sulcus originates at the beak, gradually broadens forward, and extends into a high, triangular tongue directed dorsally. Sulcus V-shaped in cross-section, deepest at about its mid-length, rather shallow at the tongue; its longitudinal axis accentuated by an angular groove.

Brachial valve transversely elliptical; strong fold originates just at the beak as a narrow, highly raised ridge and reaches its maximum size at the front margin of the valve, where it occupies 3/5—2/3 of the maximum width of the shell; fold separated by rounded depressions from the gently convex flanks. In cross section, the fold is roundedly angular to angular.

Interior: The same as in *C. armata* Barr.

Comparison: *C. acrimona* differs from *C. baccalaria* in having a roundedly angular to angular fold and a rather deep, V-shaped sulcus; instead of a broad plication present in the sulcus of *C. baccalaria, C. acrimona* has an angular groove in the longitudinal axis of its sulcus.

C. garretti Perry (Delorme Fm., late Lochkovian to earliest Pragian, the Yukon, Canada; Perry 1984) is closely similar to *C. acrimona* in that it has a high, angular fold in the brachial valve. It is easily distinguishable from the Bohemian species by its shallow, smoothly concave sulcus, whereas the sulcus of *C. acrimona* is deep, V-shaped in cross-section, with a groove in the longitudinal axis.

Occurrence: Suchomasty Limestone, localities 5, 3.

Clorinda strix (Barrande, 1879)

Pl. VIII, figs. 1, 2; text-fig. 12

1879 *Pentamerus strix* Barr.; Barrande, pl. I, figs. 11, 12.

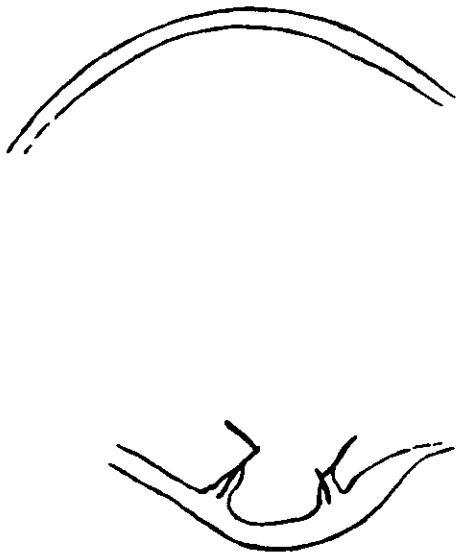
Lectotype (SD herein): Shell figured by Barrande on pl. I as fig. 12 (not available).
Type horizon and locality: Acanthopyge Limestone, Koněprusy.
Material: 18 shells and several valves.

Exterior: Size and shape of the shell similar to those of *C. ex-*

armata except for lacking a ventral sulcus; dorsal fold low, short, tongue very low, arcuate. Pedicle valve 86.6—107.0 % as long as wide.

Interior: See text-fig. 12.

Occurrence: Acanthopyge Limestone, localities 6, 11, 10.



12. *Clorinda strix* (Barrande); transverse section, ×12

Rhynchonellacea Schuchert, 1896

Pugnacidae Ržonsnickaja, 1956

Corvinopugnax Havlíček, 1961

Corvinopugnax corvinus (Barrande, 1847)

Pl. VIII, fig. 3

1961 *Corvinopugnax corvinus* (Barrande, 1847); Havlíček, p. 37, pl. 13, figs. 2, 3; text-figs. 5, 6.

Occurrence: Suchomasty Limestone, locality 5.

Isopoma Torley, 1934

Isopoma alecto (Barrande, 1847)

1961 *Isopoma alecto* (Barrande, 1847); Havlíček, p. 40, pl. 6, fig. 5; text-fig. 7.

Occurrence: Suchomasty Limestone, locality 3.

Errhynx Havlíček, 1982

Errhynx sp.

Pl. XIII, fig. 2

1982 *Errhynx* sp.; Havlíček, pl. 1, figs. 13, 14.

Occurrence: Acanthopyge Limestone, Koněprusy (old collection; a single shell available).

Trigonirhynchiidae McLaren, 1965

Iberirhynchia Drot & Westbroek, 1966

Iberirhynchia nargis (Havlíček, 1961)

Pl. VIII, fig. 4

1961 *Nymphorhynchia nargis* sp. n.; Havlíček, p. 92, pl. 10, fig. 2.

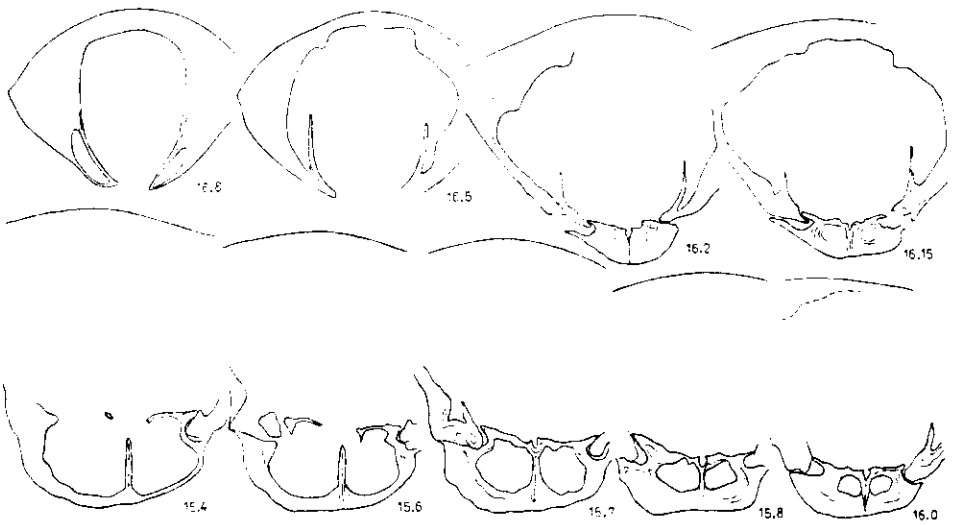
Occurrence: Suchomasty Limestone, Zlatý kůň (a single shell found by M. Šnajdr).

Astutorhyncha Havlíček, 1961

Type species: *Terebratula proserpina* Barrande, 1847.

Diagnosis (emended): Shell transverse, medium to large in size (17—30 mm wide), in early growth stages lenticular in lateral profile with a gently curved anterior commissure, in adults high, nearly cuboidal but never truncated anteriorly. Pedicle valve planar in posterior view; in sagittal profile, its maximum curvature occurs in anterior part where the shallow sulcus passes into a high tongue. Ventral beak moderately incurved, bounded laterally by sharp and long edges separating the low postero-lateral walls from the rest of the valve. Deltidial plates probably absent. Dorsal fold low, flat-topped, in side view moderately convex so that its highest part occurs posterior to its anterior margin. Ribs rounded, broader than interspaces, never bifurcating, in umbonal region weak to indistinct but strong anteriorly. Sulcus occupied by 5—6 (rarely by 4 or 7) ribs, flanks bear 3—5 (exceptionally even more) costae; parietal ribs absent or weak; anterior commissure serrate and uniplicate.

Both valves thick-shelled; teeth minute, medianly inclined; dental plates very short (less than a tenth of the valve length), lateral cavities mostly filled by secondary shell material; ventral muscle field elongate-oval, deeply impressed.



13. *Astutorhyncha proserpina* (Barrande); transverse serial sections, ×5

Septalium minute, resting on a strong median septum, U-shaped in cross-section, never bridged over by a connective band; cardinal process absent; dorsal muscle field small, elongate, gently impressed.

Comparison: *Eoparaphorhynchus* Sartenaer (Upper Devonian) differs from *Astutorhyncha* in having angular ribs and lacking prominent edges bounding postero-laterally the ventral beak; further, its septalium is deeper and its dental plates converge towards the valve floor.

Astutorhyncha proserpina (Barrande, 1847)

Pl. VIII, figs. 7, 8; text-fig. 13

1961 *Astutorhyncha proserpina* (Barrande, 1847); Havlíček, p. 107, pl. 12, figs. 3—7; text-figs. 40, 41.

Occurrence: Suchomasty Limestone, localities 5, 8.

*Uncinulidae*Ržonsnickaja, 1956

Markitoechia Havlíček, 1959

Markitoechia omissa Havlíček, 1961

Pl. X, fig. 4

1961 *Markitoechia omissa* n. sp.; Havlíček, p. 150, pl. 25, figs. 8—10; text-fig. 59.

Occurrence: Suchomasty Limestone, mostly old collections; a single shell found at locality 5.

Markitoechia clavula sp. n.

Pl. IX, fig. 2

Holotype: Shell figured on pl. IX as fig. 2; VH 3317b.
Type horizon and locality: Suchomasty Limestone, locality 8.
Material: 46 shells.

Exterior: Shell small, 5.3—5.9 mm wide, and 76—91 % as high as maximum width, anteriorly and laterally truncated. Pedicle valve elongate, 103—112 % as long as wide, with fairly long and nearly straight postero-lateral sides containing about a right angle (88—95°); ventral beak incurved, terminating with a small, sharp apex directed posterodorsaly. Deltidial plates present.

Sulcus confined to the anterior part of valve where it is formed as a moderately deep depression rounded in cross-section. Rarely, floor of the sulcus is flat or even slightly convex. Tongue high, rectangular.

Brachial valve pentagonal in outline, with a short fold originating at about 2/3 of the valve length; top of the fold convex, bearing low, rounded ribs.

Posterior part of both valves smooth; sulcus occupied by 3 (exceptionally 2 or 4) rounded ribs much broader than the interspaces; ribs on the fold short, rounded, whereas those on the tongue and truncated walls are flat, medianly grooved and crossed by fine growth lines in a zig-zag arrangement; marginal spines present.

Interior: The same as in *M. marki* (Havl.).

Comparison: The earlier (Zlichovian) species *M. marki* (Havl.) is moderately larger and has more ribs in the sulcus and on the fold; it is 6.0—8.0 mm wide with a pentagonal brachial valve, usually slightly wider than long or slightly elongate (pvL/W — 98—104 %), exceptionally moderately elongate (pvL/W — 105—112 %; about 5 % of specimens in the population). By contrast to *M. clavula*, the sulcus of *M. marki* is very short and shallow with a flat or gently convex floor, rarely with a slightly concave floor usually bearing 6—7 costellae (exceptionally 5 costellae).

Occurrence: Suchomasty Limestone, localities 5 (rare), 8 (frequent), 17 (one shell).

Kransia Westbroek, 1967

Kransia aff. *parallelepipeda* (Bronn, 1837)

Pl. IX, fig. 1

1972 *Kransia* aff. *parallelepipeda* (Bronn, 1837); Mohanti, p. 161, pl. 3, fig. 6; pl. 4, figs. 1, 2; text-figs. 17, 18.

Occurrence: Acanthopyge Limestone, locality 7 (one shell only). Northeastern Spain, Cantabrian Mts., Member B of the Portilla Fm. (Middle Devonian) (Mohanti, 1972).

Taimyrrhynx Havlíček, 1982

Taimyrrhynx rufus sp. n.

Pl. VIII, fig. 5

Holotype: Shell figured on pl. 8 as fig. 5; VH 3329b.
Type horizon and locality: Suchomasty Limestone, locality 9.
Material: One shell, one pedicle valve, and several incomplete valves.

Exterior: Size and overall shape of shell nearly the same as in *T. knjaspensis* (Chodalevič); dimensions of the holotype: shW: 17.3 mm; pvL: 14.0 mm; shT: 14.1 mm; suW: 9.5 mm.

Sulcus shallow, bounded laterally by gently elevated flanks; bottom of sulcus nearly flat. Fold short, with a slightly convex top and low, steep sides. Tongue high, trapezoidal; its margin slightly curved. Anterior commissure straight to gently undulate.

Ribs fine, rounded-angular, well discernible even in umbonal regions of both valves, of uniform size over most of the shell surface, increasing in number by bifurcation; sulcus bears 15—19 ribs, parietal ribs 4—5; on anterior and lateral vertical walls, all the ribs flattened and medianly grooved as in other uncinulids; marginal spines present.

Interior not known adequately.

Comparison: *T. rufus* is closely similar to the coeval *T. knjaspensis* (Chodalevič) (Eifelian, east slope of the Ural Mts., Sverdlovsk region; Chodalevič 1951); the latter species, however, has a rectangular tongue with parallel sides, and ribs arranged in poor bundles in posterior part of the shell where the costellae are clearly stronger than anteriorly. By contrast, the fascicostellate character of the ornamentation has not been found in the Bohemian species. Further, the anterior commissure is serrate in *T. knjaspensis* but nearly straight in *T. rufus*.

Occurrence: Suchomasty Limestone, locality 9.

Septalariidae Havlíček, 1960

Septalaria Leidhold, 1928

Septalaria palumbina (Barrande, 1879)

Pl. IX, fig. 3

1961 *Septalaria palumbina* (Barrande, 1879); Havlíček, p. 182, pl. 27, figs. 1—5; text-fig. 82.

Occurrence: Suchomasty Limestone, localities 3, 5, 8.

Amissopecten Havlíček, 1960

Amissopecten velox (Barrande, 1847)

Pl. IX, figs. 7, 8

1961 *Amissopecten velox* (Barrande, 1847); Havlíček, p. 185, pl. 22, figs. 3—6; text-figs. 83, 84.

Occurrence: Suchomasty Limestone, locality 5. Acanthopyge Limestone, localities 6, 7, 11.

Amissopecten obsolescens (Barrande, 1879)

Pl. IX, fig. 6; pl. X, fig. 1

1961 *Amissopecten obsolescens* (Barrande, 1879); Havlíček, p. 187, pl. 27, fig. 12.

1986 *Amissopecten obsolescens* (Barrande, 1879); Havlíček - Pek, p. 19, pl. 2, figs. 9—12; text-figs. 1, 2.

Remarks: *"Atrypa" assula* (Barrande, 1879, pl. 93, fig. I-3; pl. 146, fig. I-1) may represent young shells of *A. obsolescens*; to stabilize the nomenclature, the shell figured by Barrande (1879) on pl. 146 as fig. I-1 is selected herein as the lectotype of the invalid species *Atrypa assula.*

Occurrence: Suchomasty Limestone, locality 5. Acanthopyge Limestone, locality 2 (bank with *Acanthopyge haueri, Amplexus florescens* and *Quasidavidsonia mediocarinata*). Moravia, Horní Benešov in the Nízký Jeseník Mts., Chabičov Member (= upper part of the Stínava-Chabičov Formation, Eifelian).

Monadotoechia Havlíček, 1960

Monadotoechia monas (Barrande, 1847)

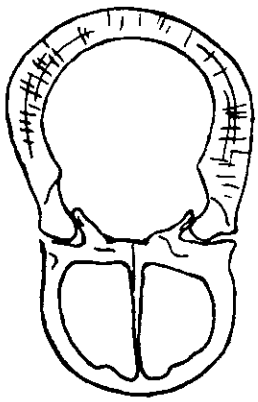
Pl. IX, figs. 4, 5; text-figs. 14, 15

1961 *Monadotoechia monas* (Barrande, 1847); Havlíček, p. 193, pl. 26, figs. 11, 12.

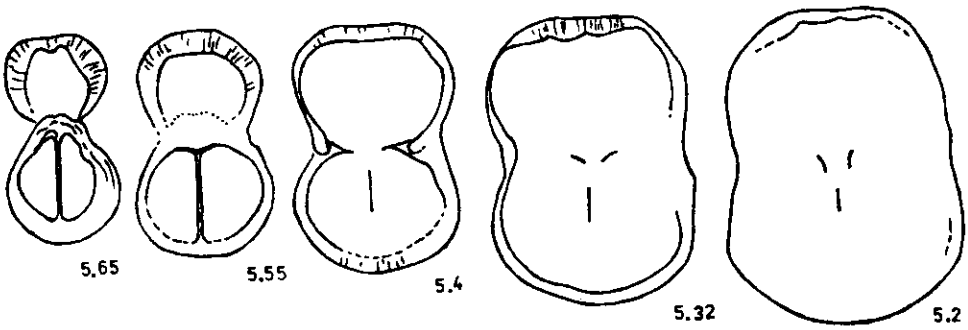
1961 *Monadotoechia monadina* n. sp.; Havlíček, p. 194, pl. 26, figs. 9, 10; text-fig. 87.

Remarks: The "monas" type ribbing consists of 4 equally strong costae on the fold, whereas the "monadina" type ribbing is formed by two anteriorly bifurcating costae. The recently collected material has shown existence of gradual transition between the two types of ribbing; for this reason, *Monadotoechia monas* and *M. monadina* are supposed to be conspecific.

Occurrence: Suchomasty Limestone, localities 15, 17.



14. *Monadotoechia monas* (Barrande); transverse section, ×12



15. *Monadotoechia monas* (Barrande); transverse serial sections, ×9

Wellerellidae Licharev in Ržonsnickaja, 1956

Remarks: Havlíček (1961) considered *Tetratomia* to be the earliest genus of the *Wellerellidae,* a family that was rather common in the Carboniferous and Permian and survived till the Mesozoic. Inner morphology of *Tetratomia,* however, needs further investigation.

Tetratomia H. Schmidt, 1941

Tetratomia coalescens sp. n.

Pl. VIII, fig. 6

Holotype: Shell figured on pl. VIII as fig. 6; VH 4157.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 10 shells and several incomplete specimens.

Exterior: Shell 3.6—4.6 mm wide, nearly globose, 63.9—75.5 % as high as maximum width, by overall shape and size closely similar to

T. amanshauseri (Dahmer) (uppermost Lower Devonian, Rhineland). Pedicle valve pentagonal in outline, 100—102 % as long as wide; ventral beak small, incurved, its apex directed postero-dorsally; shoulder angle 92—100°; sulcus shallow, originating at a quarter to a third of the valve length, anteriorly extending into a short, trapezoidal tongue. Brachial valve moderately convex with a low fold appearing at about the mid-length.

Ribs angular, separated by angular interspaces, counting 11—13, all extending from the posterior margin; bifurcation not established. Interesting are the submedian ribs of the first and second pairs which often coalesce in anterior part of the pedicle valve into strong costae bounding the sulcus; for this reason, the sulcus bears only a slender mid-rib. In case that the submedian ribs do not coalesce into stronger ones, the floor of the sulcus is occupied by three slender ribs. Fold bears 2 or 4 angular ribs.

Interior: Not investigated.

Comparison: *T. amanshauseri* (Dahmer) differs from the new species in having only one rib in the sulcus, two ribs on the fold, and never developing coalescing costae in the anterior part of the pedicle valve. By contrast, the coalescing ribs are a significant feature of that part of population of *T. coalescens* that bears a single rib in its sulcus.

Occurrence: Suchomasty Limestone, locality 5.

Atrypacea Gill, 1871

Lissatrypidae Twenhofel, 1914

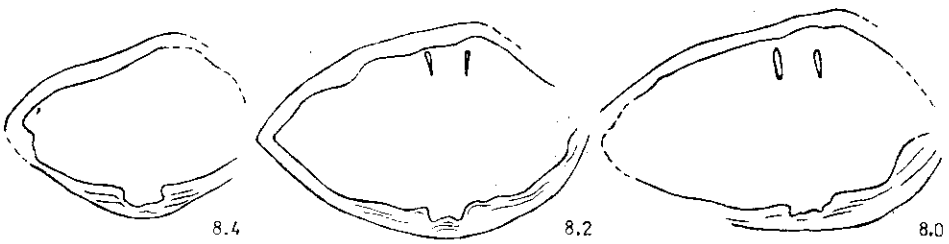
Trigonatrypa g. n.

Type species: *Meristella holynensis* Havlíček, 1956.

Diagnosis: Shell smooth, triangular to pentagonal in outline, widest in 2/3 or 3/4 of its length; anterior commissure rectimarginate to uniplicate; postero-lateral commissures located either on sharp edges or on nearly vertical walls. Ventral beak short, gently to moderately incurved, palintrope small, apsacline to orthocline; deltidial plates minute, less commonly missing (in *T. holynensis*). Ventral sulcus absent or formed as a very broad, shallow depression; dorsal fold absent.

Pedicle valve thin-walled and devoid of dental plates in the earlier (Zlíchovian—Dalejan) species becoming rather thick-walled in the Eifelian species that have short, moderately diverging dental plates. Ventral muscle field triangular, gently impressed, in the Eifelian species underlain anteriorly by a low pad of secondary shell material. Hinge plates disjunct, massive, underlain by pads of secondary shell material, se-

parated from dental sockets by moderately elevated rigdes; inner margins of hinge plates raised in the form of short ridges serving as crural bases. Crura slender, ventrally to postero-ventrally curved, touching almost the inner surface of the pedicle valve. Spiral cones and jugal processes not discovered. Dorsal muscle field elongate, weakly impressed, bisected by a myophragm.



16. *Trigonatrypa holynensis* (Havlíček); transverse serial sections, ×10

Trigonatrypa is confined to both the quiet, deeper-water environment of nodular, muddy limestone inhabited by trilobites of the *Phacops-Struveaspis* Assemblage in about B.A. 4—5 life zone, and the very shallow-water environment of bioclastic limestone in the Koněprusy area (*Karbous-Orbitoproetus* and *Karbous-Acanthopyge* Communities).

Comparison: *Trigonatrypa* may have been derived from *Glassia* Davidson (recently revised by Copper 1986); it differs from the latter in having triangular (less commonly pentagonal) shells widest in 2/3 or 3/4 of their length, always lacking a dorsal fold or sulcus, and having a very broad, shallow ventral sulcus. Unlike the new genus, *Glassia* is rounded to elliptical in outline, its shell is rectimarginate and often bisulcate. Unfortunately, the spiral cones have not been discovered in many Bohemian species; for this reason, attribution of *Trigonatrypa* to the *Glassiinae* is not sure.

Trigonatrypa baucis (Barrande, 1847)

Pl. X, fig. 2; pl. XII, fig. 5; text-figs., 17, 18.

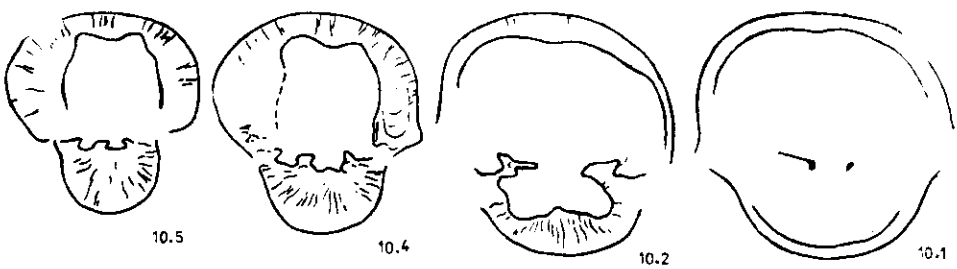
1847 *Terebratula Baucis* Barr.; Barrande, p. 389, pl. 16, fig. 7.
1879 *Merista? Baucis* Barr.; Barrande, pl. 17, case IV, figs. 1—11.

Lectotype (SD herein): Shell figured by Barrande in 1847 on pl. 16 as figs. 7a—7c; refigured by Barrande in 1879, pl. 17, case IV, fig. 10; L 23982.
Type horizon and locality: Acanthopyge Limestone, Koněprusy.
Material: More than 50 shells (partly old collections).

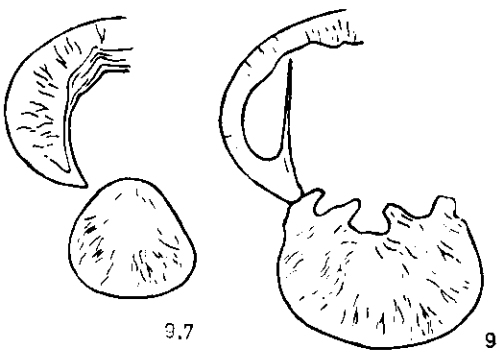
Exterior: Shell subequally biconvex, variable in size and shape, 11.0—17.5 mm wide in adult specimens, 41—51 % as high as wide in

young shells (smaller than 7.5 mm) becoming 52—59 % as high as the maximum width in late adults. Pedicle valve triangular in outline, usually elongate (103—107 % as long as wide), less commonly wider than long (89—100 % as long as wide). Postero-lateral margins long, straight, containing an acute angle varying from 69° to 82°. Widest part of pedicle valve at about the anterior third of its length; in ventral view, anterior margin gently arcuate to straight. Ventral beak short, gently incurved, terminating with a sharp apex directed postero-dorsally. Deltidial plates present, pedicle foramen not examined due to an imperfect state of preservation. Ventral sulcus ill-defined; if present, it forms a very shallow depression with a flat to slightly concave bottom. Longitudinal axis of ventral sulcus accentuated by a narrow groove originating posterior to mid-length of valve, and not expanding forward. Anterior commissure bent in dorsal direction.

Brachial valve evenly convex in lateral profile, devoid of a fold. In posterior view, the postero-lateral portions of both valves deflected towards the commissure to form low, very steep to vertical walls. Surface smooth, no growth lines observed; exceptionally, both valves bear weak radial plications near anterior margins (e.g. the shell figured by Barrande in 1847 pl. 16, fig. 7d; and refigured by him in 1879, pl. 17, case IV, fig. 11d, has 6—7 weak, rounded plications).



17. *Trigonatrypa baucis* (Barrande); transverse serial sections, ×7



18. *Trigonatrypa baucis* (Barrande); transverse serial sections, ×12

Interior: Shell walls rather thick, consisting of a fibrous, outer layer, and a prismatic, inner layer. Dental plates short, divergent. Ventral muscle field small, triangular, anteriorly underlain by a low pad of secondary material.

Cardinal process absent; hinge plates solid, disjunct; dorsal muscle field elongate, surrounded by ridges, bisected by a myophragm, about 1/6—1/7 as broad as the maximum width of the valve, and occupying about 1/3 of the valve length.

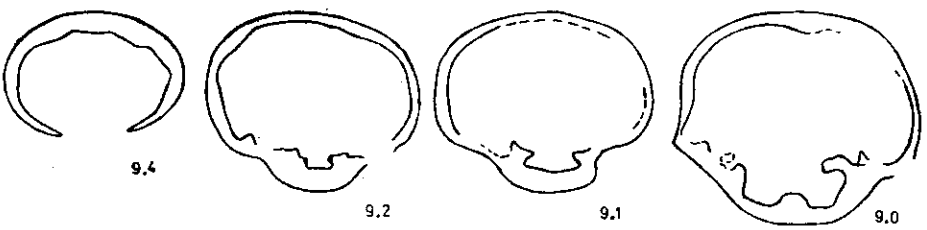
Occurrence: Acanthopyge Limestone, localities 2, 6, 7, 10, 11.

Trigonatrypa protobaucis sp. n.

Pl. X, fig. 3; text-fig. 19

Holotype: Shell figured on pl. X as fig. 3; VH 3322b.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 16 shells.

Exterior and interior: Externally not distinguishable from *T. baucis* but thin-walled, lacking dental plates, and with a hardly impressed ventral muscle field.



19. *Trigonatrypa protobaucis* sp. n.; transverse serial sections, ×7

Comparison: *T. baucis* differs from the new species in being thick-walled and in having short, moderately diverging dental plates.

T. holynensis (Třebotov Limestone; *Phacops-Struveaspis* Assemblage) differs from the new species in having the maximum width of its shell at about 3/4 of its length; further, lateral commissures are located on sharp edges, and the anterior commissure is nearly rectimarginate in *T. holynensis* but uniplicate in *T. protobaucis*. Moreover, ventral beak of *T. holynensis* is so incurved that it rests on the beak of the opposite valve, while that of *T. protobaucis* is apsacline to orthocline, not touching the dorsal beak.

Occurrence: Suchomasty Limestone, localities 2, 3, 5, 8, 12.

Trigonatrypa securis (Barrande, 1847)

Pl. X, fig. 5; pl. XI, fig. 1

1847 *Terebratula Securis* Barr.; Barrande, p. 388, pl. 16, fig. 1.

1879 *Merista Securis* Barr.; Barrande, pl. 17, case III, figs. 1—10; pl. 142, case V, fig. 1.

Holotype: Shell figured by Barrande in 1847; refigured by Barrande in 1879 on pl. 17, case III, as fig. 9; L 25316.

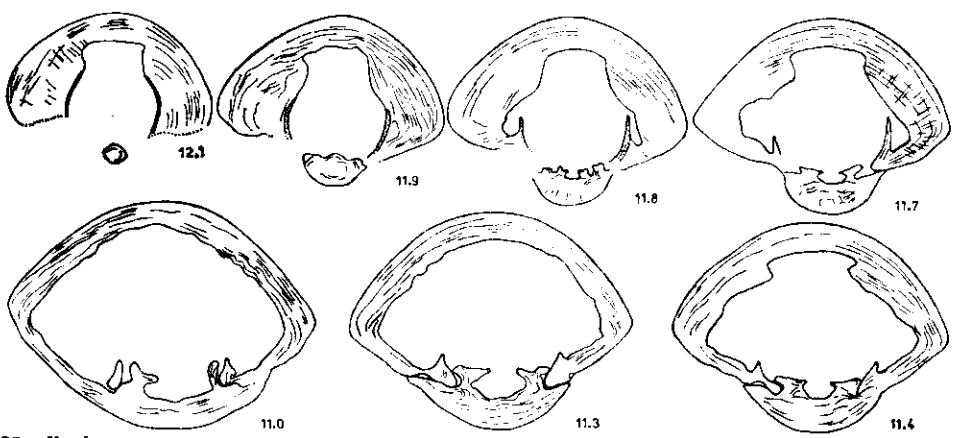
Type horizon and locality: Acanthopyge Limestone, Koněprusy.

Material: one shell from the Suchomasty Limestone, and 10 specimens from the Acanthopyge Limestone (old collections).

Exterior: Shell pentagonal in outline, subequally biconvex, 89—100 % as long as maximum width, exceptionally conspicuously elongate, widest at about 2/3—3/4 of the pedicle-valve length; 11.5—18.0 mm wide in adult specimens, and 42—47 % as high as maximum width. Anterior margin of shell usually straight or even slightly emarginate. In lateral profile, both valves moderately and evenly convex; adult pedicle valves bear a median flattening that often changes into a very shallow, not clearly differenciated, sulcus. Median depression in the brachial valve of the same kind as that in the pedicle valve; anterior commissure rectimarginate; both anterior and lateral commissures located on acute edges. Ventral beak short, straight, directed posteriorly; minute palintrope orthocline, bounded by obscure edges; delthyrium ill-preserved. Surface smooth.

Interior: Ventral muscle field underlain anteriorly by a low pad of secondary material. Interior of brachial valve not examined.

Occurrence: Suchomasty Limestone, locality 12. Acanthopyge Limestone, old collections (probably locality 10).



20. *Karbous aperinus* Havlíček; transverse serial sections, ×5

Karbous Havlíček, 1985

Remarks: *Karbous,* based on *K. aperinus* Havl., is closely similar to *Peratos* Copper; the latter genus has medially directed spiralia, a feature indicating attribution to the *Glassiinae.* By contrast, *K. hassiacus* (Siehl) has dorsally directed spiral cones (Siehl, 1962); the same type of spiralia was mentioned by Havlíček (1985a) in *K. vaneki* (Zlíchov Fm., Bohemia). A closely similar species *"Cryptatrypa" lenticula* Perry (Delorme Fm., Zlíchovian; the Yukon) is distinguished by laterally directed spiral cones (Perry 1984, pl. 40, fig. 19).

Karbous aperinus Havlíček, 1985

Pl. XI, figs. 3—6; text-fig. 20

1985a *Karbous aperinus* sp. n.; Havlíček, p. 236, pl. 1, fig. 3; pl. 2, figs. 1, 2; text-figs. 2, 3.

Occurrence: Suchomasty Limestone, localities 3, 5.

Karbous truncatus Havlíček, 1985

Pl. XIII, figs. 1, 2

1985a *Karbous truncatus* sp. n.; Havlíček, p. 237, pl. 2, figs. 3, 4.

Occurrence: Suchomasty Limestone, localities 3, 5. Acanthopyge Limestone, locality 11.

Karbous hassiacus (Siehl, 1962)

Pl. XI, fig. 7

1962 *?Cryptatrypa hassiaca* n. sp.; Siehl, p. 198, pl. 27, figs. 5, 6; pl. 37, figs. 4, 6.

Occurrence: Acanthopyge Limestone, localities 2, 7, 10, 11. Rhineland, Greifenstein Limestone (upper Eifelian) (Siehl 1962).

Rhynchatrypa Siehl, 1962

Type species: *Terebratula thetis* Barrande, 1847.

Remarks: By its inner and outer morphology, the Silurian genus *Dubaria* Termier is so close to the Devonian *Rhynchatrypa* to leave no doubt that it is an ancestor of the latter genus. *Dubaria* has minute, narrowly triangular, coalescing deltidial plates rarely exposed for examination because of its incurved ventral beak; on the other hand, the deltidial plates of *Rhynchatrypa* are rather large, low and rather wide, medianly fusing into one piece with a clearly discernible suture, sur-

rounding the pedicle foramen (see pl. XII, fig. 6). By contrast to *Dubaria,* the ventral beak of *Rhynchatrypa* is nearly straight. Further, the hinge line of *Dubaria* remains curved till late adult growth stages, whereas that of *Rhynchatrypa* undergoes significant changes throughout ontogeny. It is curved in young specimens whereas it becomes straight in late adult shells; this modification is accompanied by appearance of small dorso-ventrally flattened ears (see pl. XII, fig. 4a, 4c) that have never been found in the Silurian *Dubaria.*

We are not sure if these differences between *Dubaria* and *Rhynchatrypa* are sufficient enough to warrant erection of two separate genera (or subgenera?); unfortunately, the lack of the Lochkovian, Pragian, and lower Zlíchovian septatrypids devoid of a dorsal mid-septum prohibits us to get to know the evolution of the *Dubaria - Rhynchatrypa* stock more precisely during the Lower Devonian.

Rhynchatrypa thetis (Barrande, 1847)

Pl. XII, figs. 1—4, 6

1847 *Terebratula Thetis* Barr.; Barrande, p. 394, pl. 14, figs. 5a—5f.
1879 *Atrypa Thetis* Barr.; Barrande, pl. 86, case IV, figs. 4, 5, 7—10; pl. 133, case I, figs. 6—8.
1962 *Rhynchatrypa thetis* (Barrande, 1847); Siehl, p. 200, pl. 28, figs. 1, 2; pl. 37, fig. 11; pl. 38, figs. 1, 2; text-figs. 23—26.
1986 *Rhynchatrypa jesenia* sp. n.; Havlíček - Pek, p. 20, pl. 2, figs. 1—8; text-fig. 3.

Lectotype (SD herein): Shell figured by Barrande in 1847, pl. 14, as figs. 5d—5e (non figs. 5a—c); refigured by Barrande in 1879 on pl. 86 as fig. IV-10; L 25898.

Type horizon and locality: Acanthopyge Limestone, Koněprusy.

Material: 60 shells from the Suchomasty and Acanthopyge Limestones; further numerous specimens in old collections.

Exterior: See Barrande, 1847 and Siehl, 1962.

Interior: See Siehl, 1962 (transverse sections).

Remarks: Size and outline of shell and size of the fold are rather variable; the different forms do not represent separate species because of gradual transitions among them. Also *R. jesenia,* erected by Havlíček and Pek (1986) (Chabičov Member, Eifelian; Moravia) should be considered a form of *R. thetis,* differring from the latter only in somewhat smaller size and less elevated fold.

The old collections include several large, strikingly transverse shells (pvL/W — 72—76 %) that have a narrow, highly elevated fold (pl. XII, fig. 4). It is probable that these specimens are to be treated as a separate species; their age, however, is not sure (Acanthopyge Limestone?).

Occurrence: Chýnice Limestone (upper part of the Zlíchovian); Bubovice, Čeřinka quarry. Suchomasty Limestone, localities 5, 12. Acanthopyge Limestone, localities 2, 6, 10, 11, Moravia; Horní Benešov in the Nízký Jeseník Mts., Chabičov Member (Eifelian) (Havlíček - Pek 1986). Rhineland, Greifenstein Limestone (upper Eifelian) (Siehl 1962). Gornyi Altai, Iakushinsk Beds, upper part of the Lower Devonian (Gracianova 1967).

Radimatrypa g. n.

Type species: *Radimatrypa zelaria* sp. n.

Diagnosis: Externally similar to *Septatrypa* Kozlowski but thick-walled, with a short median septum and small, open septalium in the brachial valve; dorsal median septum continuous with a strong ridge. Dental plates missing.

Comparison: Unlike the new genus, *Septatrypa* Kozlowski is thin-walled, has thin, moderately diverging dental plates, and its dorsal median septum is not continuous with a strong median ridge.

Radimatrypa zelaria sp. n.

Pl. XIII, figs. 3, 4; text-fig. 21

1879 *Atrypa Zelia* Barr.; Barrande (partim), pl. 90, case II, figs. 1—5.
1879 *Atrypa Thetis* Barr.; Barrande (partim), pl. 86, case IV, fig. 11.
1879 *Atrypa assula* Barr.; Barrande (partim), pl. 146, case I, fig. 2.

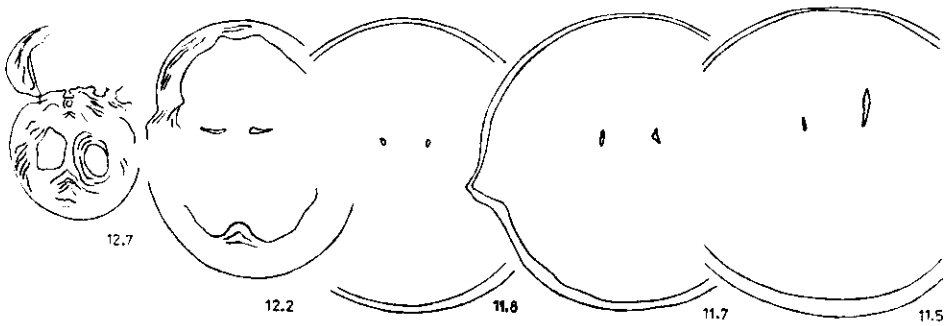
Holotype: Shell figured by Barrande in 1879 on pl. 90, case II, as fig. 2; refigured herein on pl. 13 as fig. 4; L 25939.
Type horizon and locality: Acanthopyge Limestone, Koněprusy.
Material: 14 shells.

Exterior: Shell lenticular in early growth stages, about 35 % as high as wide, with a very weak sulcus in the pedicle valve and slightly curved anterior margin. Shell of adult specimens pentagonal in outline, 17.0—22.5 mm wide (the largest shell 26.7 mm wide), and 48.0—58.3 % as high as maximum width. Hinge line always curved, ventral interarea very small, bordered by rounded edges; in adults, delthyrium not exposed for examination as the ventral beak nearly touches the beak of the opposite valve.

Pedicle valve 75—90 % as long as wide, evenly convex in posterior part; ventral sulcus appears at about the mid-length and extends into a trapezoidal tongue directed antero-dorsally to dorsally. At about two thirds of the valve length, the sulcus occupies 3/4 or 4/5 of the maximum width of the shell. Bottom of sulcus gently concave to almost flat, in

some specimens with a weak median groove. Shoulder angle about 120°.

Brachial valve strongly and evenly convex in its posterior part; anterior to mid-length, a low fold appears; its top is flat or slightly concave, sometimes bearing a median, very shallow groove. Surface smooth; no growth lines observed.



21. *Radimatrypa zelaria* sp. n.; transverse serial sections, ×5

Interior: See text-fig. 21.

Comparison: Barrande (1879) assigned to his *Atrypa zelia* shells of various ages; Plodowski (1971) selected as the lectotype a Wenlockian shell which clearly differs from the Dalejan-Eifelian specimens in having well-developed dental plates and lacking a thick layer of fibrous material in umbonal regions of both valves and on sides of the dorsal median septum.

Occurrence: Suchomasty Limestone, localities 3, 5. Acanthopyge Limestone, old collections.

Cerberatrypa g. n.

Type species: *Cerberatrypa cerberus* sp. n.

Diagnosis: Shell smooth, cordate to pentagonal in outline, equally biconvex, with curved hinge line in all growth stages; ventral sulcus narrow and rather deep; brachial valve either evenly convex or medianly sulcate; dorsal fold always absent, anterior commissure rectimarginate to uniplicate. Ventral beak nearly straight; palintrope small, apsacline to orthocline, coalescing deltidial plates present.

Dental plates short, lateral umbonal cavities free of secondary accumulations. Hinge plates disjunct, horizontally disposed or moderately incurved dorso-medianly. Median septum or ridge absent. Spiralia not discovered.

Comparison: *Cerberatrypa* may be considered as a terminal link of the *Dubaria* stock sharing with *Dubaria* s.s. the smooth shell, presence of short dental plates, absence of a median septum and septalium, and presence of disjunct hinge plates, but it differs from the latter in having a heart-shaped to pentagonal shape of the shell devoid of a prominent, dorsally directed tongue, and in lacking any sign of a dorsal fold.

The co-eval *Rhynchatrypa* Siehl differs from *Cerberatrypa* in having a *Dubaria*-shaped shell with a prominent tongue in adult specimens, and in developing a straight hinge line during ontogeny.

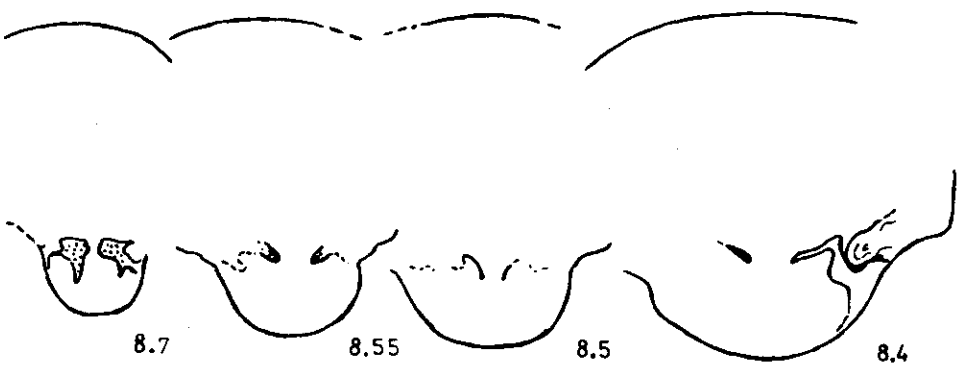
Cerberatrypa cerberus sp. n.

Pl. X, fig. 6; text-fig. 22

Holotype: Shell figured on pl. X as fig. 6; VH 4165f.
Type horizon and locality: Acanthopyge Limestone, locality 11.
Material: 9 shells.

Exterior: Shell heart-shaped in outline, 8.0—12.0 mm wide, equally biconvex, 49.3—56.4 % as high as maximum width; widest part between the mid-length and two thirds of the shell length. Pedicle valve 87.0—89.0 % as long as wide; postero-lateral sides rather long, straight or slightly curved toward mid-line; shoulder angle 103—113°. Anterior margin straight in young shells becoming emarginate in late adults. Anterior commissure rectimarginate to gently curved dorsally.

Pedicle valve moderately and evenly convex in lateral profile; ventral beak small, gently incurved, terminating with a sharp apex directed posteriorly to postero-dorsally; palintrope low, apsacline, concave, bordered by obtuse to rounded edges; deltidial plates present, but ill-preserved in all specimens examined. Brachial valve more convex umbonally than anteriorly. Both the pedicle and brachial valves bear a rounded



22. *Cerberatrypa cerberus* sp. n.; transverse serial sections, ×12

sulcus that originates near the beak and gradually expands forwards to become moderately broad and moderately deep in anterior part of the shell. Surface smooth, no growth lines observed.

Interior: See text-fig. 22.

Comparison: *C. cerberus* has a cordate, bisulcate shell, whereas *C. dissidens* bears a narrow, rather deep sulcus only in its pedicle valve; its brachial valve is evenly convex, without any sign of a fold or sulcus. Further, the shell of *C. cerberus* is more transverse than that of *C. dissidens*; its pvL/W ranges from 87.0 to 89.0 % whereas *C. dissidens* is always over 90 % as long as wide.

Occurrence: Acanthopyge Limestone, locality 11 (topmost part of the formation).

Cerberatrypa dissidens (Barrande, 1879)

Pl. X, fig. 7; text-fig. 23

1879 *Atrypa dissidens* Barr. Var. de *canaliculata* Barr.; Barrande, pl. 146, case I, fig. 2 (non fig. 1).

Lectotype (SD herein): Shell figured by Barrande in 1879 on pl. 146, case I, fig. 2; L 24954.

Type horizon and locality: Acanthopyge Limestone, Koněprusy.

Material: 46 shells.

Exterior: Shell equally biconvex, heart-shaped to subpentagonal in outline, with a straight or gently emarginate anterior margin, usually 7—10 mm wide (extremes: 4.6 and 11.8 mm wide), and 51.1—69.3 % as high as maximum width. Pedicle valve slightly wider than long, exceptionally elongate, 90.6—100.0 % as long as wide (extreme: 108.1 %); in lateral profile evenly convex with a moderately curved beak extending into a posteriorly to postero-dorsally directed apex. Ventral interarea small, gently concave, apsacline, bounded by obtuse edges; deltidial plates broadly triangular, pedicle foramen not found (due to a poor preservation). Postero-lateral sides of pedicle valve rather long, straight, enclosing 91°—98°. Ventral sulcus originates just in front of the beak as a narrow groove that broadens forward to give rise to a moderately deep sulcus with a rounded bottom; tongue absent.

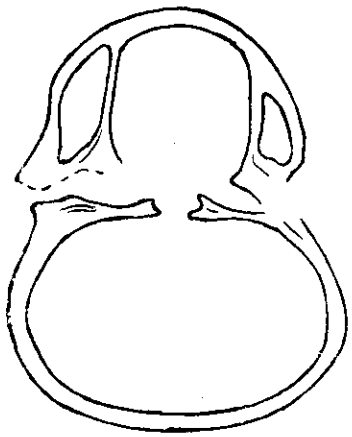
Brachial valve more convex umbonally than anteriorly, with a strongly swollen beak. Fold absent; a few specimens bear a weak median flattening that never changes into a true sulcus. Surface smooth.

Interior: See text-fig. 23.

Remarks: The specimens collected from the Suchomasty Limestone differ from the Acanthopyge-limestone population in having much shallower ventral sulcus. We are not sure if the weak sulcus is a constant

feature in specimens from the Suchomasty Limestone, because our collection contains only 3 shells. For this reason we retain all the heart-shaped shells lacking a dorsal sulcus within the species rank of *C. dissidens*.

Occurrence: Suchomasty Limestone, locality 5. Acanthopyge Limestone, Konèprusy (old collections).



23. *Cerberatrypa dissidens* (Barrande); transverse section, ×12

Punctatrypidae Ržonsnickaja, 1960

Fossatrypa Mizens & Ržonsnickaja, 1979

Fossatrypa granulifera (Barrande, 1847)

Pl. XII, figs. 8, 10

1987 *Fossatrypa granulifera* (Barrande, 1847); Havlíček, p. 89, pl. 13, figs. 1—5.

Occurrence: Suchamosty Limestone, localities 3, 5, 8. Rhineland, Greifenstein Limestone (Eifelian) (Siehl 1962).

Carinatinidae Ržonsnickaja, 1960

Carinatina Nalivkin, 1930

Carinatina arimaspus (Eichwald, 1840)

Pl. XVII, fig. 9; pl. XXIII, fig. 4

1975 *Carinatina arimaspus* (Eichwald, 1840); Ržonsnickaja, p. 139, pl. 31, figs. 1—3, 12; text-fig. 45.

1987 *Carinatina arimaspus* (Eichwald, 1840); Havlíček, p. 93, pl. 11, figs. 7—9.

Occurrence: Suchomasty Limestone, locality 5. Ural Mts., Central Asia, Salair Mts.; upper Zlíchovian to lower Eifelian (Ržonsnickaja 1975).

Carinatina sp.

1987 *Carinatina* sp.; Havlíček, p. 94, pl. 14, fig. 1.

Occurrence: Acanthopyge Limestone, locality 7.

Hergetatrypa Havlíček, 1987

Hergetatrypa minuta (Siehl, 1962)

Pl. XVII, figs. 1—3

1962 *Carinatina minuta* n. sp.; Siehl, p. 188, pl. 24, figs. 2, 3; pl. 38, figs. 5—7.
1987 *Hergetatrypa minuta* (Siehl, 1962); Havlíček, p. 98, pl. 14, figs. 4—6.

Occurrence: Suchomasty Limestone, localities 3, 5. Rhineland, Greifenstein Limestone (Eifelian) (Siehl 1962).

Davidsoniatrypidae Havlíček, 1987

Kaplicona Havlíček, 1987

Kaplicona fragilis (Barrande, 1879)

Pl. IV, fig. 10

1967 *Biconostrophia fragilis* (Barrande, 1879); Havlíček, p. 211, pl. 48, figs. 11, 12.

Occurrence: Suchomasty Limestone, locality 3.

Davidsoniidae King, 1850

Quasidavidsonia Havlíček, 1987

Quasidavidsonia mediocarinata (Havlíček, 1967)

Pl. III, figs. 11—15

1967 *Prodavidsonia mediocarinata* sp. n.; Havlíček, p. 215, pl. 49, figs. 10—14.

Occurrence: Acanthopyge Limestone, localities 2, 7, 10, 11.

Quasidavidsonia tenuissima (Barrande, 1879)

Pl. III, figs. 9, 10

1967 *Prodavidsonia tenuissima* (Barrande, 1879); Havlíček, p. 214, pl. 49, figs. 15—20.

Occurrence: Suchomasty Limestone, localities 3, 5.

Retziacea Waagen, 1883

Retziidae Waagen, 1883

Plectospira Cooper, 1942

Remarks: In Czechoslovakia, *Plectospira* is widely distributed; the lineage of strongly costate species begins with *P. membranifera* (Barr.) in the Pragian (Koněprusy Limestone; see Barrande 1879, pl. 34, figs. 7—9; non fig. 6 = *Spirigerina* sp.), continues with *P. oronia* nom. n. in the Zlíchovian, and terminates with *P. ferita* (Buch) in the Givetian (Čelechovice Beds, Moravia). The shells collected from the Suchomasty Limestone (Dalejan) differ from the main lineage in that the ribbing tends to be weak or even obscure, most probably due to a very shallow-water environment. *P. dione* still has rounded ribs but always less strong than those of the main plectospirid stock. Even much weaker ribbing was found in *P. leniplicata* whose costae tend to disappear forward.

Plectospira dione sp. n.

Pl. XV, figs. 2, 3; text-fig. 24

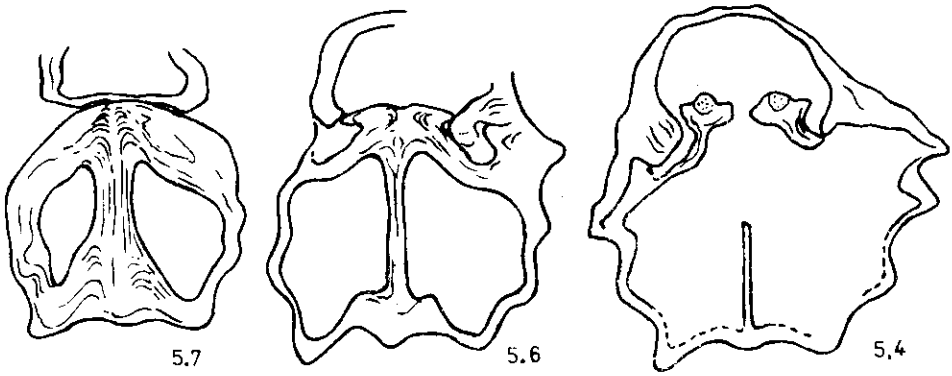
Holotype: Shell figured on pl. XV as fig. 3; VH 2625d.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 20 shells.

Exterior: Shell subequally biconvex, elongate; the youngest specimen available 3.2 mm wide and 5.0 mm long, with a narrow and straight beak. Adult specimens 7.0—9.0 mm wide, and 57.6—74.3 % as high as maximum width. Pedicle valve 108—122 % as long as wide, drop-shaped in outline, in lateral profile gently convex, usually more curved anteriorly than in the mid-length. Beak narrow, straight; delthyrium covered by a triangular plate; pedicle foramen not examined due to a less favourable preservation. Ventral sulcus as broad as intercostal interspaces.

Brachial valve moderately and almost evenly convex in lateral profile; mid-rib in brachial valve more slender than the other ribs, usually slightly expanding forward to reach the front margin of the valve as a narrow ridge; in some specimens, however, it passes into a very low but rather broad plication just at front of the valve.

Pedicle valve bears 2 pairs of strong, rounded ribs increasing in size toward front margin. The third pair, if present, is very weak. Each flank of brachial valve bears 2 ribs. The ribs are straight umbonally but clearly deflected antero-laterally near front margin of the shell.

Interior: See text-fig. 24.



24. *Plectospira dione* sp. n.; transverse serial sections, ×12

Comparison: By contrast to *P. dione,* the Eifelian species *P. varioplicata* Siehl (Greinfenstein Limestone, Rhineland; Siehl 1962) has 3 pairs of ribs on its brachial valve; further, the dorsal umbonal cavity is much more reduced by secondary shell material in *P. varioplicata* than in the Bohemian species; for this reason, the median septum is thin and high in *P. dione,* whereas that of *P. varioplicata* (at least its posterior part) is greatly obscured by the secondary deposits (see Siehl 1962, pl. 35, fig. 2).

Occurrence: Suchomasty Limestone, localities 5, 8.

Plectospira varioplicata Siehl, 1962

Pl. XVII, fig. 7

Occurrence: Acanthopyge Limestone, small quarry north of the locality 10 (only one shell available). Rhineland, Greifenstein Limestone (Eifelian) (Siehl 1962).

Plectospira grochonia sp. n.

Pl. XV, fig. 1; pl. XVI, fig. 1

Holotype: Shell figured on pl. XV, as fig. 1; VH 2528a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 6 shells.

Exterior: Externally recalling *P. varioplicata* but smaller, subcircular in outline, with a short ventral beak gently extending beyond the hinge line. Ribs strong, rounded, 4 (exceptionally 6) in the pedicle valve, and 5 in the brachial valve. Height of ribs increases more rapidly at anterior margin than in the middle part of the shell. For this reason, anterior margin of each rib is recurved ventrally in the pedicle valve,

and correspondingly dorsally in the brachial valve, thus simulating the rib-pattern of *P. oronia* and *P. ferita* (Buch).

Interior: Not investigated.

Comparison: *P. grochonia* may be derived from the earlier *P. oronia* (Zlíchov Limestone, Bohemia); it shares with the latter the typical shape of the ribs, but it differs in having rounded costae even just at the anterior commissure, whereas the commissure of *P. oronia* is deeply indented owing to very high, in cross-section subangular ribs in proximity of the front margin of the shell. Further, the ventral beak of *P. grochonia* is shorter than that of *P. oronia*.

Occurrence: Suchomasty Limestone, locality 5.

Plectospira oronia nom. n.

1956 *Plectospira sexplicata* sp. n.; Havlíček, p. 617, pl. 4, figs. 18—22.

Exterior and interior: See Havlíček 1956.

Remarks: Name of *P. sexplicata* Havlíček is pre occupied by *P. sexplicata* (White & Whitfield, 1862); for this reason, a new name *P. oronia* is suggested here for the Bohemian species.

Occurrence: Zlíchov Limestone, Praha - Hlubočepy.

Plectospira leniplicata sp. n.

Pl. XIV, figs. 1—4; text-fig. 25

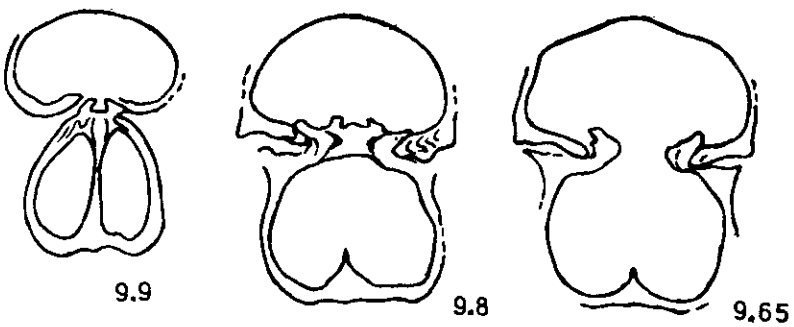
Holotype: Shell figured on pl. XIV as fig. 1; VH 2624a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 61 shells.

Exterior: Shell subquadrate in outline, dorsi-biconvex, 10.0—13.0 mm wide in adults and 48.2—58.0 % as high as maximum width. Pedicle valve gently convex in lateral profile, 92—111 % as long as its maximum width, with a narrow, straight beak terminating with a sharp apex directed posteriorly. Delthyrium covered by a flat to slightly concave plate, pedicle foramen not seen (probably small). Ventral sulcus about as broad as the intercostal interspaces, very shallow, less commonly obscure.

Brachial valve more curved umbonally than anteriorly, subcircular in outline. Ribbing variable; in pedicle valve, 2 (rarely 3) pairs of plications originate near the posterior margin as low, rounded ridges separated by very shallow interspaces. The plications often reach the front of the shell, less commonly they are weak umbonally and disappear before reaching front of the valve. In the brachial valve, 5 rounded ribs start at the posterior margin; the mid-rib is the most slender of them. All ribs

often become obscure before reaching the mid-length of the brachial valve, less commonly they keep the shape of low, rounded ridges even in the anterior part of the valve except for the mid-rib which in all specimens available tends to disappear forward. An exceptional shell is devoid of ribbing in its brachial valve, but it has hardly discernible 4 plications in its pedicle valve (see pl. 14, fig. 4).

Interior: See text-fig. 25 (shell thin-walled).



25. *Plectospira leniplicata* sp. n.; transverse serial sections, ×12

Comparison: In *P. leniplicata,* the ribs tend to be weak or even obscure in the anterior part of the shell, whereas those of *P. varioplicata* are formed as rounded ridges over the whole surface of both valves. The median rib is well-developed even in the anterior part of the brachial valve in *P. varioplicata,* whereas it is obscure (sometimes missing altogether) near the anterior margin of *P. leniplicata.* A few specimens of *P. leniplicata* bear low, rounded ribs even in the anterior part of the shell except for the mid-rib which is anteriorly always obscure or even indistinct; on the other hand, the dorsal mid-rib in *P. varioplicata* is always formed as a rounded ridge both umbonally and anteriorly. Further, *P. varioplicata* is more elongate than *P. leniplicata.*

Occurrence: Suchomasty Limestone, locality 5.

Athyridacea M'Coy, 1844

Athyrididae M'Coy, 1844

Leptathyris Siehl, 1962

Leptathyris deino sp. n.

Pl. XIV, figs. 5, 6; text-fig. 26

Confer: 1962 *Leptathyris* n. sp. A; Siehl, p. 214, pl. 36, fig. 3; pl. 39, fig. 4.

Holotype: Shell figured on pl. XIV as fig. 6; VH 2640.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 36 shells.

Exterior: Shell equally biconvex, 9.5—15.3 mm wide in adult specimens, subcircular to heart-shaped in outline, 52—60 % as high as maximum width, exceptionally even thicker. Pedicle valve usually slightly wider than long, rarely slightly elongate, 91.0—104.5 % as long as its maximum width. In lateral profile, pedicle valve evenly convex, with a moderately curved short beak terminating with a sharp apex directed postero-dorsally. Palintrope small, apsacline, in specimens from the Acanthopyge Limestone bounded by obtuse edges, in specimens from the Suchomasty Limestone not clearly defined. Delthyrium partly restricted by small deltidial plates. Pedicle valve usually depressed near the anterior margin, rarely bearing a shallow sulcus; anterior commissure rectimarginate; shoulder angle 95—100°.

Brachial valve more convex umbonally than anteriorly devoid of a fold, exceptionally bearing a median flattening as does the pedicle valve. Surface smooth, no growth lines observed.

Interior: See text-fig. 26.

Comparison: *L. gryphis* Siehl (Greifenstein Limestone, Eifelian, Rhineland) is closely related to the Bohemian species; it is distinguished by the common presence of a shallow sulcus in each valve, whereas *L. deino* bears rarely a sulcus in its pedicle valve, and its brachial valve is unsulcate (exceptionally displaying a median flattening). Further, the ventral beak of *L. deino* is longer than that of *L. gryphis*.

L. sp. A (Greifenstein Limestone, Rhineland; Siehl 1962) is very close to *L. deino* except for having a weakly uniplicate anterior commissure.

Occurrence: Suchomasty Limestone, locality 5. Acanthopyge Limestone, localities 7, 10, 11.

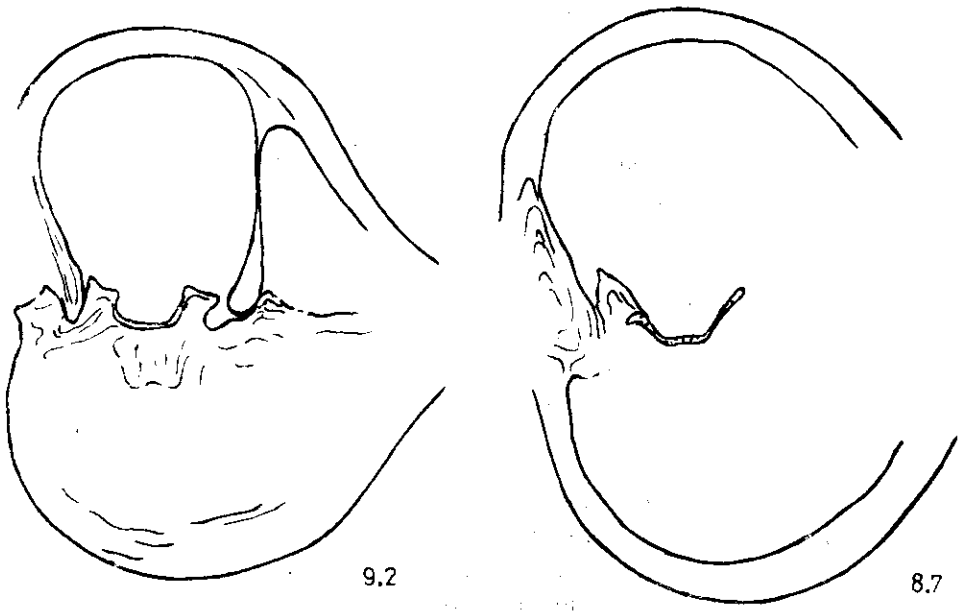
Athyris M'Coy, 1844

Athyris odolens sp. n.

Pl. XIII, figs. 5, 6; text-fig. 27

Holotype: Shell figured on pl. XIII as fig. 5; VH 4161b.
Type horizon and locality: Suchomasty Limestone, licality 8.
Material: 18 shells.

Exterior: Shell transversely elliptical, 14.0—21.6 mm wide, equally biconvex, 51.0—60.0 % as high as maximum width. Pedicle valve evenly convex in lateral profile, 84—97 % as long as wide, with a shallow

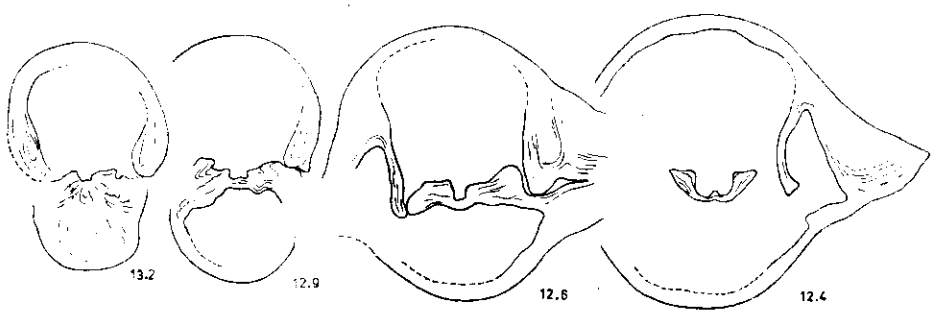


26. *Leptathyris deino* sp. n.; transverse sections, ×12

groove that widens anteriorly to form a subangular sulcus occupying over 2/5 of the maximum width of the shell (but less than half-width); anterior commissure uniplicate; ventral beak short, incurved, deltidial plates and pedicle foramen not exposed.

Brachial valve 72.5—90.1 % as long as wide, widest at about its mid-length; sides evenly rounded, hinge margin gently arcuate; dorsal beak small, moderately swollen; fold absent or formed as a weak elevation hardly distinguishable from the convex flanks; median groove in brachial valve, if at all present, very shallow.

Ribs absent; concentric lamellae coarse, usually 2 per 3 mm.



27. *Athyris odelens* sp. n.; transverse serial sections, ×5

Interior: See text-fig. 27. Ventral muscle field weakly impressed, bisected by a myophragm.

Comparison: *A. ceres* (Barr.) (Koněprusy Limestone, Pragian) differs from *A. odolens* in having finer concentric lamellae counting 8—9 per 3 mm, deeper subangular sulcus originating near the beak, higher tongue, and a subcarinate brachial valve, whereas the brachial valve of *A. odolens* is evenly curved in its median sector.

Occurrence: Suchomasty Limestone, localities 3, 8.

Meristellacea Waagen, 1883

Meristellidae Waagen, 1883

Merista Suess, 1851

Merista repellens sp. n.

Pl. XV, figs. 4—6; text-fig. 28

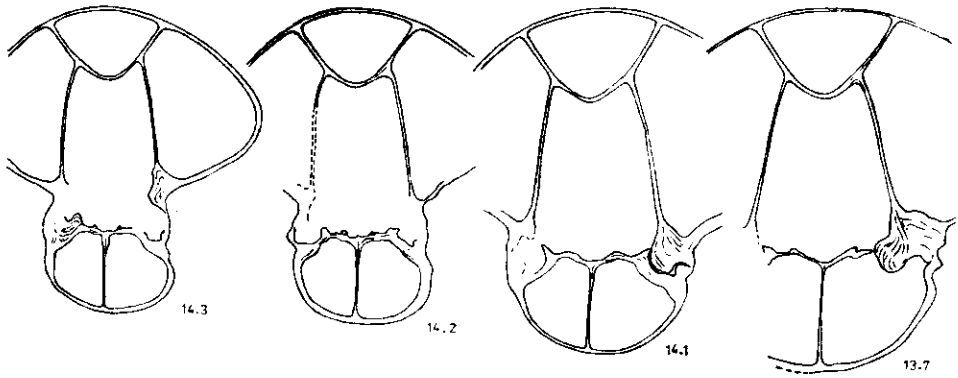
1879 *Merista passer* Barr.; Barrande (partim), pl. 14, case I, figs. 14, 16.

Holotype: Shell figured on pl. XV as fig. 5; VH 4828c.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 80 shells.

Exterior: Young shells (smaller than 13.0 mm) subquadrate in outline, moderately wider than long, widest at about mid-length, lenticular both in transverse and longitudinal profiles, lacking fold and sulcus, with a rectimarginate to gently arcuate anterior commissure; thickness equals to half-width (or even less) of the shell.

Adult specimens subequally biconvex to dorsi-biconvex (depending on size of the fold), 18.0—25.6 mm wide, usually slightly wider than long, 56—60 % as high as maximum width; in a few gerontic specimens, shT/W: 70.0—76.0 %. Pedicle valve evenly convex in longitudinal profile, less commonly more convex posteriorly than anteriorly, subquadrate to subpentagonal in outline, usually 95—101 % as long as its widest part; postero-lateral margins long, nearly straight, enclosing an obtuse angle (95—108°). Ventral beak short, incurved, with apex directed dorsally. Palintrope not clearly separated from the rest of the valve surface. Sulcus confined to anterior part of the pedicle valve, usually shallow, not clearly differentiated, extending into a low to high (depending on age of the specimen), rounded, rarely trapezoidal tongue. Most of delthyrium covered by the beak of the opposite valve.

Dorsal beak moderately swollen; fold occupies anterior part of the valve; in side view, its top is flat or gently raised dorsally just at front of the valve. Surface smooth, devoid of growth lines.



28. *Merista repellens* sp. n.; transverse serial sections, ×5

Interior: See text-fig. 28.

Comparison: Two *Merista* species are abundant in the Suchomasty Limestone, namely *M. passer* and *M. repellens*; the former is derived from a small, elongate, not yet described species of the Pragian age, the latter one is a probable descendant of *M. herculea,* an index species in the Pragian. Young shells of *M. passer* and *M. repellens* are easy to distinguish; *M. repellens* includes subquadrate shells lenticular both in lateral and transverse profiles, wider than long, whereas the shells of young *M. passer* are elongate-elliptical, in posterior view clearly more convex than those of *M. repellens.*

When examining adult specimens, we can easily separate in most cases the elongate *"passer"* forms from the transverse *"repellens"* forms. The length/width ratio, however, proved to be not quite reliable, because several late adult shells of *M. passer* are slightly wider than long, and vice versa, several shells of *M. repellens* are slightly elongate. As auxilliary features for distinguishing the two species may serve the shape of the dorsal beak which in *M. passer* is usually more inflated than in *M. repellens,* and the form of the tongue, which in *M. passer* is trapezoidal, that of *M. repellens* rounded. Unfortunately, some shells remained undetermined, because the shapes of their tongues and dorsal beaks did not fully correspond to those of the "typical forms" of the species under discussion.

In many aspects, *M. herculea* (Barr.) is closely similar to *M. repellens,* but it is much larger (35—47 mm wide in adult specimens), and the postero-lateral sides of its pedicle valve are commonly curved (not straight as in *M. repellens*).

M. turgens Siehl (Greifenstein Limestone, Rhineland; Siehl 1962) recalls the new species; its shell, however, has shorter and less incurved beak, is moderately larger (21.0—34.5 mm), and more trans-

verse (pvL/W: 70—86 %) than that of *M. repellens*. Further, the shoulder angle of *M. turgens* is usually 103—130°, that of *M. repellens* 95—108°.

Occurrence: Suchomasty Limestone, localities 3, 5, 8. Acanthopyge Limestone, locality 6.

Merista passer (Barrande, 1847)

Pl. XVI, figs. 2—5

1847 *Terebratula Passer* Barr.; Barrande, p. 381, pl. 16, fig. 2.
1879 *Merista passer* Barr.; Barrande, pl. 14, case I, figs. 8—11, 13.
1962 *Merista passer* (Barrande); Siehl, pl. 29, figs. 6—8.

Holotype (by monotypy): Shell figured by Barrande in 1847; refigured by Barrande in 1879 (pl. 14, case I, fig. 10) and herein on pl. XVI as fig. 4; L 25287.
Type horizon and locality: Suchomasty Limestone, Koněprusy.
Material: about 100 shells.

Exterior: Young shells elongate-oval, without fold and sulcus, rather strongly convex in posterior view, 65—75 % as high as maximum width, with a gently arcuate anterior commissure. Adult shells 12.0—17.2 mm wide, usually elongate, less commonly slightly wider than long, and 60.5—80.3 % as high as maximum width.

Pedicle valve 95—120 % as long as wide, almost evenly convex in lateral profile, with a strong, incurved beak. Postero-lateral sides usually enclose an acute angle, rarely a right angle (70—90°). Ventral sulcus well-defined in late adult specimens as a shallow and broad depression with a flat bottom, less commonly the sulcus is missing even in late adult shells (e.g. in the holotype). Tongue trapezoidal, low to high, dorsally directed.

Beak of brachial valve inflated; fold short, just at its front deflected dorsally. Surface either smooth or a few step-like growth imbrications present.

Interior: See Siehl, 1962, pl. 29, figs. 6—8 (transverse sections).

Occurrence: Suchomasty Limestone, localities 3, 5, 8, 12.

Cyrtiacea Frederiks, 1919

Cyrtiidae Frederiks, 1919

Cyrtiinae Frederiks, 1919

Rochtex g. n.

Type species: *Rochtex lissopleura* sp. n.

Diagnosis: Shell cyrtiid in appearance with hemipyramidal pedicle valve much higher than the nearly planar brachial valve; ventral

interarea flat to slightly concave below the apex, catacline to slightly procline; pseudodeltidium convex, unperforated, covering the whole delthyrium to leave no place for passage of the pedicle. Dorsal interarea low, orthocline to apsacline. Ventral sulcus shallow, smooth, exceptionally bearing one (maximum two) very weak plications. Dorsal fold low, rounded, sometimes with a flattened top. Flanks costate; costae rounded, usually 3—4 pairs, mostly simple, rarely one of them may bifurcate. Surface devoid of both the radial and concentric striations; if the shell is partly exfoliated, the radially disposed fibres appear.

Dental plates short, slightly diverging anteriorly, intrasinal. Crural plates fine, never resting on the valve floor; cardinal process not found.

Comparison: By its overall shape of shell, *Rochtex* is closely similar to the Silurian genus *Plicocyrtia* Boucot, but it differs from the latter in lacking the radial capillae on shell surface and in having free crural plates and a pseudodeltidium not pierced by the pedicle foramen at least in adult specimens. In spite of the absence of radial striation, we may assign *Rochtex* to the cyrtiid stock as indicated by such significant features as are the cyrtiid shape of shell, very high and nearly flat ventral interarea, high pseudodeltidium, and divergent dental plates.

Rochtex is probably derived from *Callispirifer* Perry (upper part the Delorme Fm., Yukon, Canada; Perry 1984) differing from the latter in loss of microornament and presence of a large pseudodeltidium that covers the whole deltidium. By contrast, *Callispirifer* has growth lines which become forwardly imbricate. Further, pseudodeltidium of *Callispirifer* is usually small, apical; rarely, in some small shells, it occupies a rather large proportion of the delthyrium to leave only a small pedicle opening. Further, the ribs of *Callispirifer* are much stronger than the low plications of *Rochtex*.

Rochtex lissopleura sp. n.

Pl. XX, figs. 1, 2, 5

Holotype: Shell figured on pl. XX as fig. 5; VH 4783.
Type horizon and locality: Suchomasty Limestone, locality 2.
Material: 11 shells and several fragments.

Exterior and interior: See diagnosis of the genus. Dimensions: shW: 15.8—27.2 mm; bvL/W: 52.2—64.5 %; shT/W: 57.0—67.4 %; SuW/shW: 31.6—35.3 %.

Occurrence: Suchomasty Limestone, localities 2, 5, 12. Acanthopyge Limestone, locality 7 (only 2 shells).

Eospiriferinae Schuchert & LeVene, 1929

Myriospirifer Havlíček, 1978

Myriospirifer insidiosus (Barrande, 1879)

1980 *Myriospirifer insidiosus* (Barrande, 1879); Havlíček, p. 39, pl. 10, figs. 1—4; pl. 11, fig. 1.

Occurrence: Suchomasty Limestone, locality 5.

Pinguispiriferinae Havlíček, 1971

Pinguispirifer Havlíček, 1957

Pinguispirifer fessus sp. n.

Pl. XX, figs. 3, 4, 6, 9; text-fig. 29

1971 *Pinguispirifer infirmus* (Barr.); Havlíček, pl. 5, fig. 3.

Holotype: Shell figured on pl. XX as fig. 6; VH 2195a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: about 50 shells.

Interior: Shell 20—24 mm wide in adults, about 67 % as high as maximum width (extremes: 62 and 78 %); early growth stages lenticular in side view, less high than half-width of the shell. Pedicle valve somewhat higher than the brachial valve, about 76.3 % as long as wide (extremes: 69 and 86 %; one exceptional valve: 66 % as long as wide), widest at mid-length; ventral interarea deeply concave, occupying more than 2/3 of the shell-width, separated by edges from the rest of the valve; lower part of the interarea catacline to slightly procline, delthyrium restricted by narrow deltidial plates; ventral beak small, terminating with a sharp apex directed posteriorly. Sulcus shallow, occupying about half-width of the shell, anteriorly extending into a short, arcuate tongue. Flanks of pedicle valve evenly convex, smooth.

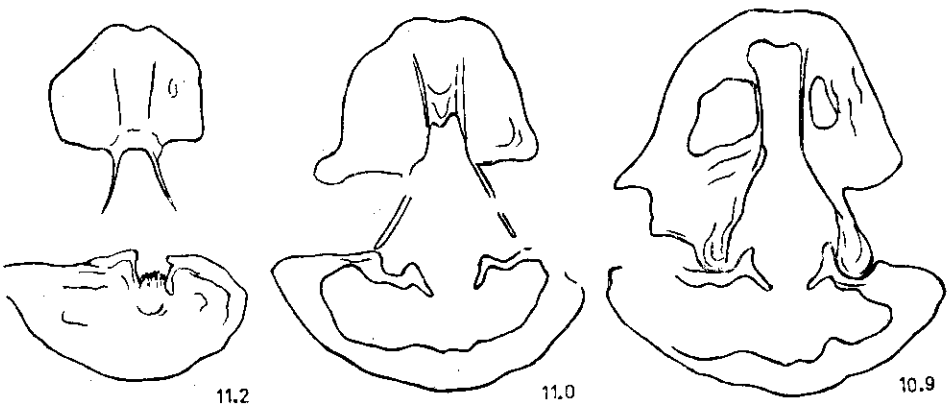
Brachial valve about 73.0 % as long as wide (extremes: 68 and 77 %); cardinal angles obtuse; fold low, rounded, separated by shallow grooves from the gently convex flanks; ribs either absent or a pair of very weak undulations developed in about 4 % of the Herget-quarry population. Dorsal interarea anacline.

Microornamentation usually worn away; if present, it is confined to the uppermost layer of the shell and consists of fine radial capillae (about 8 per 1 mm); spines absent.

Interior: Pedicle valve thick-shelled umbonally; very short dental plates obscured by the secondary shell material in the same way as in *P.*

infirmus. Ventral muscle field minute, elongate, deeply inserted in the shell.

Crural plates do not rest on the valve floor; diductor attachment radially striated. Dorsal muscle field bounded postero-laterally by strong ridges; its anterior margin obscure.



29. *Pinguispirifer fessus* sp. n.; transverse serial sections, ×8

Comparison: *P. fessus* is easily distinguishable from *P. infirmus* by lack of radial ribs on both valves, exceptionally bearing a pair of very weak undulations on its brachial valve. By contrast, *P. infirmus* has 2 to 4 pairs of low radial ribs, the outer pair of which tends to be obscure. Further, the fold is flat-topped in *P. infirmus* and its tongue is trapezoidal, whereas *P. fessus* has a low, rounded fold and an acruate tongue.

Occurrence: Suchomasty Limestone, localities 5, 8, 12.

Pinguispirifer infirmus (Barrande, 1879)

Pl. XIX, fig. 6

1959 *Pinguispirifer infirmus* (Barrande, 1879); Havlíček, p. 81, pl. 17, figs. 5—7, 10, 11; text-figs. 32—36.

1962 *Pinguispirifer infirmus* (Barrande, 1879); Boucot, text-figs. 1, 2.

Exterior and interior: See Havlíček 1959. Dimensions: shW: 20.0—28.0 mm in adults; shT/shW: about 57 % (extremes: 52 and 67 %); pvL/W: about 70.0 % (extremes: 66 and 77 %); bvL/W: about 67.5 % (extremes: 61 and 73 %); suW/shW: about 50.1 % (extremes: 43 and 57 %); width of interarea: 65—75 % of maximum width.

Sulcus and fold smooth, flanks bear 2—4 pairs of low, rounded ribs; the outer pair tends to be obscure. Top of the fold flattened, tongue trapezoidal.

Occurrence: Suchomasty Limestone, locality 3.

Amoenospirifer Havlíček, 1957

Amoenospirifer amoenoides Havlíček, 1959

Pl. XVIII, fig. 4

1959 *Amoenospirifer amoenoides* n. sp.; Havlíček, p. 110, pl. 21, figs. 1, 2.

Exterior: See Havlíček 1959. Dimensions: shW: 17.0—20.0 mm [7 specimens measured]; shT/shW: 70.6—81.0 %; pvL/W: 85.9—93.5 %; bvL/W: 63.4—76.4 %; suW/shW: 42.5—53.9 %; shT/bvL: 105.0—111.3 %. Pedicle valve strongly convex in lateral profile; cardinal angles rounded to obtuse; due to low, deeply concave interarea, distance between the ventral and dorsal beaks is less than 1 mm; bottom of a broad sulcus concave umbonally but nearly flat anteriorly; tongue rectangular to trapezoidal. Ribs usually in three pairs, rounded; the ribs bounding the sulcus rather strong, whereas the lateral costae are weak; the ribs of the third pair tend to be obscure. Microornamentation as in *A. thetidis*.

Interior: Not investigated.

Occurrence: Suchomasty Limestone, localities 4, 8 (rare). Acanthopyge Limestone, locality 7 (two shells available; both somewhat more transverse than the earlier population of the Suchomasty Limestone; the almost complete specimen VH-2478a is 82.2 % as long as wide, and 66.6 % as high as its maximum width).

Amoenospirifer oenone sp. n.

Pl. XVIII, figs. 6—8; pl. XXII, fig. 7

1879 *Spirifer Thetidis* Barr.; Barrande (partim), pl. 6, figs. 1, 5.

Holotype: Shell figured on pl. XVIII as fig. 8; VH 2389d.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 37 shells and several valves.

Exterior: Shell subcircular in early growth stages becoming much wider than long in late aduts. The youngest shell available is 7.5 mm wide, 6.9 mm long, 4.7 mm thick, and bears only 3 pairs of ribs on its pedicle valve. Adult specimens are 18.5—25.0 mm wide with the following features: pvL/W: about 72 % (extremes: 71 and 75 %); bvL/W: about 65 % (extremes: 62 and 70 %); shT/W: about 62 % (extremes: 59 and

64 %); shT/bvL: about 94 % (extremes: 91 and 101 %). Young specimens, smaller than 12 mm, are less transverse with brachial valves 70—74 % as long as wide; owing to strong ventral beak the pvL/W ranges from 87 to 92 % in young pedicle valves.

Pedicle valve strongly and evenly convex in side view, with a strong beak considerably surpassing the hinge line. Ventral interarea deeply concave, steeply apsacline to catacline, as wide as or slightly shorter than the maximum width of shell, bounded laterally by prominent edges, medianly with an open delthyrium. Ventral sulcus deep and concave umbonally but shallow anteriorly where its bottom is nearly flat; sulcus about 41 % as wide as the shell; tongue subrectangular.

Brachial valve moderately convex with its greatest curvature in umbonal region; cardinal angles rounded in young specimens but rectangular to acute in adults. Dorsal interarea orthocline to apsacline.

Ribs strong (stronger than in other species of *Amoenospirifer*), posteriorly narrow and angular, separated by deep angular interspaces; toward front margin, the ribs become roundedly angular to rounded; young specimens (smaller than 12 mm) bear 3—4 pairs of ribs, the late adult ones have 5—6 pairs of simple, never bifurcating ribs.

Fine ornamentation consists of concentric fila crossed by even finer radial capillae; some growth lines may extend into short concentric lamellae.

Interior: Umbonal regions of both valves thick-shalled; delthyrial cavity deep, minute, less wide than 10 % of the maximum width and less long than 25 % of the pedicle-valve length. Dental plates missing; vascula media more divergent than the ribs of the first pair. Genital markings (pitting) clearly developed laterally to the muscle field. Anterior parts of crural plates free; dorsal muscle field bounded posterolaterally by low ridges.

Comparison: The Herget quarry has yielded two easily discernible species of *Amoenospirifer,* namely *A. foedus* and *A. oenone*; the former species is distinguished by obtuse cardinal angles and weak plications tending to obscurity, whereas *A. oenone* bears strong, rounded to rounded-angular ribs and its cardinal angles are rectangular to acute in late adult specimens.

A. amoenoides differs from the new species in having a more convex and less wide shell, a clearly broader sulcus, less numerous ribs, and obtuse to rounded cardinal angles; unlike *A. oenone, A. amoenoides* is confined to the *Orbitoproetus-Scabriscutellum* Community.

A. thetidis has never been found in the Herget quarry; all specimens available come from old collections probably made in organodetrital limestones filling the neptunian dikes. *A. thetidis* differs from *A. oenone*

in having less high shells with shT/shW ratio ranging from 42 to 53.2 %, somewhat weaker radial pattern in which one or two ribs may bifurcate; further, the cardinal angles remain rounded through ontogeny in *A. thetidis*.

Occurrence: Suchomasty Limestone, localities 3 (mostly disarticulated), 5 (common, never disarticulated). Acanthopyge Limestone, locality 7 (one shell only).

Amoenospirifer thetidis (Barrande, 1848)

Pl. XVII, figs. 4, 5

1959 *Amoenospirifer thetidis* (Barrande, 1848); Havlíček, p. 106, pl. 21, figs 3, 4, 6, 7; text-fig. 49.

Exterior: See Havlíček 1959. Dimensions: shW: 20.0—25.0 mm (exceptionally 32.0 mm) in adult specimens; pvL/W: 53.0—57.1 %; bvL/W: 50.8—53.6 %; shT/W: 42.0—53.2 %; suW/shW: 36.1—55.7 %. Cardinal angles obtuse to rounded; in lateral profile, ventral umbonal region more curved than the anterior part of the valve; ventral sulcus narrow umbonally but rapidly expanding toward front margin; consequently, the ribs bounding the sulcus are usually curved antero-laterally (not straight as in *A. oenone*). Flanks bear 4—5 (rarely 6) pairs of rounded ribs; in some specimens, the ribs of the first or second pair may bifurcate either on one or both sides of the valve, or a low rib may intercalate between the costae of the first and second pairs.

Interior: See Havlíček 1959.

Occurrence: Suchomasty Limestone, old collections.

Amoenospirifer foedus sp. n.

Pl. XVIII, figs. 1—3

Holotype: Shell figured on pl. XVIII as fig. 3; VH 2392a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 12 shells.

Exterior: By its size and shape closely similar to *A. thetidis* but differing from the latter in having very weak plications that in some specimens tend to obscurity; cardinal angles obtuse to rectangular. Dimensions of the holotype: shW: 28.9 mm; pvL: 15.7 mm; shT: 14.8 mm; suW: 12.2 mm.

Interior not investigated.

Occurrence: Suchomasty Limestone, locality 5.

Spiriferacea King, 1846

Delthyrididae Waagen, 1883

Quadrithyris Havlíček, 1957

Quadrithyris sobrina sp. n.

Pl. XIX, fig. 4

Holotype: Shell figured on pl. XIX as fig. 4; VH 2417.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 2 shells and several incomplete specimens.

Exterior: Closely similar to *Q. robusta* except for having a very shallow sulcus and a thick-shelled umbonal part of the pedicle valve. Dimensions of the holotype: shW: 22.0 mm; pvL: 17.1 mm; bvL: 16.4 mm; shT: 13.6 mm.

Interior: High median septum and dental plates in pedicle valve. Brachial valve interior not investigated.

Comparison: Widest part of *Q. robusta* occurs in the posterior quarter to third of the brachial-valve length, that of *Q. sobrina* is located about at mid-length of the brachial valve. Further, the sulcus of *Q. robusta* is moderately deep and clearly separated from the flanks by rounded-angular edges, whereas the sulcus of *Q. sobrina* is very shallow to obscure.

Occurrence: Suchomasty Limestone, locality 5.

Quadrithyris orba Havlíček, 1959

Pl. XIX, fig. 1

1959 *Delthyris (Quadrithyris) orba* n. sp.; Havlíček, p. 130 and 243, pl. 22, figs. 11—13; text-fig. 60.

Exterior: shW: 10—15 mm; pvL/W: about 70 %; bvL/W: 64—72 %; shT/W: 75—90 %; suW/shW: 50—62 %. Ventral beak strong, incurved, its apex directed postero-dorsally. Sulcus shallow, rounded, rarely tending to be angular. High ventral interarea bounded by inconspicuous edges, about 53—60 % as wide as the maximum width of the shell, gently concave; its lower part procline, rarely almost catacline.

Brachial valve strongly convex in lateral view; dorsal fold rounded, originating near the posterior margin, highly raised above the gently convex flanks. Dorsal interarea short, orthocline to gently apsacline. Concentric fila fine (6—8 per 1 mm), separated by even finer concentric grooves. Fine radial ridges, located on tops of the fila, rarely preserved in specimens from the Suchomasty Limestone but clearly discernible in specimens from the Zlíchov Limestone.

Interior: Dental plates thin, high, always shorter than the high median septum that extends beyond three quarters of the valve length. Dental plates almost parallel to each other and define a deep, very narrow delthyrial cavity.

Cardinal process is a fine transverse plate filling the apical part of the notothyrium; hinge plates large, triangular in outline, highly raised above valve floor, anteriorly extending into sharp points; dorsal muscle field obscure (inner morphology exposed in free valves coming from the Zlíchov Limestone).

Occurrence: Zlíchov Limestone, Hlubočepy (U kapličky quarry). Suchomasty Limestone, localities 3, 5.

Quadrithyrina Havlíček, 1959

Quadrithyrina ivanovae Havlíček, 1959

Pl. XIX, fig. 2

1959 *Quadrithyrina ivanovae* n. sp.; Havlíček, p. 137 and 245, pl. 24, figs. 3, 4, 6; text-fig. 62.

Exterior: shW: 15—19 mm (the largest valve 21.0 mm); bvL/W: about 68 % (extremes: 62 and 74 %); shT/W: about 72 % (extremes: 68 and 79 %); shT/bvL: about 104 % (extremes: 97 and 114 %). Ventral beak strong, highly raised, terminating with a postero-dorsally directed apex. Sulcus weak in umbonal region but moderately deep and fairly broad (about half-width of the valve) anteriorly. Ventral interarea high, concave, steeply apsacline to catacline; delthyrium open.

Widest part of brachial valve about in its mid-length; hinge line short, lateral margins rounded. Dorsal beak moderately elevated above valve surface, posteriorly extending beyond the hinge line. Fold low, rounded; dorsal interarea short, low, apsacline. Ribbing absent. Microornament of low concentric fila (5—6 per 1 mm) never extending into concentric lamellae; spines and papillae not observed (due to less favourable preservation?).

Interior: Dental plates absent; median septum strong (1.0—1.5 mm thick in umbonal region), occupying slightly more than a third of the vale length. Muscle field elongate, slightly longer than the median septum, 1/6—1/8 as wide as the maximum width of the valve. Vascula media divergent, excavated in shell in places corresponding to the sulcus-bounding edges of the outer valve surface. Late adult pedicle valves bear genital markings in the form of elongate pits tending to coalesce into radial canals.

Umbonal region of brachial valve so thickened that the posterior portions of the hinge plates are supported by secondary shell material

(text-fig. 62 in Havlíček 1959); dorsal muscle field elongate-oval, confined to the trough corresponding to the fold of the outer valve surface, and anteriorly extending to about mid-length of the valve; it is bounded laterally by ridges. Myophragm does not reach the front margin of the muscle field. Vascula genitalia as in the pedicle valve.

Occurrence: Suchomasty Limestone, localities 3, 5, 8.

Reticulariidae Waagen, 1883

Eoreticularia Nalivkin, 1939

Eoreticularia indifferens (Barrande, 1848)

Pl. XVII, fig. 6

1959 *Eoreticularia indifferens* (Barrande, 1848); Havlíček, p. 158, pl. 26, figs. 1—3, 6; text-figs. 76—78.

Exterior: shW: 24—28 mm (the largest shell 33.1 mm); bvL/W: 61—79 %; shT/W: about 50 % (extremes: 42 and 59 %). Pedicle valve transversely elliptical, moderately and evenly convex both in transverse and lateral profiles. Ventral beak strong, incurved, terminating with a sharp apex directed postero-dorsally. Ventral interarea small, apsacline, usually less wide than half-width of the valve, defined by inconspicuous, subangular edges; distance between the ventral and dorsal beak ranges from 1.8 to 2.8 mm. Sulcus hardly perceptible in umbonal region; in anterior part of the valve, it is shallow, gently concave, separated from flanks by weak, rounded edges.

Brachial valve low, rather variable in outline, widest at about its mid-length; hinge line short, gradually passing into the evenly rounded sides; in dorsal view, anterior margin nearly straight or slightly curved towards hinge line. Dorsal beak small, gently elevated, hardly extending beyond the hinge line. Fold either absent or forming a very short and low elevation just at the front margin of the valve, gradually passing into the flanks. Dorsal interarea almost indistinct. Ribs absent. Concentric rugellae better developed near front margin than in umbonal region, never extending into concentric lamellae. Fine granules preserved exceptionally; they are densely crowded in oblique rows, 12—13 per 1 mm, 10 mm from the hinge.

Interior: Dental plates less long than a third of the valve length, slightly divergent, on their inner sides sometimes bearing short extensions recalling subdelthyrial plates (see text-fig. 78b in Havlíček 1959).

Hinge plates minute, not resting on the valve floor, less commonly underlain by a secondary shell material that forms a short median ridge.

Occurrence: Suchomasty Limestone, mostly old collections; rare at localities 3 and 5.

Eoreticularia fraterna (Barrande, 1879)

Pl. XIX, fig. 5; pl. XXIV, fig. 2; text-fig. 30

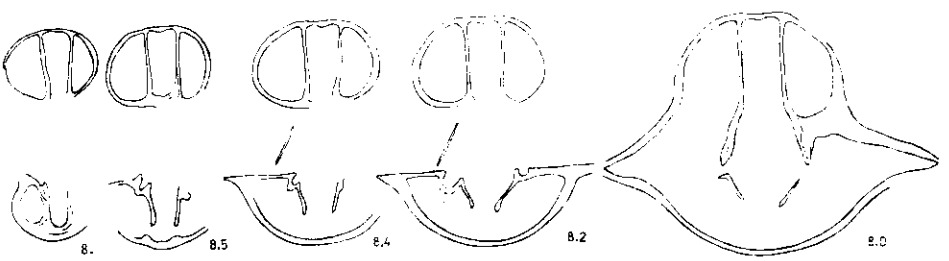
1959 *Eoreticularia fraterna* (Barrande, 1879); Havlíček, p. 162, pl. 26, figs. 4, 5, 7, 8; text-figs. 79—84.

1971 *Eoreticularia fraterna* (Barr.); Havlíček, pl. 1, fig. 1.

Exterior: shW: 10.0—18.0 mm; pvL/W: 68.7—88.3 %; bvL/W: 64.3—81.4 %; shT/W: 53.1—64.0 % (exceptionally 70.6 %). Shell ventri-biconvex, with pedicle valve longer than the brachial valve, less commonly pedicle valve as long as the brachial valve in specimens with procline interarea and small ventral beak. In lateral profile, pedicle valve almost evenly convex; sulcus shallow, occupying about half-width of the valve, gradually passing into the moderately convex flanks, usually bearing a median groove. Tongue low, arcuate. Ventral interarea low, bounded by obtuse edges, very steep, incurved below the apex, about 50 % as broad as the maximum width of the valve.

Brachial valve evenly convex in transverse profile, usually without a fold; rarely, a weak elevation occurs just at front margin of the valve. Hinge line short, sides of valve evenly rounded; anterior margin gently curved or straight, less commonly gently emarginate; widest part of brachial valve about at its mid-length. Dorsal interarea strongly reduced. Ribs absent.

Microornamentation consists of fine granules arranged in regular concentric rows, or the granules fuse to form fine concentric rugellae of subequal size; the rugellae never change into concentric lamellae.



30. *Eoreticularia fraterna* (Barrande); transverse serial sections, ×5

Interior: See text-fig. 30.

Occurrence: Suchomasty Limestone, localities 3, 5, 8, 12. Acanthopyge Limestone, localitiies 6, 7, 10, 11. Chabičov Member (Eifelian), Horní Benešov in the Nízký Jeseník Mts. (Havlíček - Pek 1986).

Undispirifer Havlíček, 1957

Undispirifer transiens (Barrande, 1879)

1959 *Undispirifer transiens* (Barrande, 1879); Havlíček, p. 169, pl. 17, figs. 8, 9; text-figs. 87—89.

Occurrence: Suchomasty Limestone, mostly old collections.

Bojothyrididae fam. n.

Diagnosis: Shell brachythyrid, non-costate, with a shallow sulcus and an obscure fold; delthyrium restricted by slender deltidial plates. Microornamentation of fine concentric rugellae.

Thin dental plates converge to the high median septum to join it a small distance under its upper edge, thus forming a spondylium-like structure. Crural plates do not touch the floor of the valve.

Comparison: The *Bojothyrididae* are distinguished by their peculiar pedicle valve interior. *Bojothyris* is closely similar to *Eoreticularia* (*Reticulariidae*) by its overall shape of shell, but it strikingly differs from the latter in having a high median septum and a spondylium-like structure in its pedicle valve.

Bojothyris Havlíček, 1959

Bojothyris nikiforovae Havlíček, 1959

Pl. XX, figs. 7, 8; pl. XXIV, fig. 1; text-fig. 31

1959 *Bojothyris nikiforovae* n. sp.; Havlíček, p. 147, and 248, pl. 24, figs. 1, 2; text-fig. 68.

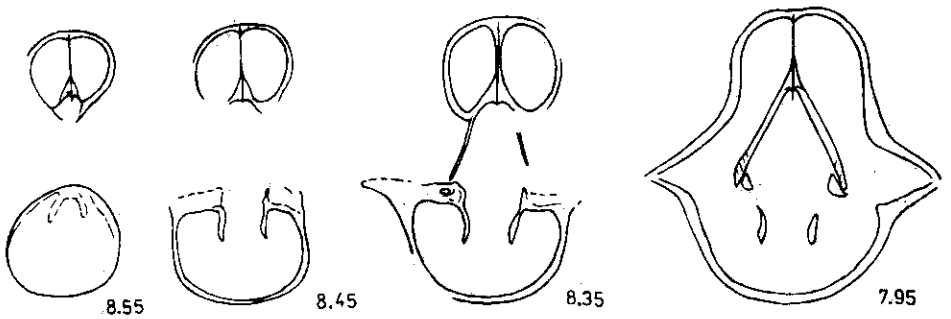
1971 *Bojothyris nikiforovae* Havl.; Havlíček, pl. 3, fig. 2.

Exterior (based on population of the Acanthopyge Limestone): Shell brachythyrid, ventri-convex, non-costate, with the following features: shW: 13.0—16.7 mm; pvL/W: 67.0—71.0 % (extreme: 79.3 %); bvL/W: 67.0—71.7 %; shT/W: 58.1—67.0 %. In side view, pedicle valve more convex umbonally than anteriorly; ventral beak small, incurved, with an apex directed postero-dorsally. Ventral interarea high, below the beak concave, steeply apsacline to procline, separated by weak edges from the flanks; delthyrium open. Sulcus shallow, concave, in some specimens bearing a subangular groove on its bottom, bounded laterally by weak, rounded edges. Tongue high, arcuate.

Brachial valve evenly convex in lateral profile; its median sector more convex than the flanks. Widest part of brachial valve between its posterior third and mid-length. Sides evenly rounded, anterior margin gently

curved to almost straight. Fold either absent or hardly perceptible near front margin. Dorsal interarea small, nearly orthocline.

Concentric rugellae fine, usually with anterior faces steeper than the posterior ones, never extending into concentric lamellae. Rugellae equal to subequal in size, some of them more accentuated than the others. Radial capillae absent, the subsurface layer exceptionally exhibits continuous to discontinuous striations [VH-2474].



31. *Bojothyris nikiforovae* Havlíček; transverse serial sections, ×8

Interior: See text-fig. 31.

Remarks: By contrast to the population of the Acanthopyge Limestone, the size and shape of the specimens from the Suchomasty Limestone are strikingly variable; besides the rather large shells with steep ventral interareas, the Suchomasty Limestone has yielded also the shells 9.5—13.0 mm wide (young specimens?) with pedicle valves 70.0—96.0 % as long as wide owing to less steep inclination of their ventral interareas.

By its general aspect and presence of a median septum, *Spirifer imperficiens* Barr. is closely similar to *B. nikiforovae*. It differs from the latter, however, in having fine radial capillae, a feature not found in *B. nikiforovae*. As Barrande's collection contains only one shell of *Spirifer imperficiens* (probably coming from the Acanthopyge Limestone), we are not able to atribute it to a relevant genus; in any case, it is not conspecific with *Eoreticularia fraterna* as assumed by Havlíček (1959).

Occurrence: Suchomasty Limestone, localities 3, 5, 15. Acanthopyge Limestone, localities 10, 11. Havlíček (1959) assumed that the Vinařice Limestone is the type horizon of *B. nikiforovae*; this statement is incorrect as the holotype most probably comes from the Suchomasty Limestone deposited in a neptunian (sedimentary) dike penetrating deep into the Pragian sequence.

Xenomartiniidae Havlíček, 1971

Alaskospira Kirk & Amsden, 1952

Alaskospira accedens (Barrande, 1879)

Pl. XXII, figs. 3, 4

1879 *Spirifer accedens* Barr.; Barrande, pl. 4, fig. 6.
1959 *"Spirifer" accedens* Barrande, 1879; Havlíček, p. 198.
1971 *Proreticularia obses* sp. n.; Havlíček, p. 25, pl. 7, figs. 1, 2, 6, 10, 11, 15.

Exterior: shW: 8.6—11.0 mm (8 specimens measured); pvL/W: 78.3—87.2 %; bvL/W: 72.1—81.3 %; shT/W: 56.7—67.6 %. Pedicle valve almost evenly convex in side view with a very shallow to almost indistinct sulcus; anterior commissure slightly bent in dorsal direction; ventral interarea low, steep, incurved.

Brachial valve more convex in posterior part than anteriorly, widest near the posterior margin; cardinal angles narrowly rounded. Fold absent, flanks either smooth or bearing extremely weak plications (2—3 pairs) discernible only at valve margins. Fine ornamentation consists of concentric fila (about 10—12 per 1 mm anteriorly); short radial striae located on the fila are hardly discernible owing to the imperfect state of preservation.

Interior: Dental plates and median septum absent. Crural plates underlain by secondary shell accumulations.

Remarks: This species involves both the non-costate forms and the forms with weak plications along their anterior margins. The presence or absence of radial plications cannot warrant erection of two separate species because of gradual transitions between the two forms. Some shells bear so extremely weak plications that we are not able to assign them either to the smooth *"obses"* form or to the plicate *"accedens"* form.

Occurrence: Suchomasty Limestone, locality 5.

Quasimartinia Havlíček, 1959

Type species: *Quasimartinia rectimarginata* Havlíček, 1959.
Junior synonym: *Candispirifer* Havlíček, 1971.

Diagnosis (emended): Shell smooth, small to medium in size with a wide hinge line; cardinal angles rounded. Pedicle valve highly elevated, ventral beak strong, incurved; ventral interarea low, delined by obtuse angles; delthyrium open; deltidial plates slender, never fusing into a deltidium. Ventral sulcus absent or narrow, usually weak. Brachial valve moderately convex, subrectangular in outline, usually without a

fold and sulcus, less commonly medianly flattened to slightly depressed (e.g. in *Q. rectimarginata*), or bearing a weak, very short fold; anterior commissure rectimarginate to weakly uniplicate. Dorsal interarea low, anacline to orthocline. Shell surface devoid of both the microspines and radial capillae.

Dental plates absent, ventral muscle field gently impressed. Cardinal process knob-like, bisected by a median groove into two lobes; crural plates do not touch the inner surface of the valve; dental sockets floored by concave subsocket plates.

Remarks: Inner and outer morphology of *Quasimartinia* and *Candispirifer* are essentially the same except for slight variations of the anterior commissure. Havlíček (1959) assigned to *Quasimartinia* the smooth, rectimarginate shells devoid of dental plates; later on, he erected *Candispirifer* as a new genus to embrace the smooth, weakly uniplicate shells, also lacking the dental plates. After a reinvestigation of the type species of the two genera, the form of the anterior commissure turned to be not reliable enough to distinguish the two xenomartiniid genera. *Candispirifer candidus* (= type species of *Candispirifer*) has its anterior commissure more commonly weakly uniplicate than rectimarginate, while most shells of *Quasimartinia rectimarginata* (= type species of *Quasimartinia*) are rectimarginate, whereas the uniplicate specimens are rare (about 1 % of the Švarcenberský-quarry population). It is then evident that the anterior commissure alone is not a good distinguishing character among the xenomartiniids.

Quasimartinia lubrica sp. n.

Pl. XXII, figs. 5, 8

Holotype: Shell figured on pl. XXII as fig. 5; VH 4786a.
Type horizon and locality: Suchomasty Limestone, locality 5.
Material: 3 shells and several incomplete specimens.

Exterior: Similar to *Q. candida* (Havl.), lacking a fold in young specimens (smaller than 8.0 mm) but having a weak, very short fold near anterior margin in adult specimens. Ventral sulcus shallow to almost indistinct, tongue short, arcuate; flanks smooth. Ventral interarea nearly catacline, deeply concave, not clearly separated from the rest of the valve; delthyrium open. Microornamentation absent.

Dimensions of 3 shells: shW: 7.2; 10.5; 13.6 mm; pvL: 7.45; —; 12.2 mm; bvL: 6.4; 8.6; 11.0 mm; shT: 5.1; 7.5; 9.0 mm.

Interior: Median septum and dental plates absent; interior of brachial valve not investigated.

Comparison: *Q. candida* (Havl.) (Koněprusy Limestone) differs

from the new species in lacking the fold in all growth stages; further, its sulcus is formed as a shallow groove clearly narrower than the medial depression in the pedicle valve of *Q. lubrica.*

Occurrence: Suchomasty Limestone, locality 5. Acanthopyge Limestone, locality 2 (one shell only).

Obesaria Havlíček, 1957

Obesaria obesa (Barrande, 1848)

Pl. XIX, fig. 3; pl. XXIII, fig. 2

1959 *Obesaria obesa* (Barrande, 1848); Havlíček, p. 166, pl. 25, figs. 5—8; text-figs. 85, 86.

Occurrence: Acanthopyge Limestone, localities 2, 6, 10.

Martiniidae Waagen, 1883

Cingulodermis Havlíček, 1971

Cingulodermis columbina (Havlíček, 1959)

Pl. XXI, figs. 5—8

1959 *Martiniopsis columbina columbina* n. susp.; Havlíček, p. 190, pl. 28, figs. 3—5; text-fig. 97.

1959 *Martiniopsis columbina asellata* n. subsp.; Havlíček, p. 192, pl. 28, figs. 1, 2.

Exterior: Shell 9—12 mm wide, ventri-biconvex, with pedicle valve twice to four times as high as the brachial valve (depending on size of the fold). The largest shell available is 15.0 mm wide; shT/W: about 69.9 % (extremes: 59 and 78 %); bvL/shT: about 89.2 % (extremes: 79 and 106 %). Ventral interarea steeply apsacline to catacline; delthyrium restricted by deltidial plates. Sulcus shallow, about 54—61 % as wide as the pedicle valve, separated by rounded edges from the flanks.

Brachial valve gently convex, subrectangular, 60—75 % as long as wide; hinge line wide, cardinal angles obtuse to narrowly rounded. Dorsal interarea very low, orthocline to apsacline. Size of fold variable; fold usually appears between the posterior third and mid-length of the brachial valve, rarely originates just anterior to the beak; in several specimens, the weak fold originates in about two thirds of the valve length. Depending on size of the fold, anterior commissure is uniplicate to rectimarginate even in late adult growth stages. Different shape of the fold was used by Havlíček (1959) for erecting two subspecies, namely *C. c. columbina* with well-developed fold, and *C. c. asellata* lacking the fold. Recent extensive collection, however, has shown that the size and

shape of the fold, owing to intraspecific variability, are not constant features even within the same population. Many transitional forms, existing between the *columbella* and *asellata* "subspecies", give evidence against subdivision of *C. columbina* into separate subspecies.

Growth imbrications weaker than in *C. cingulata* Havl. Radial capillae fine (about 8 per 1 mm), rarely preserved on the uppermost layer of the shell.

Interior: The same as in *C. cingulata* Havl. (see text-fig. 97 in Havlíček, 1959). Dorsal muscle field elongate, weakly impressed, about a third as long as the valve, medianly with a ridge-like myophragm.

Occurrence: Suchomasty Limestone, localities 3, 5, 8. Acanthopyge Limestone, localities 2, 6, 7, 10, 11.

Ambocoeliidae George, 1931

Remarks: Attribution of this family to the *Spiriferacea* is questionable.

Metaplasia Hall & Clarke, 1894

Metaplasia nekvasilovae sp. n.

Pl. XXII, fig. 2

Holotype: Shell figured on pl. XXII as fig. 2; VH 4794c.
Type horizon and locality: Suchomasty Limestone, locality 5.
Name: After Dr. Olga Nekvasilová of the Czechoslovak Academy of Sciences.
Material: 11 shells and several incomplete specimens.

Exterior: Shell small, ventri-biconvex, with pedicle valve much higher than the gently convex brachial valve; shW: 4.5—5.4 mm; pvL/W: 91—112 % (in a young shell 4.5 mm wide: 89 %); shT/W: 72.2—84.0 % (in young shell 4.5 mm wide: 66 %); suW/shW: 38—42 % (extreme: 52 %).

Pedicle valve strongly and evenly convex with a strong, incurved beak; hinge line wide, cardinal angles obtuse. Sulcus narrow, rounded to rounded-angular, separated by rounded ribs from the flanks; tongue short, arcuate. Ventral interarea nearly catacline, concave, bordered by obtuse edges; delthyrium partly restricted by minute deltidial plates.

Brachial valve moderately wider than long, maximum width near the hinge line at about a quarter, less commonly a third of the valve length. Fold rounded, narrow; lateral ribs (only one pair) always less strong than the fold. Microornamentation not preserved.

Interior: Dental plates missing.

Comparison: By its small size and general aspect *M. minuta* Boucot (Onondaga Stage, Maine; Boucot 1959) is closely similar to the new species, but it differs from the latter in having strongly apsacline and gently incurved ventral interarea, whereas that of *M. nekvasilovae* is deeply concave and its lower part makes about a right angle with the lateral commissure (catacline condition).

Occurrence: Suchomasty Limestone, locality 5.

Ambocoelia Hall, 1860

Ambocoelia mesodevonica Havlíček, 1959

Pl. XXII, fig. 1

1959 *Ambocoelia mesodevonica* n. sp.; Havlíček, p. 173, pl. 27, figs. 9, 10.

Occurrence: Suchomasty Limestone, locality 5 (rare); Acanthopyge Limestone, locality 7.

Suessiacea Waagen, 1883

Cyrtinidae Frederiks, 1912

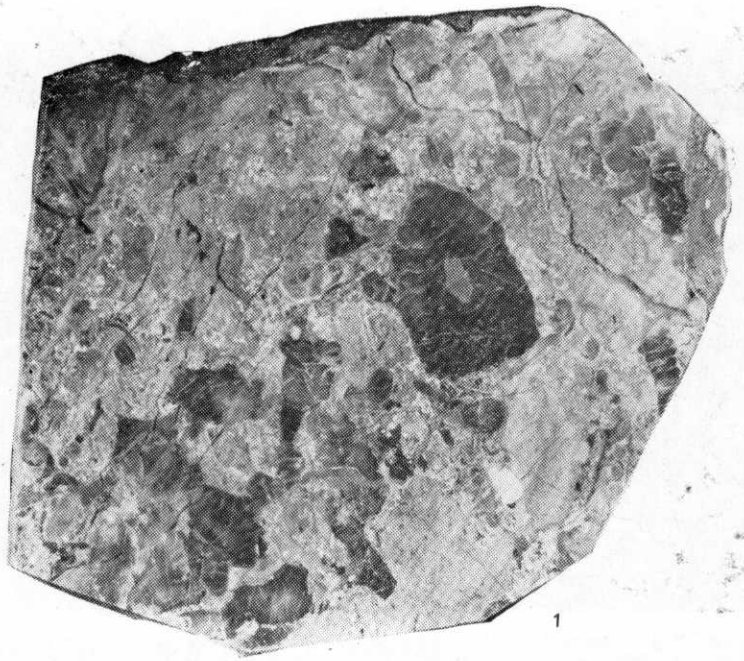
Cyrtina platypleura sp. n.

Pl. XXI, figs. 3, 4; text-fig. 32

Holotype: Shell figured on pl. XXI as fig. 3; VH 3320a.
Type horizon and locality: Suchomasty Limestone, locality 8.
Material: 18 shells.

Exterior: Shell 7.0—10.5 mm wide (the youngest specimen 4.0 mm wide), with hemipyramidal pedicle valve much higher than the moderately convex brachial valve. Pedicle valve triangular in lateral profile, with an erect beak, in side view flat to gently convex between the beak and front margin. Ventral interarea highly triangular, steeply procline to catacline, flat or sligthly concave below the apex. Deltidium convex, below the apex pierced by an elliptical pedicle foramen. Sulcus shallow, subangular; flanks of pedicle valve bear 2 (rarely 3) pairs of low, rounded costae as broad as the interspaces.

Brachial valve 66—79 % as long as its maximum width, widest between its posterior quarter and mid-length; cardinal angles narrowly rounded; anterior and lateral margins evenly arcuate; fold narrow and low, by its size recalling a median costa that originates just in front of the beak. Flanks of brachial valve gently convex, bearing 2 (less commonly 1) pairs of low ribs. Concentric lamellae rarely preserved due to exfoliation



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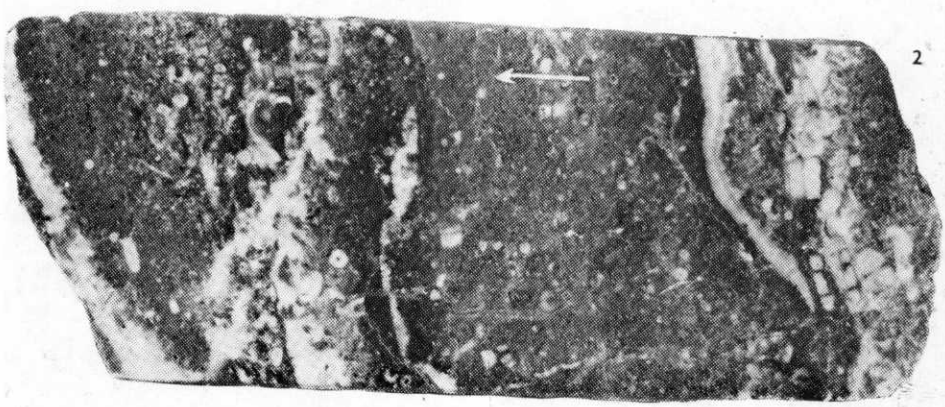

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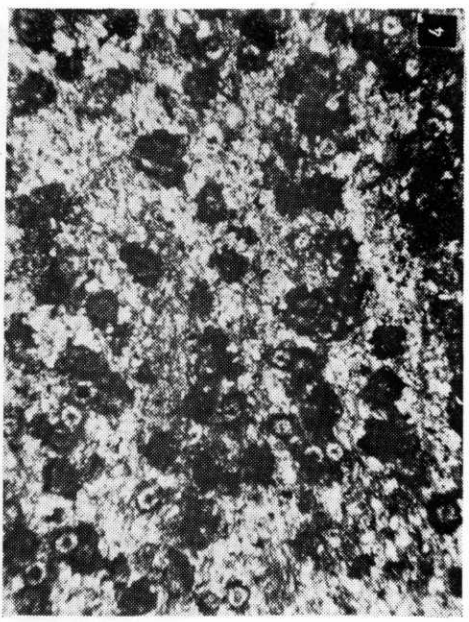
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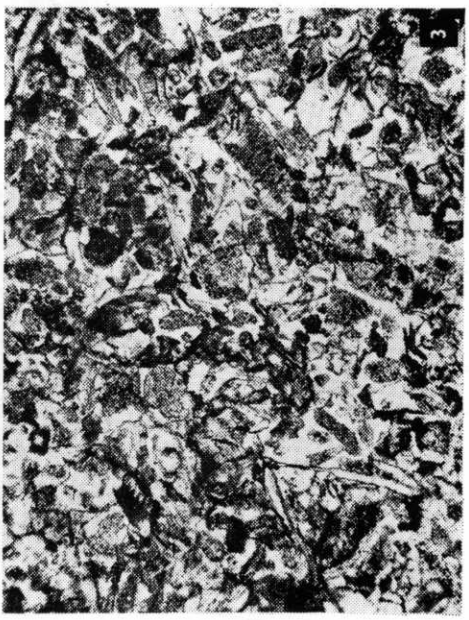
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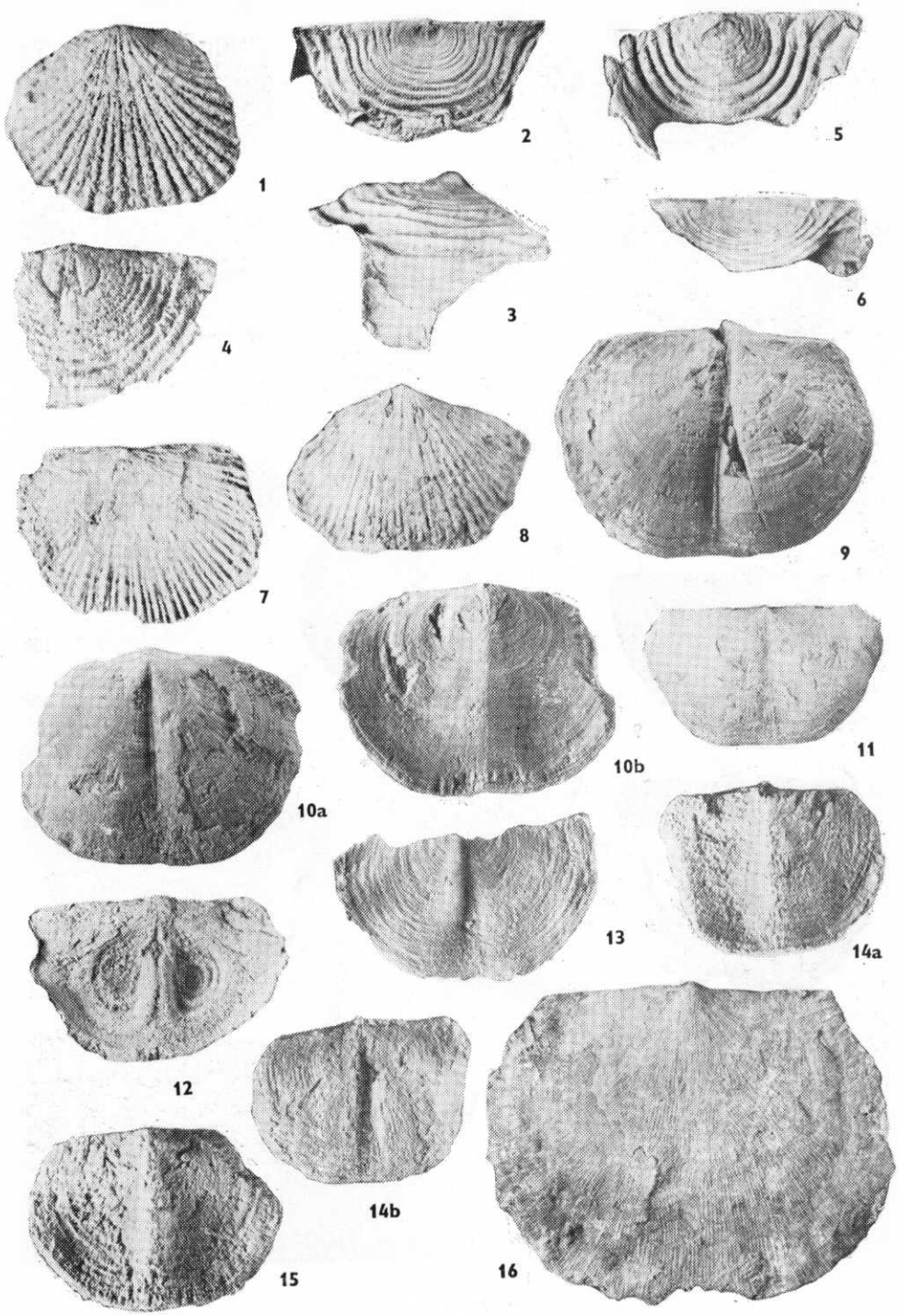
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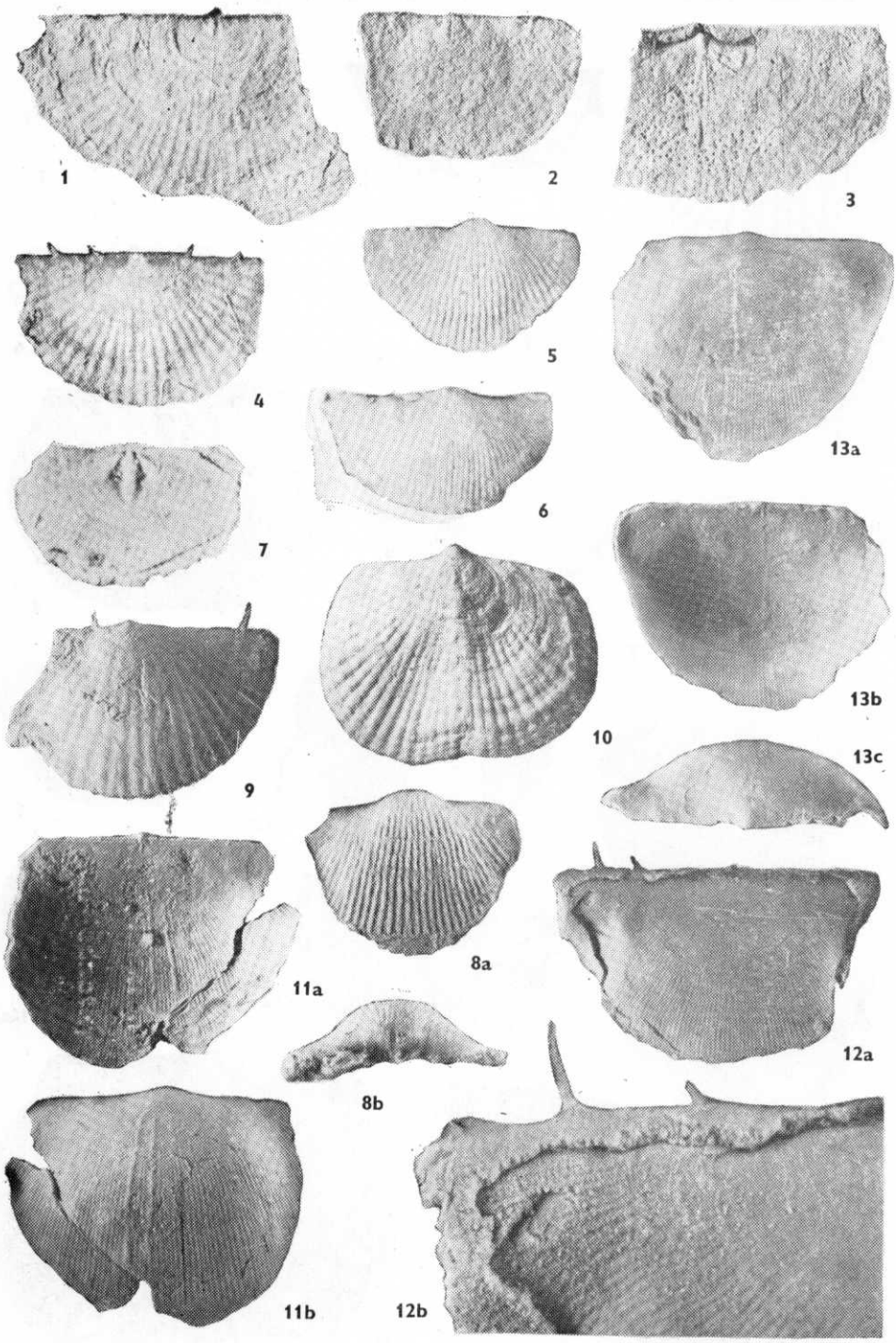
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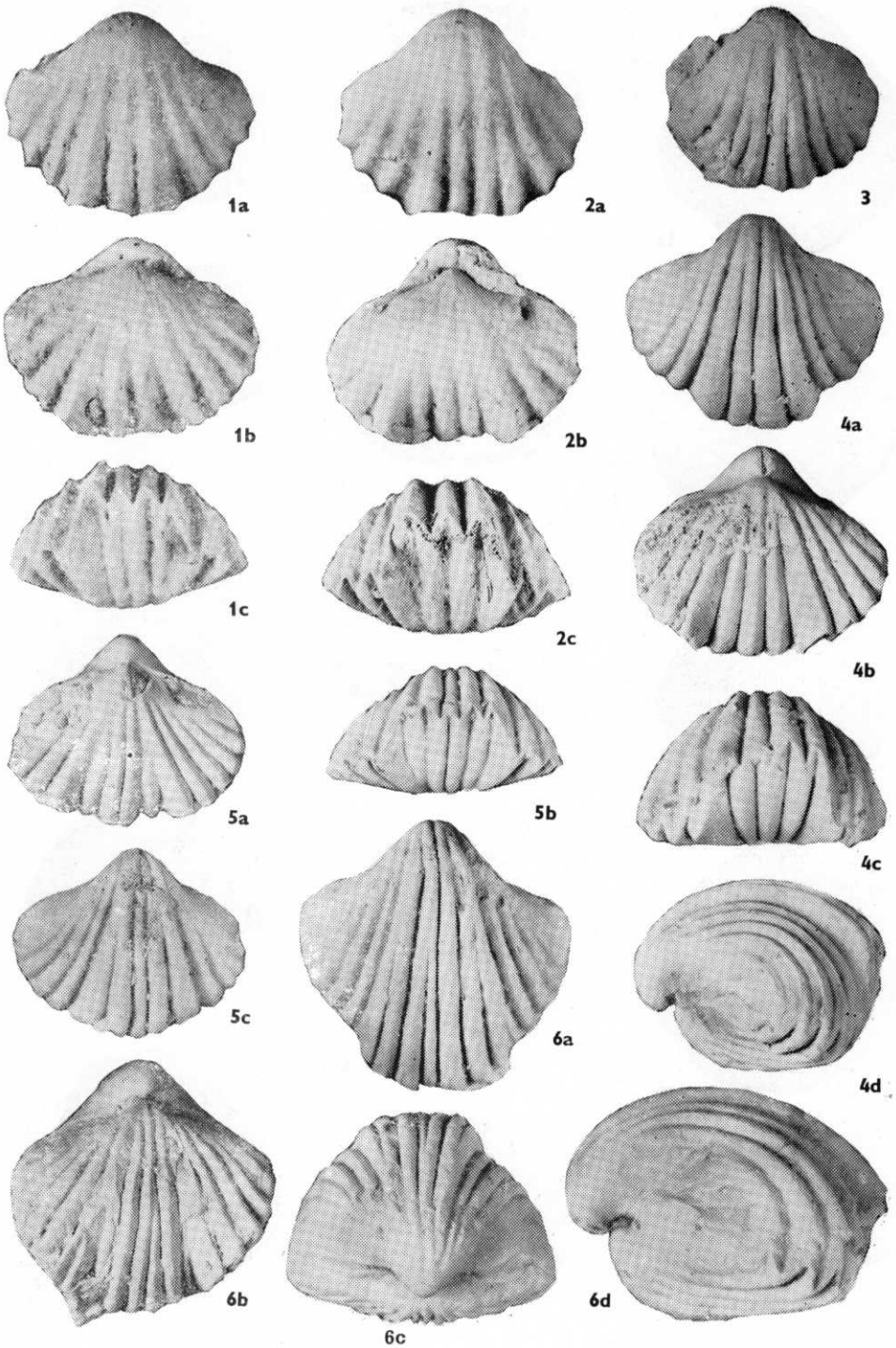
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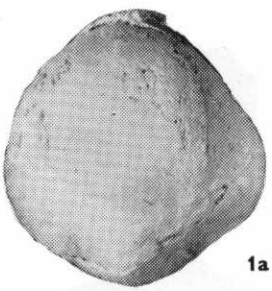

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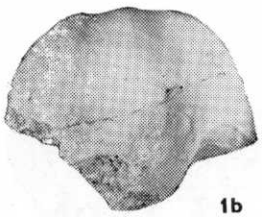

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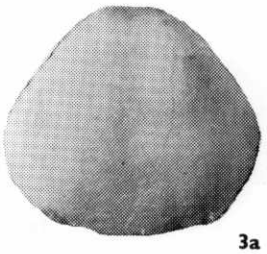

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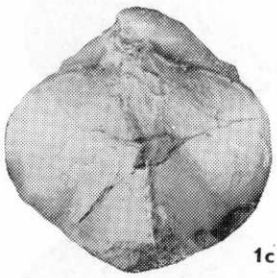

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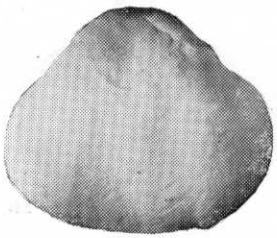

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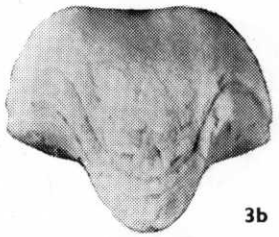

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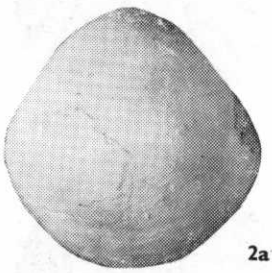

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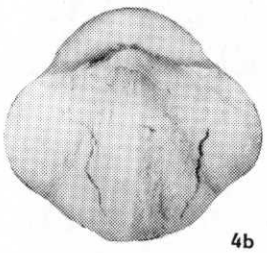

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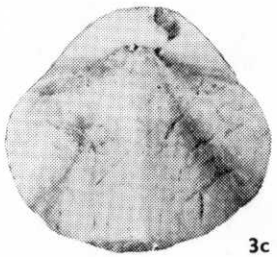

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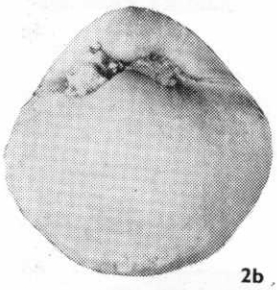

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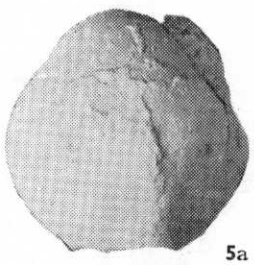

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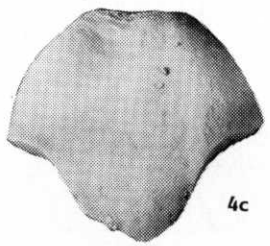

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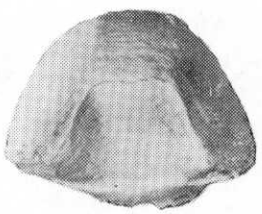

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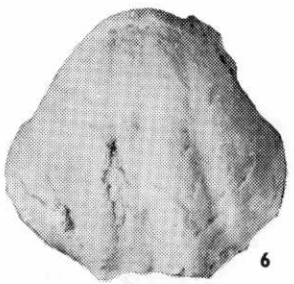

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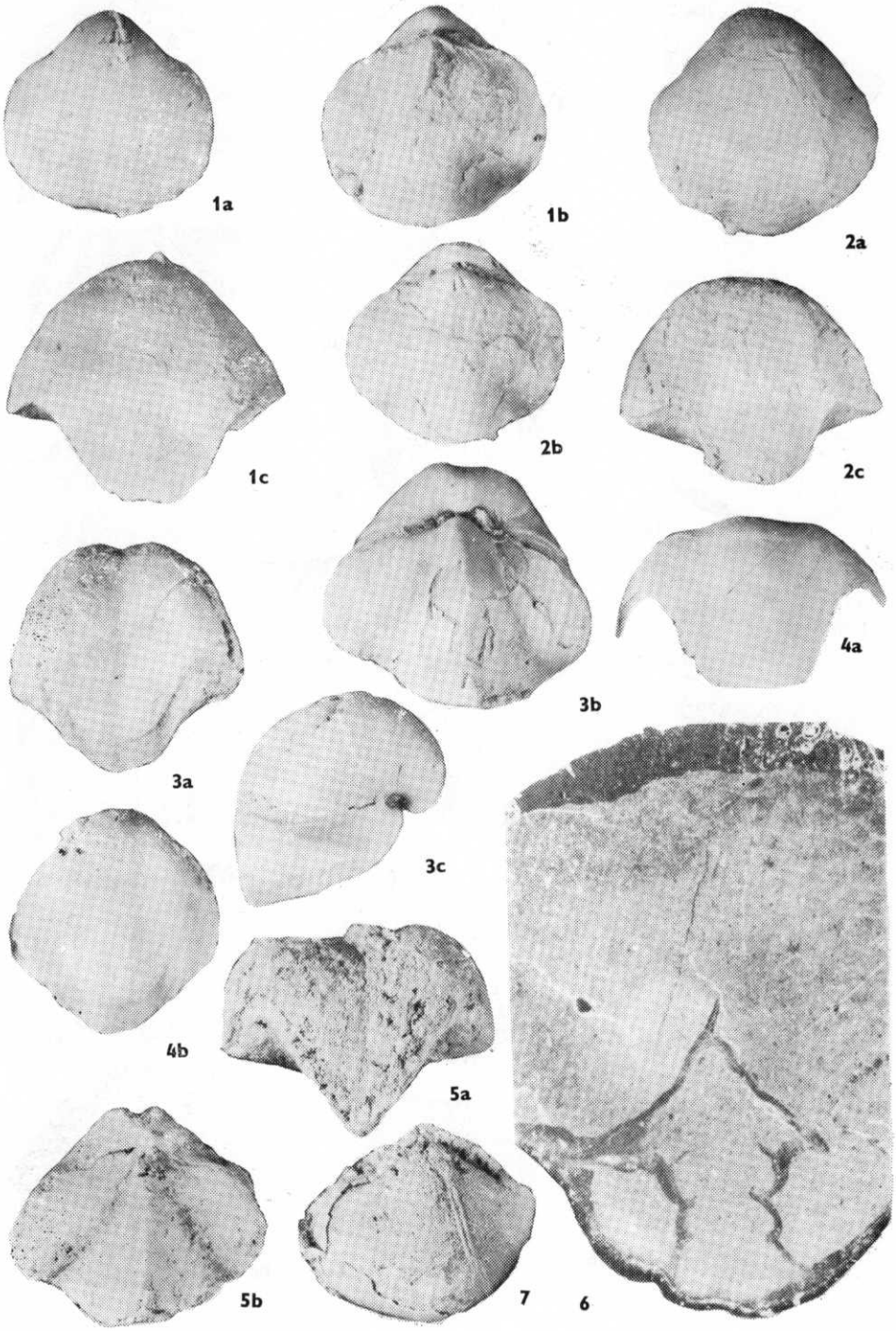
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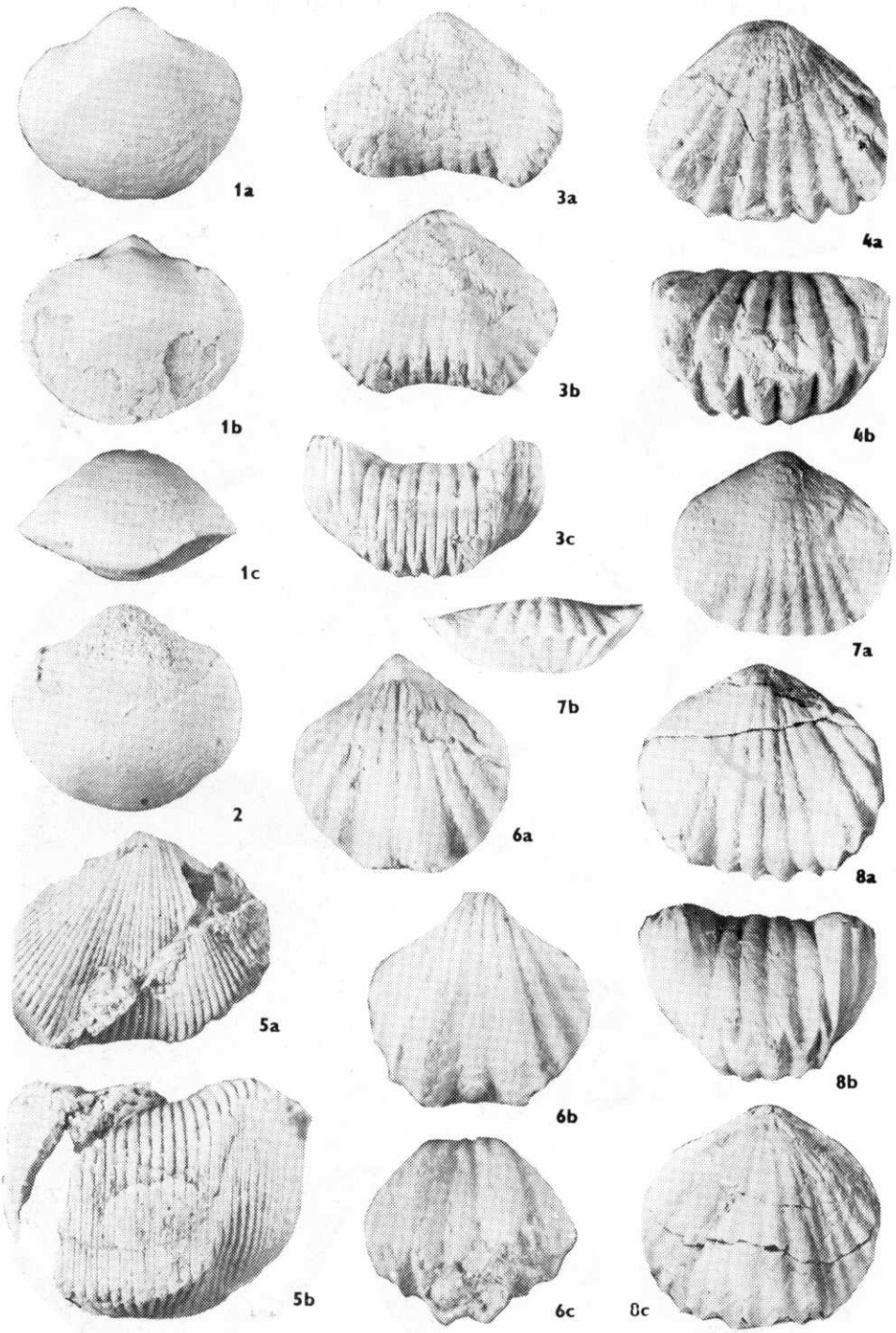
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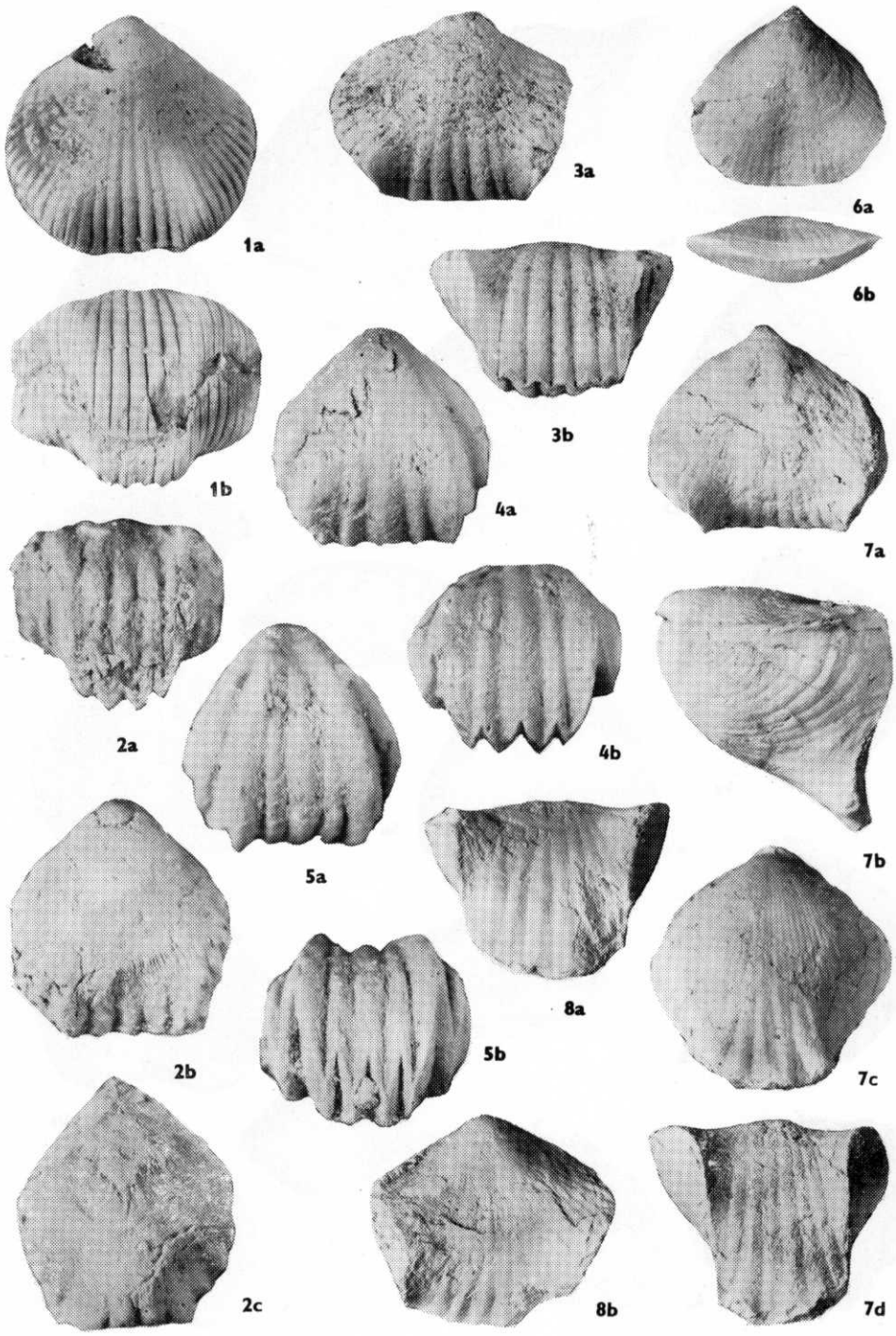
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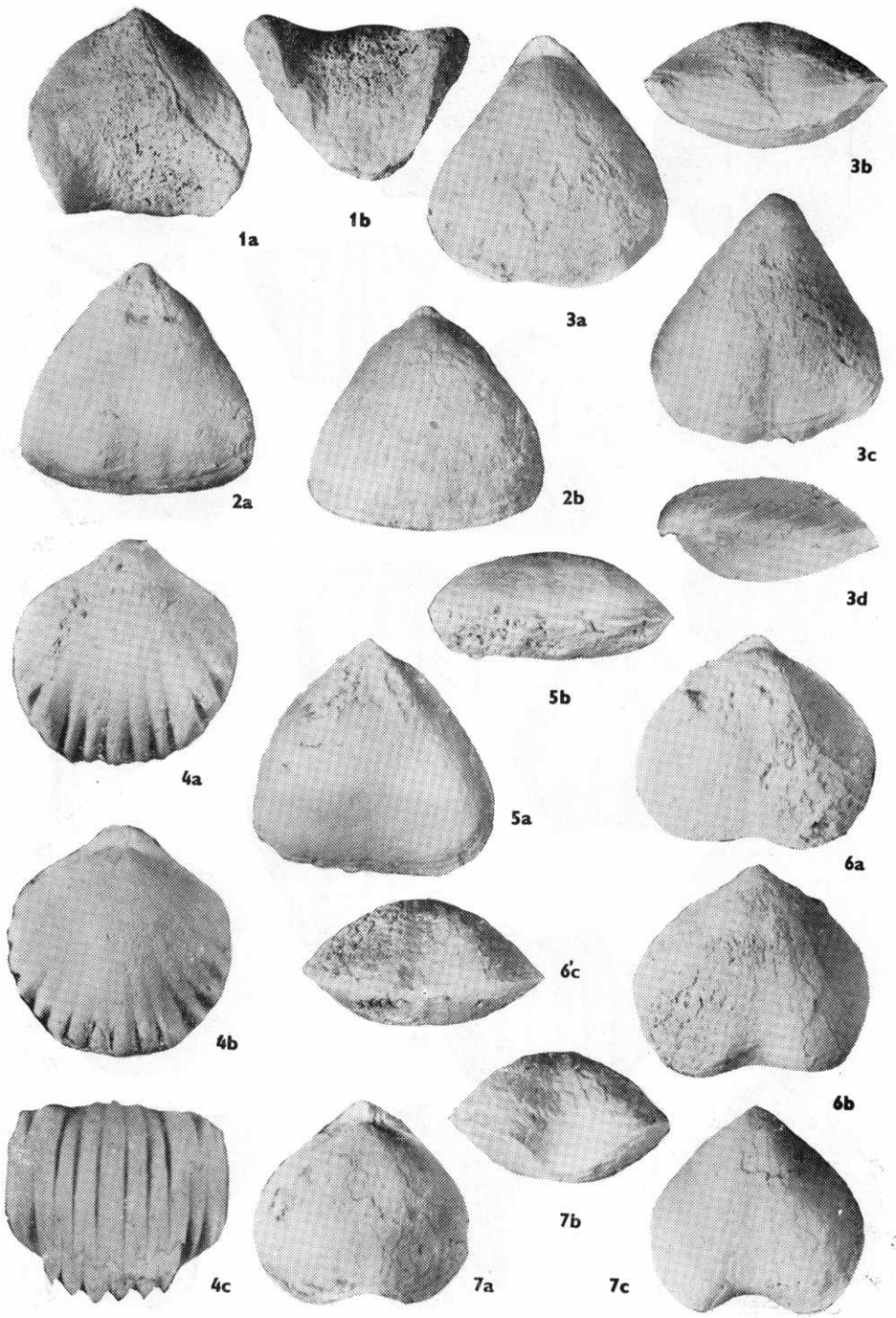
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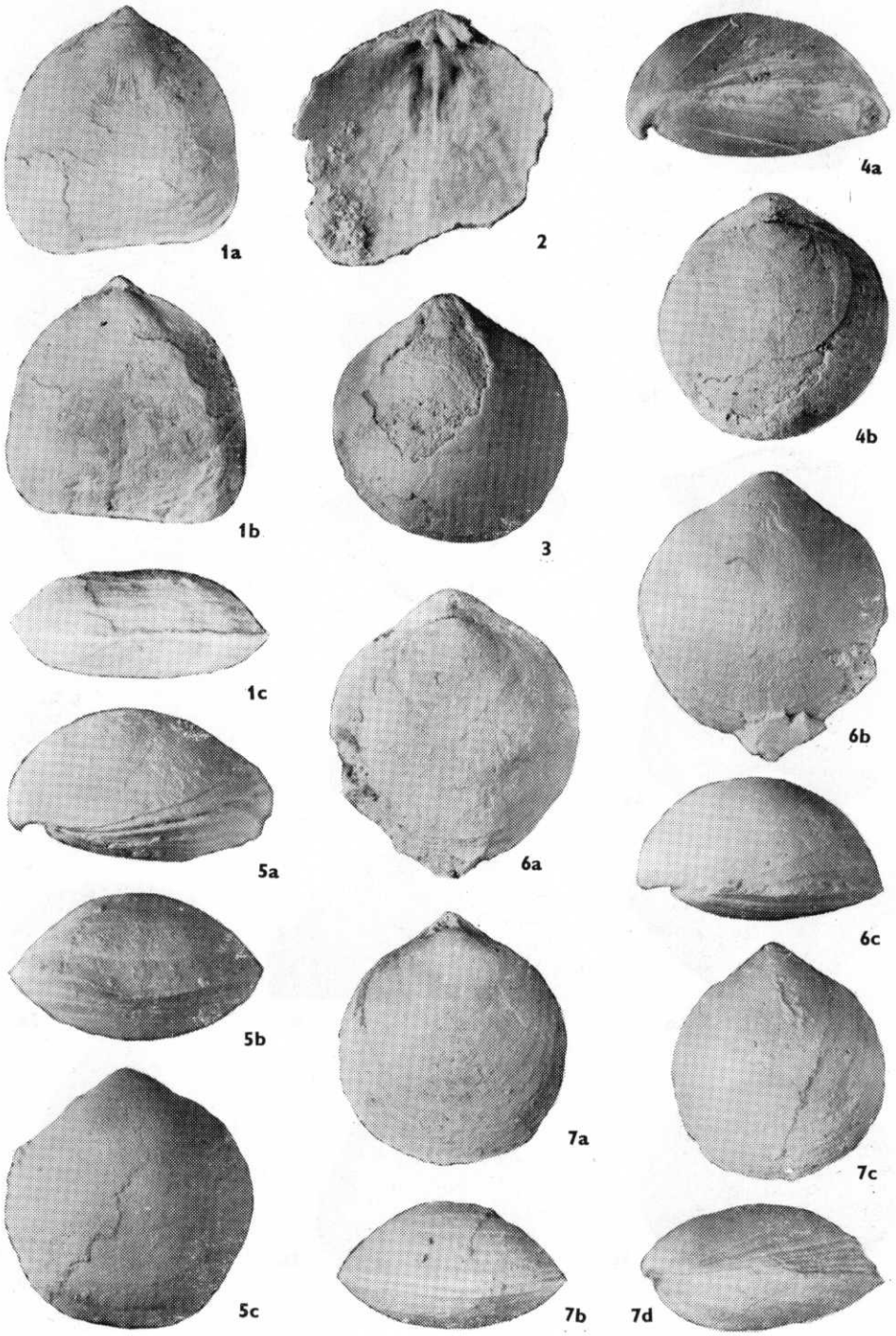
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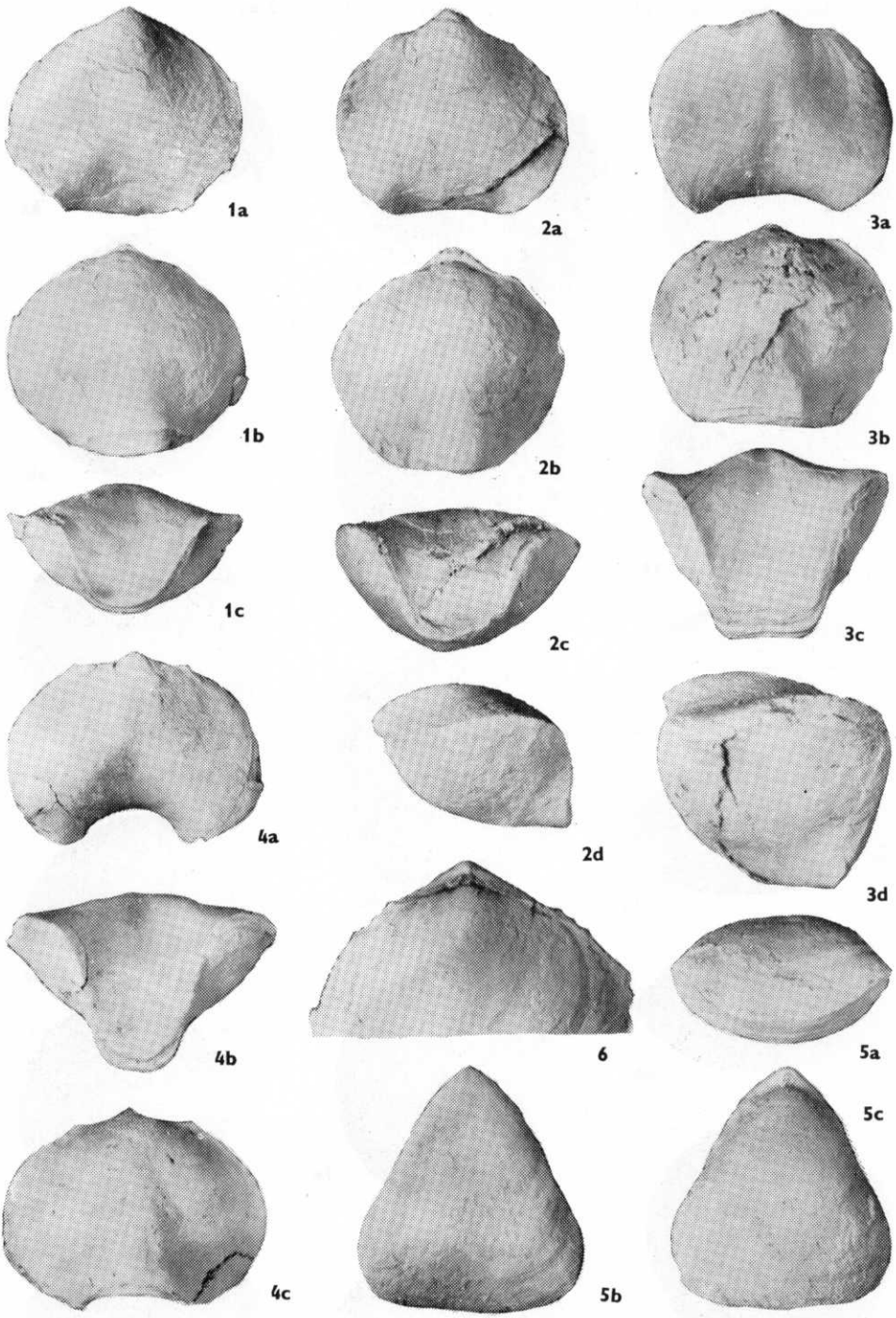
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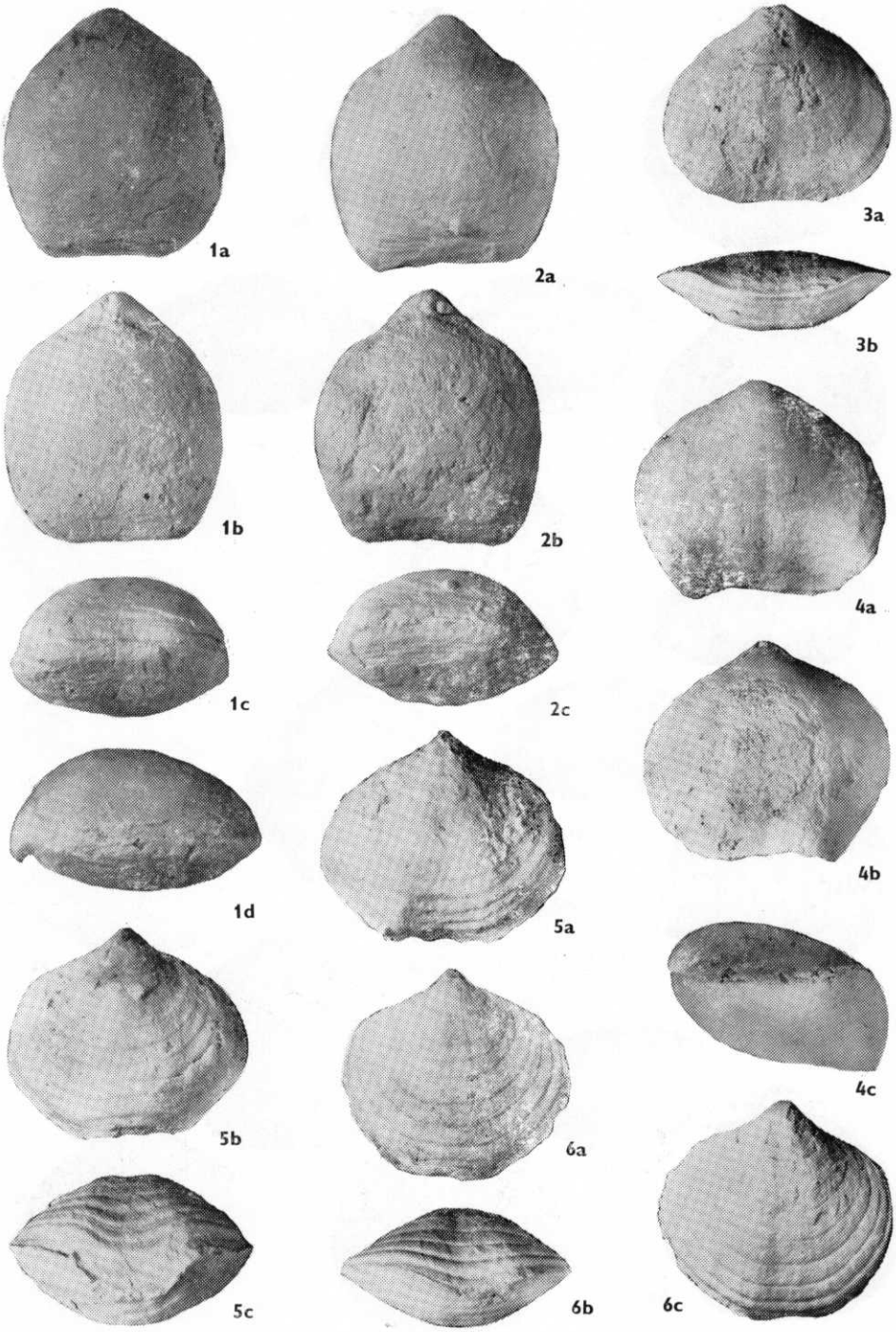
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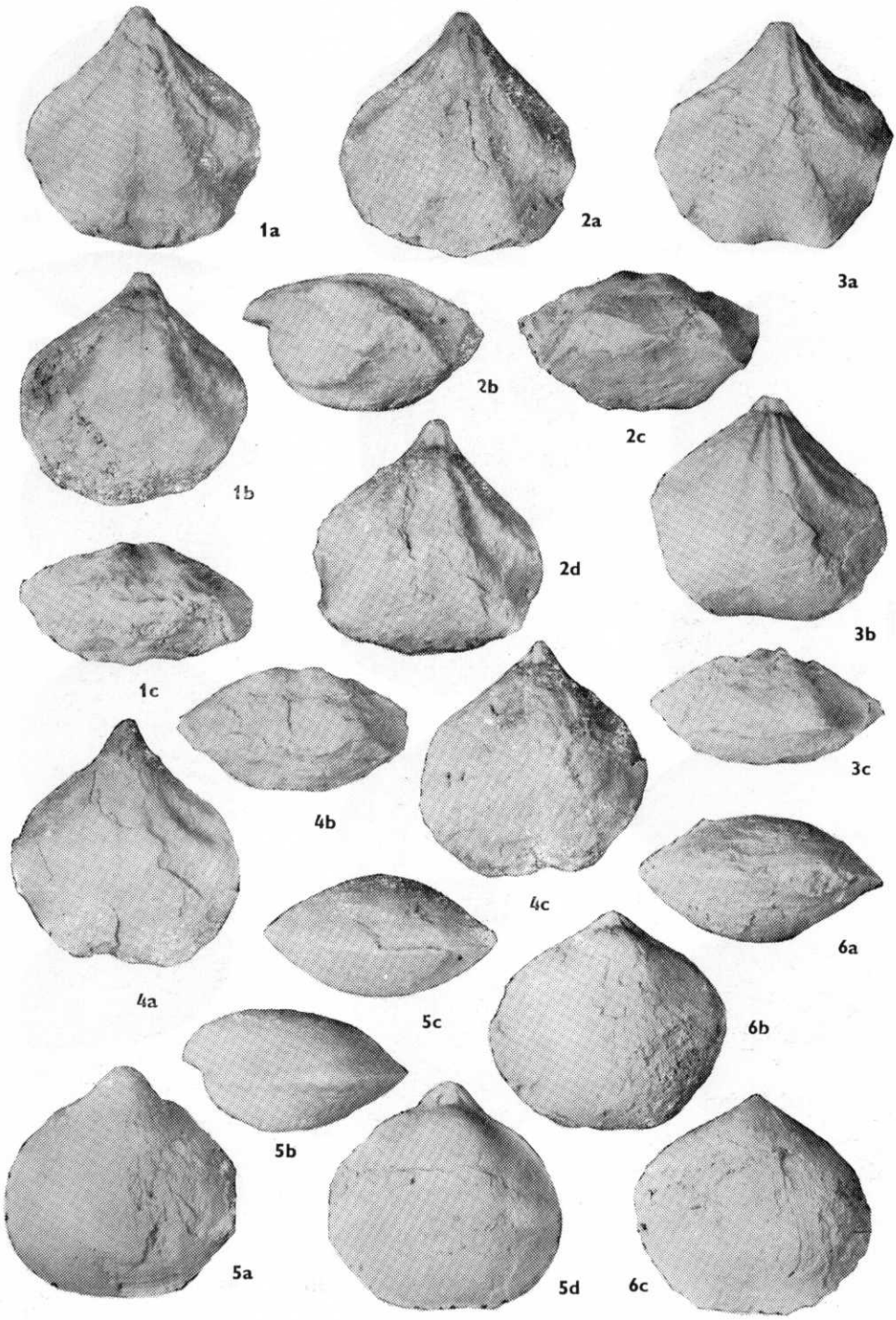
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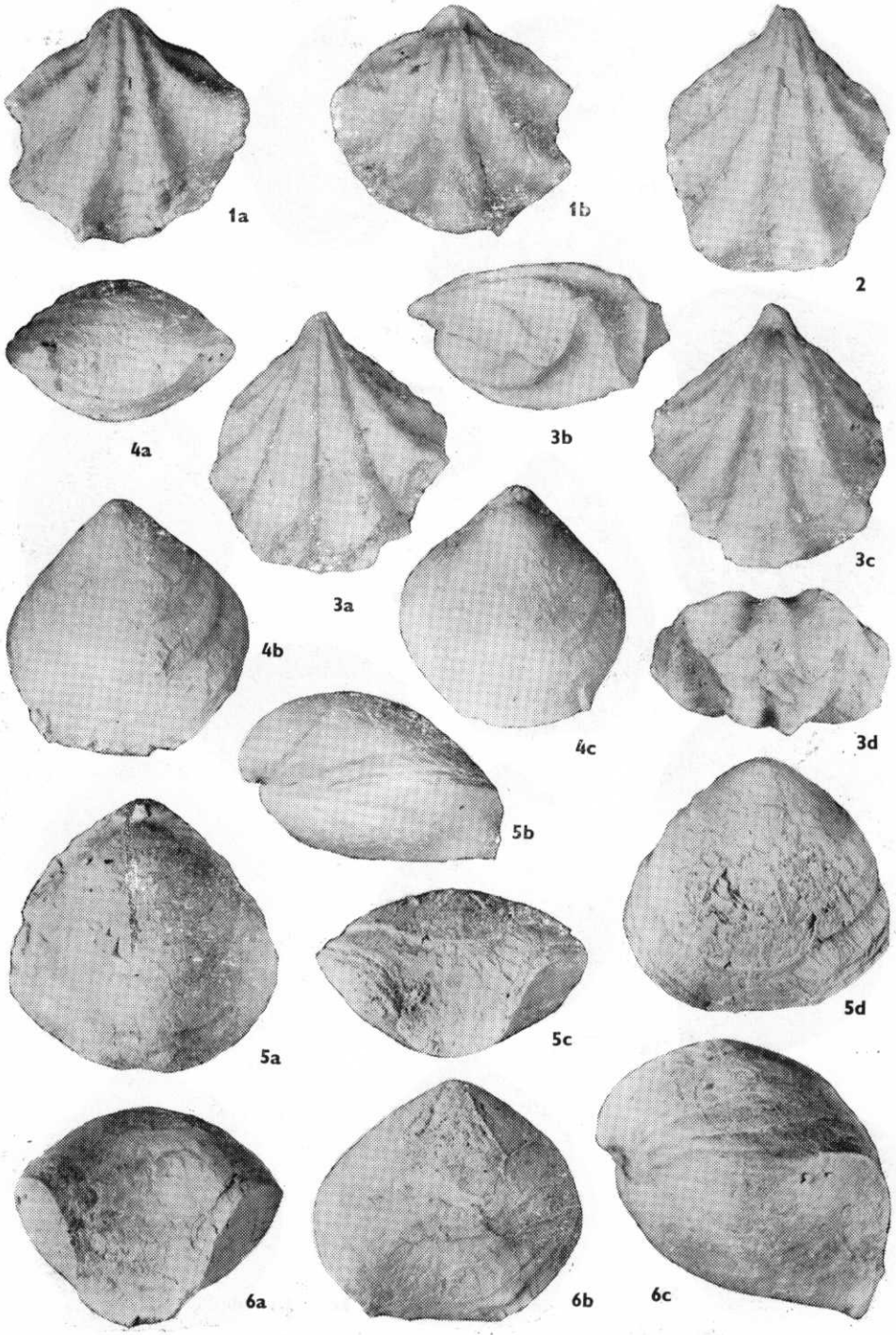
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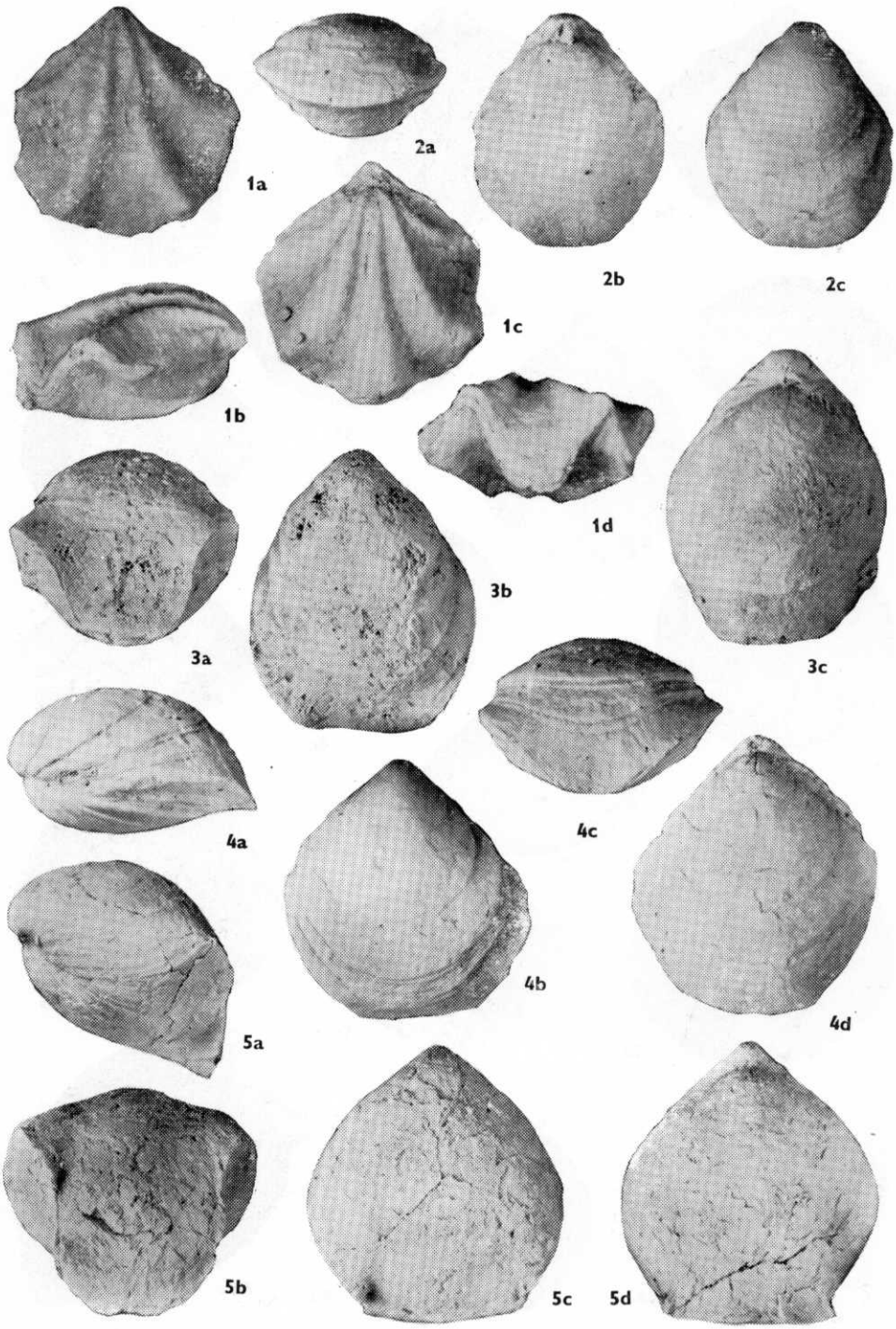
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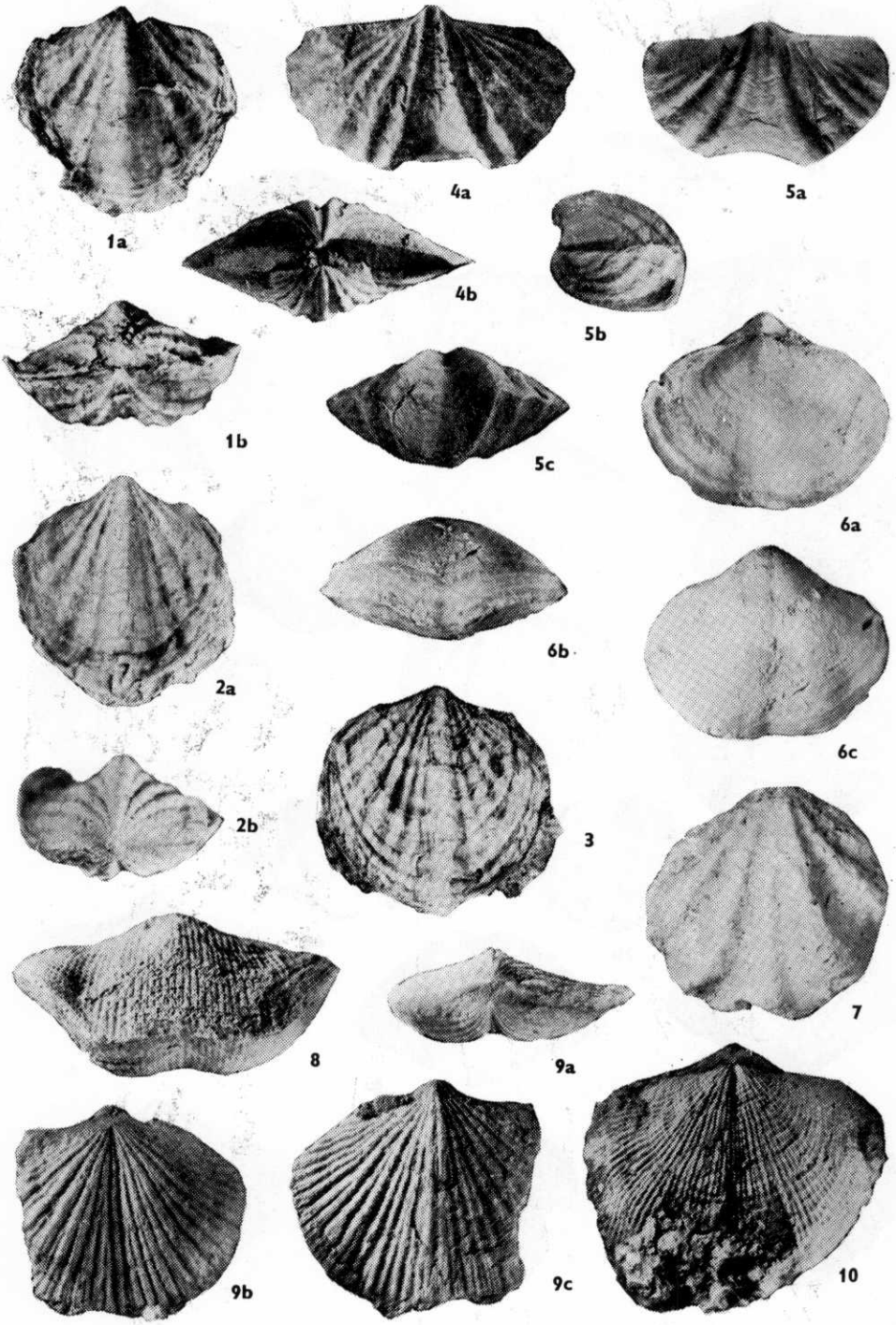
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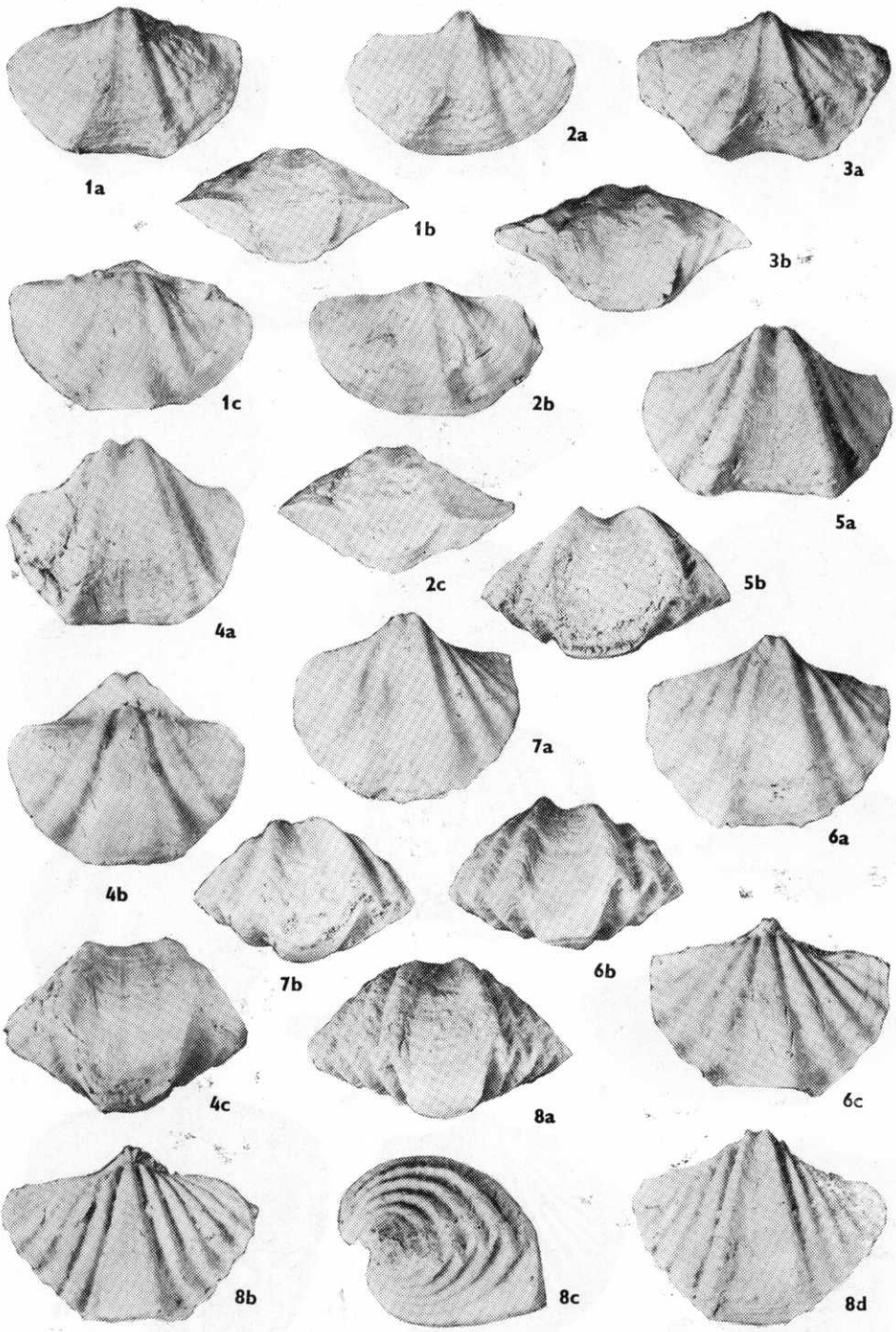
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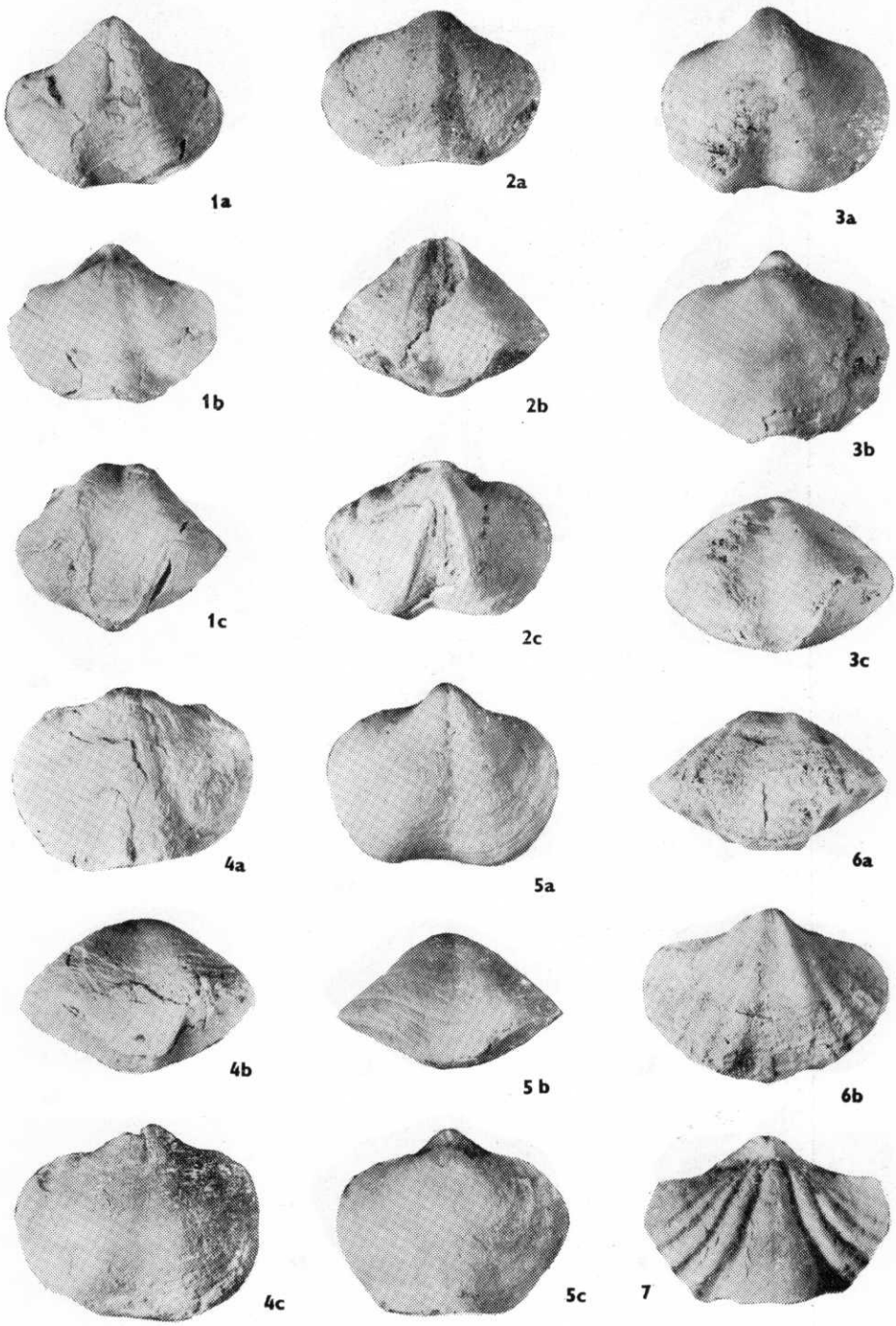
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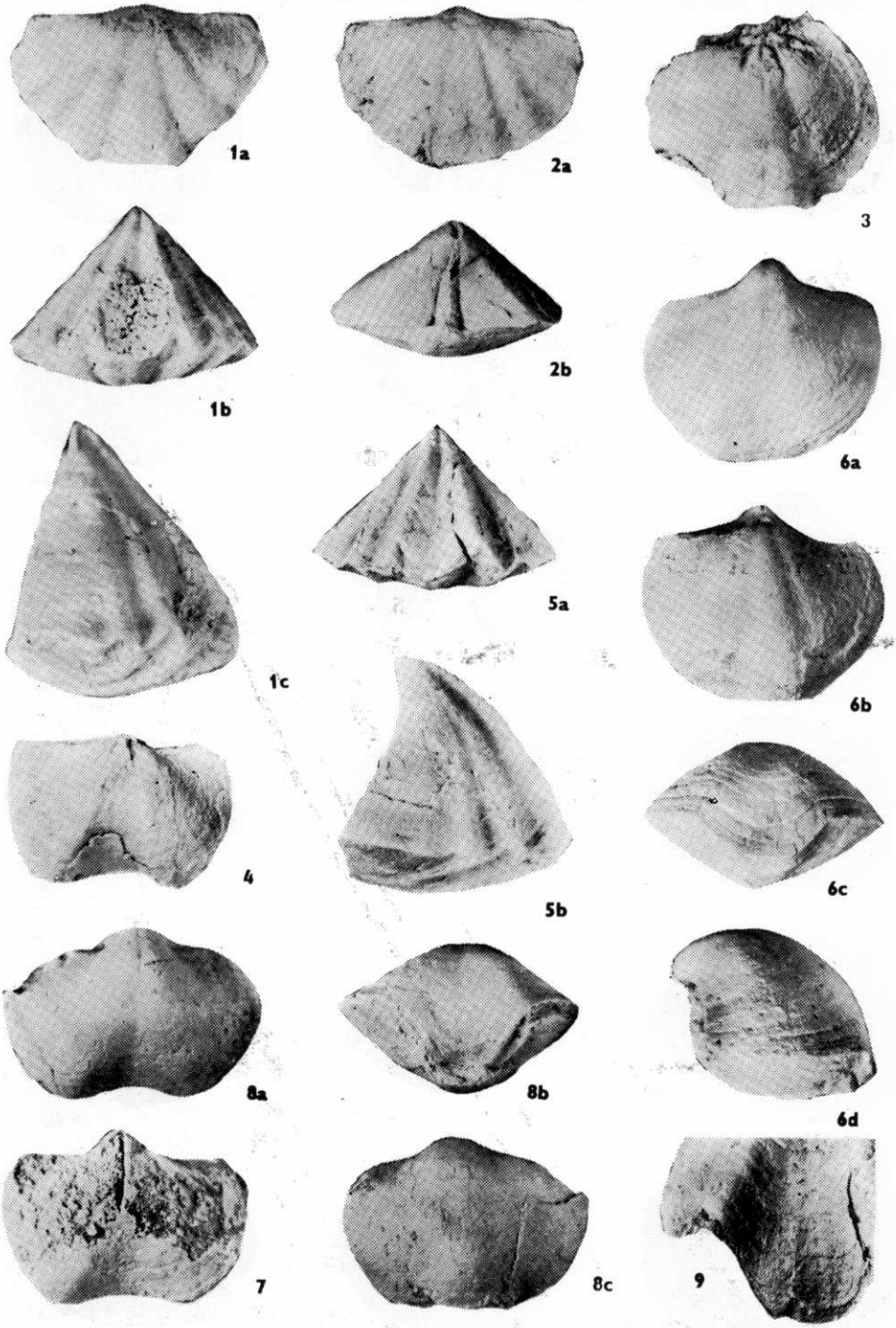
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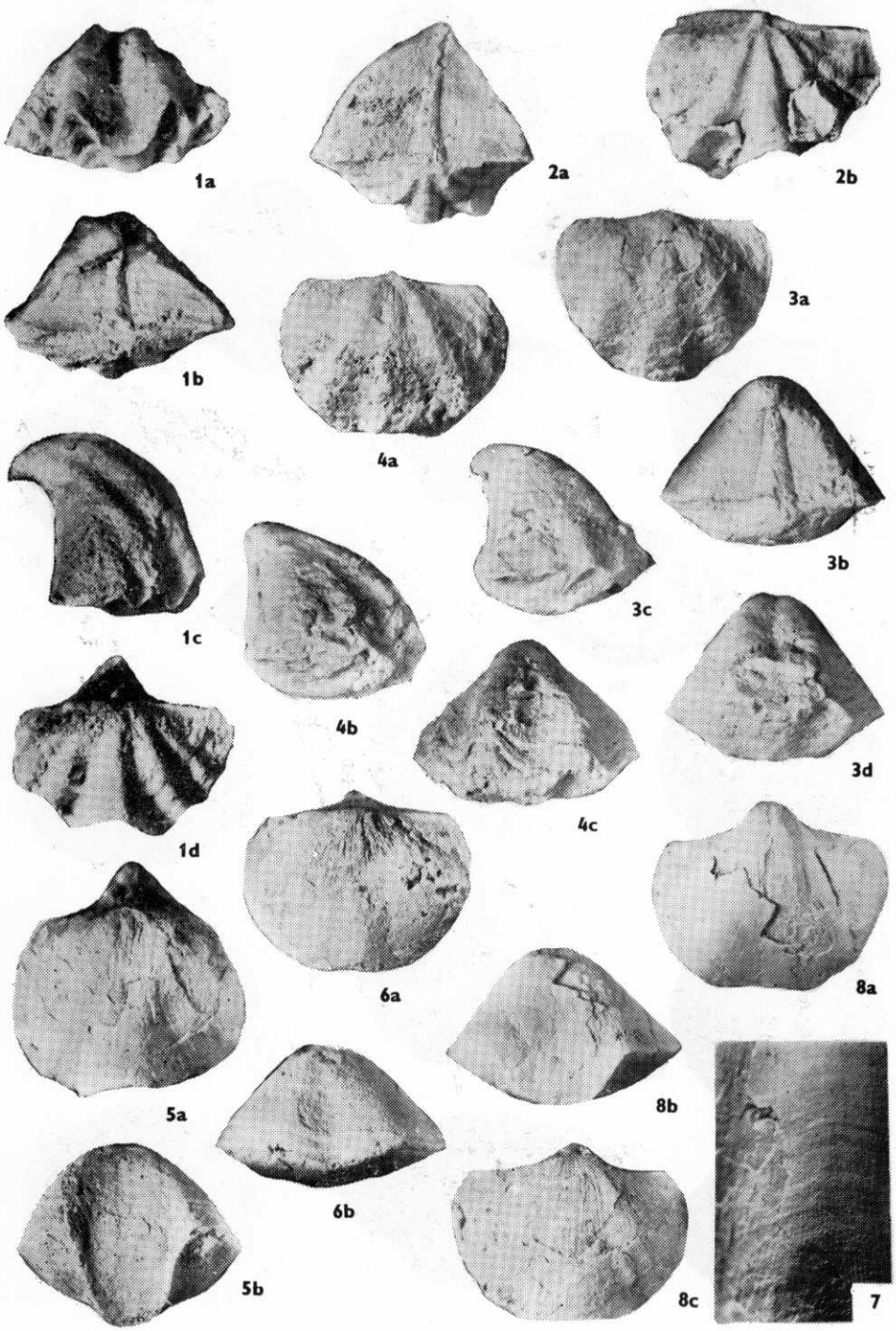
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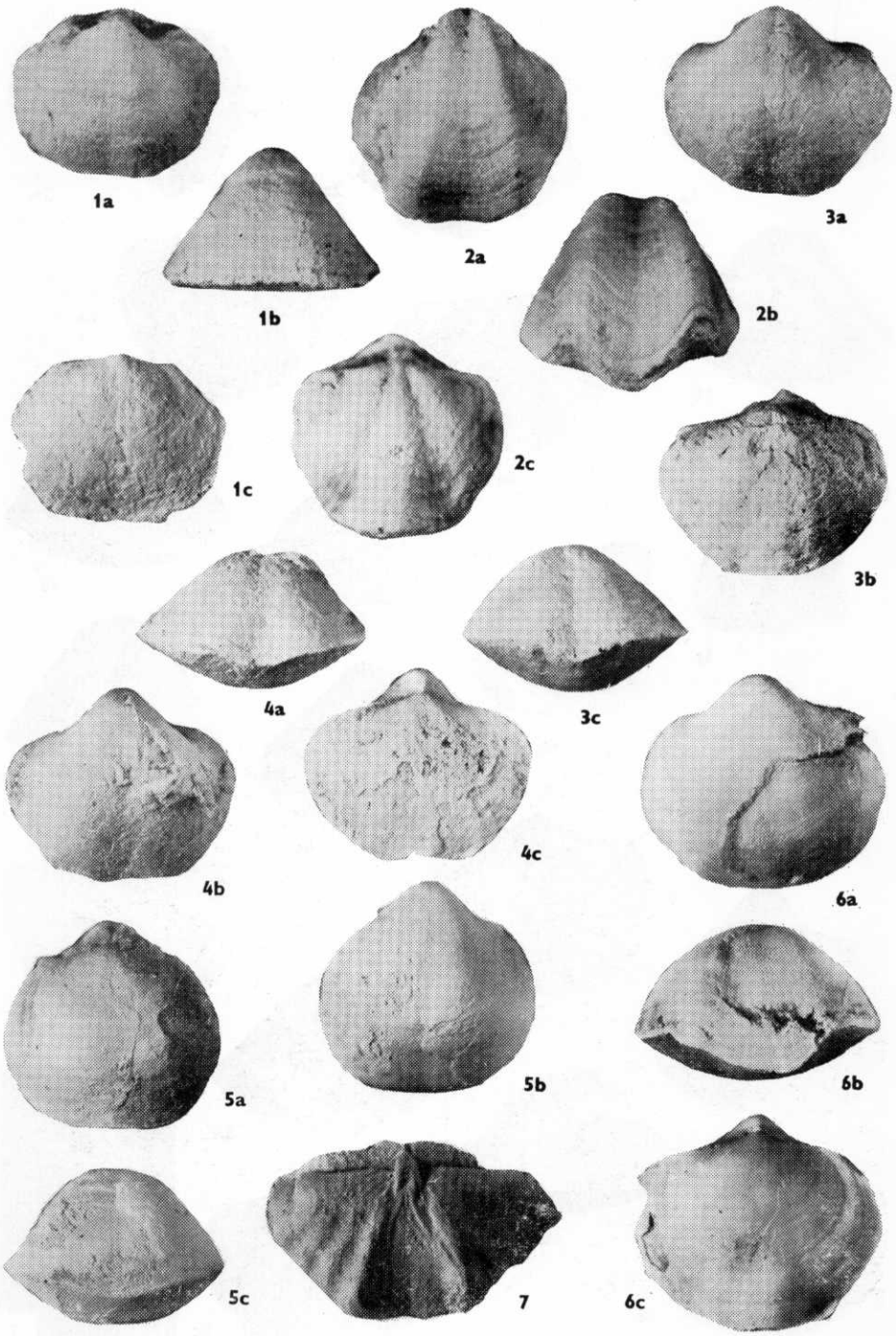
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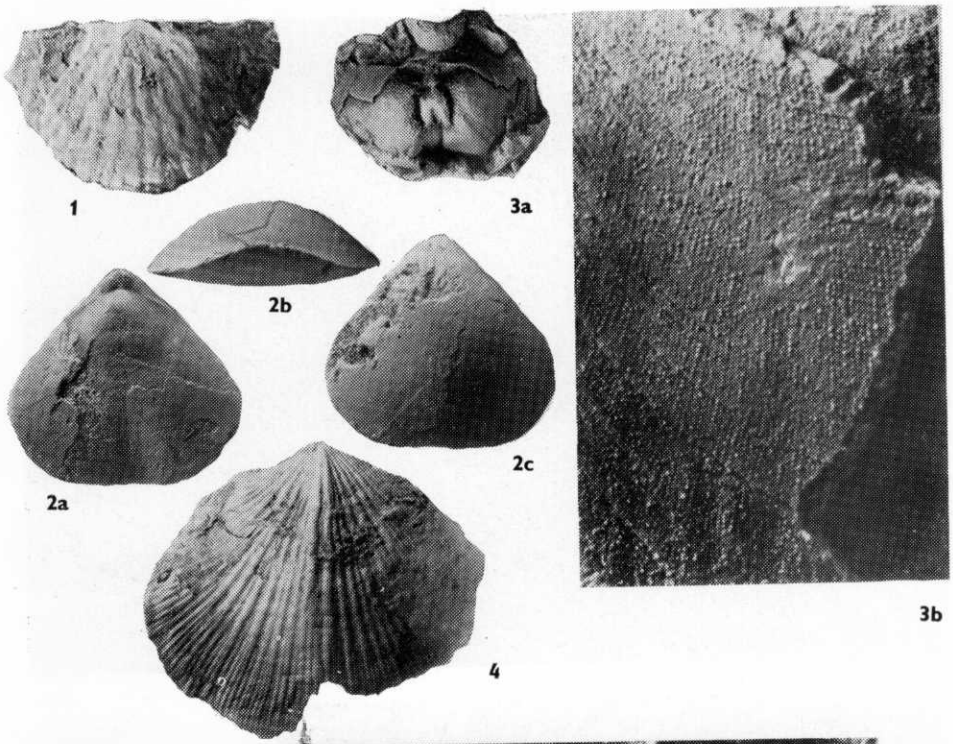
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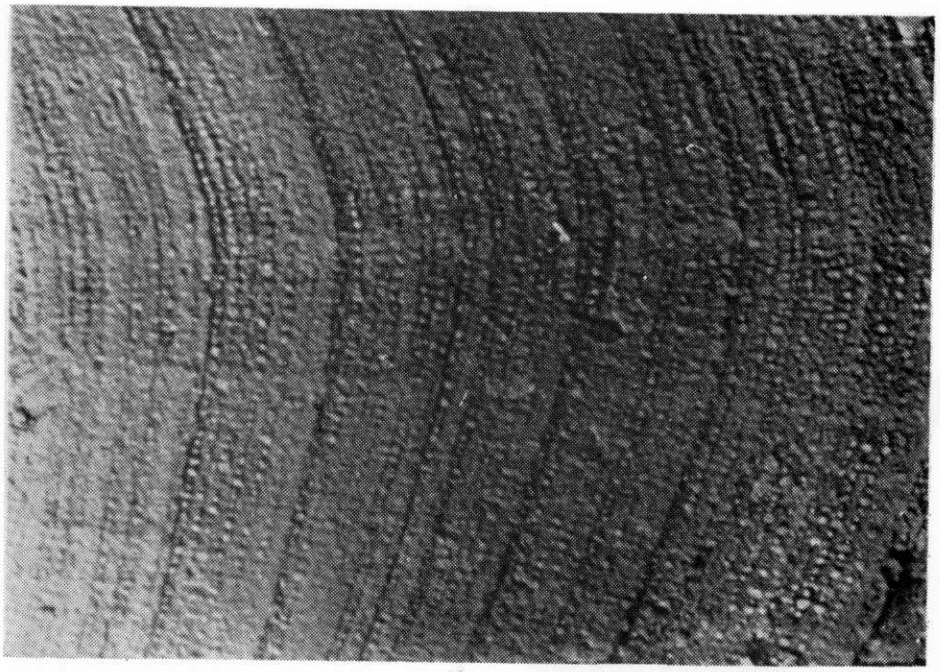
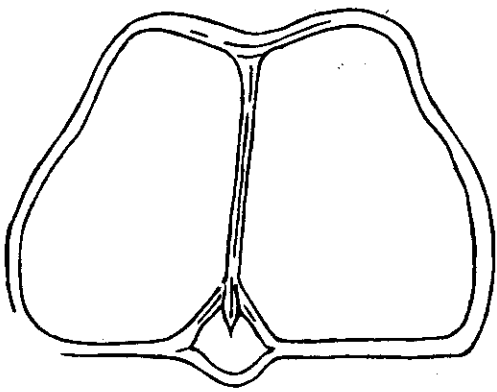


2

1

of all shells examined. Partly decorticated shells exhibit finely and densely endopunctate shell substance.

Interior: Median septum, spondylium, and tichorhinum in pedicle valve (text-fig. 32); interior of brachial valve not examined.



32. *Cyrtina platypleura* sp. n.; pedicle valve, oblique section; ×10

Comparison: Owing to its low costae counting 2 or 3 pairs on the pedicle valve *C. platypleura* recalls *C. kazi* Havl. (Dvorce-Prokop and Zlíchov Limestones); the latter species is even smaller (4.0—6.5 mm wide) and has a slightly convex brachial valve, whereas that of the new species is always moderately vaulted in lateral profile. Moreover, *C. kazi* bears coarse and fairly long spines on its surface, thus differring from all Bohemian species of *Cyrtina* (including *C. platypleura*).

Occurrence: Suchomasty Limestone, localities 5, 8.

Cyrtina aff. *morana* Havlíček, 1956

Pl. XXI, figs. 1, 2

Remarks: By the size and shape of the shell, and by the presence of strong ribs, this species is closely similar to *C. morana* (Zlíchov Limestone) except for having less ribs on the flanks (3 pairs on the brachial valve).

Occurrence: Suchomasty Limestone, locality 5.

Stringocephalacea King, 1850

Stringocephalidae King, 1850

Bornhardtininae Cloud, 1942

Kaplex Ficner & Havlíček, 1975

Kaplex bohemicus (Barrande, 1879)

1986 *Kaplex bohemicus* (Barrande, 1879); Mergl, p. 230, pl. 2, figs. 1—3.

Occurrence: Acanthopyge Limestone, locality 2 (very rare; collected by J. Bouška); Choteč Limestone (Eifelian), Holyně (collected by J. Bouška).

K tisku doporučil M. Siblík

Přeložili autoři

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Explanation of plates

(Pls. III—XXIII: all specimens coated with ammonium chloride; photographed in ÚÚG by B. Matoulková, V. Skala, and H. Vršťalová)

Pl. I

1. Coarse unsorted bioclastic limestone (floatstone) with some larger unrounded bioclasts floating in finer matrix. The Suchomasty Limestone. Natural size.
2. Polished core of the Suchomasty Limestone. Biomicritic limestone with larger bioclasts (mostly crinoid particles floating in micrite matrix. Bioclasts arranged in streaks and lenses. Stromatactis are parallel to the bedding. About natural size.

Both photographs by H. Vršťalová

Pl. II

1. Fine-grained bioclastic crinoidal limestone cut by stylolite seam. The Suchomasty Limestone, Zlatý kůň, ×13.
2. Stromatactis with blade calcite crystals and some bioclasts in the internal sediments. The Suchomasty Limestone, Zlatý kůň. ×21.7.
3. Bioclastic layers of the Acanthopyge Limestone. Fine-grained hash of bioclasts with sparitic cement. Zlatý kůň. ×60.
4. Fine-grained layer of the Acanthopyge Limestone. Consists of microsparite with clots of micrite. Also some microspheres are present. Zlatý kůň. ×61.

All photographs by S. Bártlová

Pl. III

Daleji:na sp.; Suchomasty Limestone
1. Brachial valve; VH 5875a, ×5.5.

Leptaenopyxis irena (H a v l í č e k); Suchomasty Limestone
2. Brachial valve; VH 382, ×2.1.
3. Brachial valve, oblique view showing a trail; VH 2629b, ×2.8.
4. Internal mould of pedicle valve; VH 383, ×2.8.
5. Pedicle valve; L 6663, ×2.5.
6. Pedicle valve, oblique view; VH 2637b, ×2.2.

Areostrophia ares sp. n.; Suchomasty Limestone
7. Brachial valve; VH 2545a, ×4.0.
8. Pedicle valve; VH 2544, ×4.3.

Quasidavidsonia tenuissima (B a r r a n d e); Suchomasty Limestone
9. Dorsal view; VH 495b, ×2.3.
10. Dorsal and ventral views; 495a, ×2.0.

Quasidavidsonia mediocarinata (H a v l í č e k); Acanthopyge Limestone
11. Brachial valve; VH 3327, ×2.1.
12. Brachial valve interior; VH 5247, ×2.3.
13. External mould of pedicle valve; VH 442c, ×3.0.
14. Ventral and dorsal views; VH 442a, ×3.0.
15. Ventral view; VH 442b, ×2.8.

Protoleptostrophia sp.; Suchomasty Limestone
16. Pedicle valve; VH 3890, ×2.7.

Pl. IV

Mamutinetes latipleura sp. n.; Choteč Limestone
1. External mould of brachial valve; VH 2634g, ×5.0.
2. Internal mould of pedicle valve; VH 2634c, ×6.0.

3. Internal mould of brachial valve; VH 2634d, ×4.5.
4. Pedicle valve; VH 2347, ×4.6.

Holynetes cf. *holynensis* Havlíček & Racheboeuf; Suchomasty Limestone

5. Pedicle valve; VH 2635, ×6.0.
6. Pedicle valve; VH 2636b, ×6.0.
7. Brachial valve; VH 2636c, ×14.0.
8. Pedicle valve, ventral and posterior views; L 14568, ×6.0.

Mamutinetes perlatipleura sp. n.; Suchomasty Limestone

9. Pedicle valve; VH 2304a, ×3.5.

Kaplicona fragilis (Barrande); Suchomasty Limestone

10. Pedicle valve; L 6780, ×3.5.

Leptochonetes papyrus Havlíček & Racheboeuf; Suchomasty Limestone

11. Dorsal and ventral views; VH 2305, ×3.5.
12. Shell with marginal spines; VH 2308, ×3.5 and ×10.0
13. Ventral, dorsal, and posterior views; VH 2306, ×3.5.

Pl. V

Pseudosieberella labrusca sp. n.; Suchomasty Limestone

1. Ventral, dorsal, and anterior views; VH 4816a, ×2.5.
2. Ventral, dorsal, and anterior views; VH 4816b, ×2.4.

Plicogypa lukesi sp. n.; Suchomasty Limestone

3. Pedicle valve; VH 4813a, ×2.4.
4. Ventral, dorsal, anterior, and lateral views; VH 4813c, ×1.7.
5. Dorsal, anterior, and ventral views; VH 4813b, ×1.8.
6. Ventral, dorsal, posterior, and lateral views; VH 4813d, ×1.6 and ×1.8.

Pl. VI

Clorinda baccalaria sp. n.; Suchomasty Limestone

1. Ventral, anterior, and dorsal views; VH 4821c, ×2.0.

Lysigypa morosoides sp. n.; Suchomasty Limestone

2. Ventral, dorsal, and anterior views; VH 4817b, ×2.1.

Clorinda robustisella sp. n.; Suchomasty Limestone

3. Ventral, anterior, and dorsal views; VH 4819a, ×2.5.
4. Ventral, dorsal, and anterior views; VH 4819b, ×2.6.

Gypidulina ariadna sp. n.; Suchomasty Limestone

5. Ventral and anterior views; VH 4814a, ×2.0.

Gypidula sp.; Suchomasty Limestone

6. Pedicle valve; VH 4815, ×1.0.

Pl. VII

Clorinda exarmata sp. n.; Suchomasty Limestone

1. Ventral, dorsal and anterior views; VH 4818a, ×3.4.
2. Ventral, dorsal, and anterior views; VH 4818b, ×2.8.

Clorinda acrimona sp. n.; Suchomasty Limestone

3. Anterior, dorsal, and lateral views; VH 4820a, ×2.1.
5. Anterior and dorsal views; VH 4820b, ×2.0.

Clorinda baccalaria sp. n.; Suchomasty Limestone

4. Pedicle valve, anterior and ventral views; VH 4821e, ×2.2 and ×1.6.
6. Transverse section; ×6.7, VH 4827.

Lysigypa morosoides sp. n.; Suchomasty Limestone

7. Internal mould of pedicle valve; VH 4817f, ×2.7.

Pl. VIII

Clorinda strix (Barrande); Acanthopyge Limestone

1. Ventral, dorsal, and anterior views; VH 3319a, ×3.8.
2. Ventral view; VH 5876c, ×3.3.

Corvinopugnax corvinus (Barrande); Suchomasty Limestone

3. Ventral, dorsal, and anterior views; VH 2538f, ×2.4.

Iberirhynchyia nargis (Havlíček); Suchomasty Limestone

4. Ventral and anterior views; VH 249, ×1.5.

Taimyrrhynx rufus sp. n.; Suchomasty Limestone

5. Ventral and anterior views; VH 3329b, ×2.1 and ×2.3.

Tetratomia coalescens sp. n.; Suchomasty Limestone

6. Dorsal, ventral, and anterior views; VH 4157, ×8.1.

Astutorhyncha proserpina (Barrande); Suchomasty Limestone

7. Young shell, ventral and anterior views; VH 2552a, ×1.9.
8. Late adult shell, ventral, anterior, and dorsal views; VH 2551a, ×1.4.

Pl. IX

Kransia aff. *parallelepipeda* (Bronn); Acanthopyge Limestone

1. Ventral and anterior views; VH 3314, ×4.0.

Markitoechia clavula sp. n.; Suchomasty Limestone

2. Anterior, ventral, and dorsal views; VH 3317b, ×5.5.

Septalaria palumbina (Barrande); Suchomasty Limestone

3. Ventral and anterior views; VH 5883, ×2.9.

Monadotoechia monas (Barrande); Suchomasty Limestone

4. Ventral and anterior views; VH 248, ×5.4.
5. Ventral and anterior views; VH 204, ×5.4.

Amissopecten obsolescens (Barrande); Acanthopyge Limestone (= *Atrypa assula* Barrande, 1879, pl. 93, case I, fig. 3)

6. Ventral and anterior views; L 24368, ×3.2.

Amissopecten velox (Barrande); Acanthopyge (fig. 7) and Suchomasty (fig. 8) Limestones

7. Ventral, lateral, dorsal, and anterior views; VH 2554c, ×1.4.
8. Anterior and ventral views; VH 2524e, ×1.5.

Pl. X

Amissopecten obsolescens (Barrande); Acanthopyge Limestone

1. Ventral and anterior views; VH 5854a, ×2.1.

Trigonatrypa baucis (Barrande); Acanthopyge Limestone

2. Ventral and dorsal views; pedicle valve exfoliated to show muscle field; VH 3325c, ×2.8.

Trigonatrypa protobaucis sp. n.; Suchomasty Limestone

3. Dorsal, anterior, ventral, and lateral views; VH 3322b, ×2.5.

Markitoecha omissa Havlíček; Suchomasty Limestone

4. Ventral, dorsal, and anterior views; VH 205, ×4.0.

Trigonatrypa securis (Barrande); Acanthopyge Limestone

5. Ventral and anterior views; pedicle valve exfoliated to show muscle field; L 25317, ×2.5.

Cerberatrypa cerberus sp. n.; Suchomasty Limestone

6. Dorsal, ventral, and anterior views; VH 4165f, ×2.8.

Cerberatrypa dissidens (Barrande); Acanthopyge Limestone

7. Dorsal, anterior, and ventral views; VH 3323a, ×4.5.

Pl. XI

Trigonatrypa securis (Barrande); Acanthopyge Limestone
1. Ventral, dorsal, and anterior views; L 25315, ×2.5.
Trigonatrypa holynensis (Havlíček); Třebotov Limestone
2. Interior of brachial valve; VH 5877a, ×4.7.
Karbous aperinus Havlíček; Suchomasty Limestone
3. Pedicle valve partly exfoliated to show its muscle field; L 22917, ×3.5.
4. Lateral and dorsal views; VH 5878, ×3.2.
5. Lateral, anterior, and ventral views; VH 4949a, ×3.4.
6. Dorsal, ventral, and lateral views; VH 4949b, ×3.0.
Karbous hassiacus (Siehl); Acanthopyge Limestone
7. Dorsal, anterior, ventral, and lateral views; VH 2638, ×3.1.

Pl. XII

Rhynchatrypa thetis (Barrande); Acanthopyge (figs. 1, 3, 4), Suchomasty (fig. 2) and Chýnice (fig. 6) Limestones
1. Ventral, dorsal, and anterior views; VH 2648b, ×2.2.
2. Ventral, dorsal, anterior, and lateral views; VH 2647b, ×2.5.
3. Ventral, dorsal, anterior, and lateral views; VH 2649, ×2.1.
4. Ventral, anterior, and dorsal views; VH 4155d, ×1.9.
6. Posterior part of a shell showing disjunct deltidial plates; VH 3326b, ×3.7.
Trigonatrypa baucis (Barrande); Acanthopyge Limestone
5. Anterior, ventral, and dorsal views; VH 3325b, ×3.2.

Pl. XIII

Karbous truncatus Havlíček; Suchomasty Limestone
1. Ventral, dorsal, anterior, and lateral views; VH 4948a, ×3.9.
2. Ventral, dorsal, and anterior views; VH 4948b, ×3.9.
Radimatrypa zelaria sp. n.; Acanthopyge Limestone
3. Young shell (= *Atrypa assula,* Barrande 1879, pl. 146, case VII, fig. 2), ventral and anterior views; L 24964, ×2.5.
4. Ventral, dorsal, and lateral views; L 25939, ×2.0.
Athyris odolens sp. n.; Suchomasty Limestone
5. Ventral, dorsal, and anterior views; VH 4161b, ×1.7.
6. Dorsal, anterior, and ventral views; VH 4161a, ×2.0.

Pl. XIV

Plectospira leniplicata sp. n.; Suchomasty Limestone
1. Ventral, dorsal, and anterior views; VH 2624a, ×2.8.
2. Ventral, lateral, anterior, and dorsal views; VH 2624b, ×2.8.
3. Ventral, dorsal, and anterior views; VH 2624c, ×3.0.
4. Ventral, anterior, and dorsal views (ribs obscure!); VH 2624d, ×3.0.
Leptathyris deino sp. n.; Acanthopyge (fig. 5) and Suchomasty (fig. 6) Limestones
5. Ventral, lateral, anterior, and dorsal views; VH 2641, ×2.8.
6. Anterior, dorsal, and ventral views; VH 2640, ×2.3.

Pl. XV

Plectospira grochonia sp. n.; Suchomasty Limestone
1. Ventral and dorsal views; VH 2528a, ×4.5.
Plectospira dione sp. n.; Suchomasty Limestone

2. Pedicle valve; VH 2625c, ×3.8.
3. Ventral, lateral, dorsal, and anterior views; VH 2625d, ×3.7.

Merista repellens sp. n.; Suchomasty Limestone

4. Anterior, ventral, and dorsal views; VH 4828b, ×2.1.
5. Dorsal, lateral, anterior, and ventral views; VH 4828c, ×2.8.
6. Anterior, ventral, and lateral views; VH 4828d, ×1.5.

Pl. XVI

Plectospira grochonia sp. n.; Suchomasty Limestone

1. Ventral, lateral, dorsal, and anterior views; VH 2528b, ×4.5.

Merista passer (Barrande); Suchomasty Limestone

2. Anterior, dorsal, and ventral views; VH 4829a, ×3.2.
3. Anterior, ventral, and dorsal views; VH 4829b, ×2.6.
4. Lateral, ventral, anterior, and dorsal views (holotype); L 25287, ×2.3.
5. Lateral, anterior, ventral, and dorsal views; VH 4829c, ×2.1.

Pl. XVII

Hergetatrypa minuta (Siehl); Suchomasty Limestone

1. Ventral and posterior views; VH 3389c, ×3.4.
2. Ventral and posterior views; VH 3389a, ×4.7.
3. Ventral view; VH 3389d, ×3.0.

Amoenospirifer thetidis (Barrande); Suchomasty Limestone

4. Ventral and posterior views; L 25222, ×1.5.
5. Dorsal, lateral, and anterior views; L 25224, ×1.5.

Eoreticularia indifferens (Barrande); Suchomasty Limestone

6. Dorsal, anterior, and ventral views; VH 2440, ×1.5.

Plectospira varioplicata Siehl; Acanthopyge Limestone

7. Incomplete shell, dorsal view; VH 3324, ×3.1.

Fossatrypa granulifera (Barrande); Suchomasty Limestone

8. Shell with subcarinate pedicle valve and sulcate brachial valve, anterior view; L 21573, ×2.1.
10. Dorsal view; VH 3386b, ×2.1.

Carinatina arimaspus (Eichwald); Suchomasty Limestone

9. Posterior, dorsal, and ventral views; VH 4097b, ×2.2.

Pl. XVIII

Amoenospirifer foedus sp. n.; Suchomasty Limestone

1. Ventral, anterior, and dorsal views; VH 2395b, ×1.4.
2. Ventral, dorsal, and anterior views; VH 2395a, ×1.5.
3. Ventral and anterior views; VH 2392a, ×1.1.

Amoenospirifer amoenoides Havlíček; Suchomasty Limestone

4. Ventral, dorsal, and anterior views; VH 2484c, ×2.1.

Amoenospirifer cf. *thetidis* (Barrande); Suchomasty Limestone

5. Ventral and anterior views; VH 172, ×1.6.

Amoenospirifer oenone sp. n.; Suchomasty Limestone

6. Ventral, anterior, and dorsal views; VH 2389c, ×1.6.
7. Ventral and anterior views; VH 2416d, ×1.9.
8. Anterior, dorsal, lateral and ventral views; VH 2389d, ×1.5.

Pl. XIX

Quadrithyris orba Havlíček; Suchomasty Limestone
1. Ventral, dorsal, and anterior views; VH 5880, ×2.6.
Quadrithyrina ivanovae Havlíček; Suchomasty Limestone
2. Dorsal, anterior, and ventral views; VH 170, ×2.1.
Obesaria obesa (Barrande); Acanthopyge Limestone
3. Ventral, dorsal, and anterior views; VH 182, ×1.8.
Quadrithyris sobrina sp. n.; Suchomasty Limestone
4. Dorsal, anterior, and ventral views; VH 2417, ×1.5.
Eoreticularia fraterna (Barrande); Acanthopyga Limestone
5. Ventral, anterior, and dorsal views; VH 5881, ×2.3.
Pinguispirifer infirmus (Barrande); Suchomasty Limestone
6. Anterior and ventral views; VH 5882, ×1.4.
Amoenospirifer cf. *thetidis* (Barrande); Suchomasty Limestone
7. Dorsal view; VH 172, ×1.6.

Pl. XX

Rochtex lissopleura sp. n.; Acanthopyge (fig. 2) and Suchomasty (figs. 1, 5) Limestones
1. Dorsal, anterior, and lateral views; VH 4784b, ×1.8.
2. Dorsal and posterior views; VH 4782a, ×2.1.
5. Anterior and lateral views; VH 4783, ×2.1 and ×3.2.
Pinguispirifer fessus sp. n.; Suchomasty Limestone
3. Internal mould of brachial valve; VH 2397a, ×1.8.
4. Internal mould of pedicle valve; VH 2433b, ×1.3.
6. Ventral, dorsal, anterior, and lateral views; VH 2195a, ×1.7.
9. Ornamentation; VH 2433a, ×2.4.
Bojothyris nikiforovae Havlíček; Acanthopyge Limestone
7. Pedicle valve umbonally exfoliated to show median septum; VH 5879a, ×2.2.
8. Ventral, anterior, and dorsal views; VH 2476e, ×1.9.

Pl. XXI

Cyrtina cf. *morana* Havlíček; Suchomasty Limestone
1. Anterior, posterior, lateral, and dorsal views; VH 3321a, ×3.6.
2. Posterior and dorsal views; VH 3321b, ×2.0.
Cyrtina platypleura sp. n.; Suchomasty Limestone
3. Dorsal, posterior, lateral, and anterior views; VH 3320a, ×3.7.
4. Dorsal, lateral, and anterior views; VH 3320c, ×3.6.
Cingulodermis columbina (Havlíček); Suchomasty (figs. 5, 8) and Acanthopyge (figs. 6, 7) Limestones
5. Dorsal and anterior views; VH 4799, ×2.9.
6. Dorsal, and anterior views; VH 4809, ×2.7.
7. Anterior part of the fold with fine radial striation; ×4.5.
8. Ventral, anterior, and dorsal views; VH 189, ×2.4.

Pl. XXII

Ambocoelia mesodevonica Havlíček; Suchomasty Limestone
1. Ventral, anterior, and dorsal views; VH 716, ×5.2.
Metaplasia nekvasilovae sp. n.; Suchomasty Limestone
2. Ventral, anterior, and dorsal views; VH 4794c, ×6.0.
Alaskospira accedens (Barrande); Suchomasty Limestone

3. Ventral, dorsal, and anterior views; VH 4796b, ×3.2.
4. Anterior, ventral, and dorsal views; VH 4792c, ×3.0.

Quasimartinia lubrica sp. n.; Suchomasty (fig. 5) and Acanthopyge (fig. 6) Limestones

5. Dorsal, ventral, and anterior views; VH 4786a, ×2.4.
6. Ventral, anterior, and dorsal views; VH 4785, ×2.5.

Amoenospirifer oenone sp. n.; Suchomasty Limestone

7. Internal mould of pedicle valve; VH 2190a, ×1.3.

Pl. XXIII

Mamutinetes perlatipleura sp. n.; Suchomasty Limestone

1. Pedicle valve; VH 2304b, ×3.5.

Errhynx sp.; Acanthopyge Limestone

2. Dorsal, anterior, and ventral views; VH 3910, ×4.1.

"Spirifer" extraneus Barrande (according to Havlíček 1959 conspecific with *Obesaria obesa* (Barrande); Acanthopyge Limestone (orig. Barrande 1879, pl. 76, fig. V)

3. Pedicle valve showing muscle field (×1.0) and microornamentation (×12.0).

Carinatina arimaspus (Eichwald); Suchomasty Limestone

4. Pedicle valve; VH 4097a, ×2.2.

Pl. XXIV

Bojothyris nikiforovae Havlíček; Suchomasty Limestone

1. Microornamentation; VH 643, ×30.0.

Eoreticularia fraterna (Barrande); Suchomasty Limestone

2. Microornamentation; VH 638, ×20.0

Both photographs by Jiří Kříž

Sedimentologie, bentická společenstva a ramenonožci suchomastských a akantopygových vápenců (dalej-eifel) koněpruské oblasti

(Résumé anglického textu)

Vladimír Havlíček - Zdeněk Kukal

Předloženo 30. března 1989

Sedimentární textury a složení suchomastských a akantopygových vápenců dokazují, že sedimenty obou jednotek jsou produktem mělkovodního prostředí na karbonátové platformě. V suchomastských vápencích jsou přítomny znaky jak vysokoenergetického, tak i nízkoenergetického prostředí, přičemž hloubka vody nepřesahovala několik desítek metrů. Během sedimentace akantopygových vápenců převládalo mimořádně mělkovodní prostředí, ve kterém na karbonátové platformě dokonce docházelo k ukládání tzv. bahamitů. Společenstva ramenonožců suchomastských a akantopygových vápenců se značně liší od společenstev útesových koněpruských vápenců (prag), protože jsou tvořena převážně hladkými a chabě žebrovanými ramenonožci obvykle se spirálně stočeným ramenním aparátem. Naproti tomu v koněpruských vápencích převládají silně i slabě žebrované schránky. Bentická fauna suchomastských vápenců je přiřazena ke společenstvům *Karbous-Orbitoproetus* a *Orbitoproetus-Scabriscutellum*. Fauna akantopygových vápenců náleží společenstvu *Karbous-Acanthopyge*. V suchomastských a akantopygových vápencích bylo zjištěno 55 rodů artikulárních ramenonožců; z nich jsou považovánv za nové *Mamutinetes (Chonetacea), Lysigypa (Gypidulacea), Trigonatrypa, Cerberatrypa, Radimatrypa (Atrypacea)* a *Rochtex (Suessiacea)*. Kromě toho bylo popsáno 30 nových druhů a jedna nová čeleď (*Bojothyridae*).

Седиментология, бентические сообщества и плеченогие сухомастских (далейский ярус) и акантопиговых (эйфель) известняков в окрестностях с. Конепрусы (Чехословакия)

Осадочные текстуры и состав сухомастских и акантопиговых известняков доказывают, что осадочные породы обоих подразделений являются продуктом мелководной среды на карбонатной платформе. В сухомастских известняках наблюдаются признаки как высокоэнергетической, так и низкоэнергетической среды, причем глубина воды

не превышала нескольких десятков метров. В течение отложения акантопиговых известняков преобладала чрезвычайно мелководная среда, в которой на карбонатной платформе отлагались даже т. наз. багамиты. Сообщества плеченогих сухомастских и акантопиговых известняков значительно отличаются от сообществ рифовых конепрусских известняков (пражский ярус), так как они состоят из преимущественно гладких или слабогребенчатых створок плеченогих со спирально свернутым брахидиумом, а наоборот, в конепрусских известняках преобладают сильно- и тонкогребенчатые раковины. Бентическая фауна сухомастских известняков относится к сообществам Karbous — Orbitoproetus и Orbitoproetus — Scabriscutellum, а фауна акантопиговых известняков — к сообществу Karbous — Acanthopyge. В сухомастских и акантопиговых известняках было определено 55 родов замковых плеченогих, из которых новыми считаются следующие: Mamutinetes (Chonetecea), Lysigypa (Gypidulacea), Trigonatrypa, Cerberatrypa, Radimatrypa (Atrypacea) и Rochtex (Suessiacea). Кроме того описано 30 новых видов и одно новое семейство (Bojothyridae)

Přeložil A. Kříž

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