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## SILURIAN TABULATA FROM NORTH-EAST POLAND

*Abstract.* — The results are presented of a study of the Tabulata corals from the profile of borehole Widowo, in the vicinity of Bielsk Podlaski. Fourteen species assigned to 7 genera described in the present paper (3 species are new) indicate the Wenlockian age.

## INTRODUCTION

The Silurian deposits have first been found in the Widowo borehole in 1972. A preliminary stratigraphy of the Silurian from that core has been worked out by E. Tomczykowa (oral information) on the basis of a trilobite, brachiopods and graptolites. The Tabulata, described in the present paper, indicate the Wenlockian age.

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## DISTRIBUTION OF TABULATA IN THE SILURIAN OF POLAND

The Silurian basin in Poland occupied a large area, probably representing the eastern extension of the north-European basin (Tomczyk, 1962). It was much deeper and wider than the Ordovician one, especially in its central and north-west part. The Silurian deposits in north-east Poland, with regard to the lithofacies and the distribution of the zones of a shallower and deeper neritic belt, are connected with the East European Platform, with the Silurian of the Baltic countries and with that of Sweden (Island of Gotland and Scania area). They show some similarity to the

Silurian of the Volhynia and Podolia areas and a strong similarity to that of the Holy Cross Mts (Góry Świętokrzyskie) in Poland.

The Silurian deposits of Poland are mainly argillaceous and contain graptolites. In the deposits of a shallower sea, among which limestone intercalations appear, the common is a mixed biofacies which contains graptolites, trilobites, brachiopods, pelecypods and more rarely corals, gigantostracans, crinoids, bryozoans and ostracods.

The Silurian deposits of the Holy Cross Mts are well developed. The Lower Silurian consists mainly of siliceous and argillaceous shales with graptolites. The Upper Silurian consists of diastrophic, greywacke-shaly deposits, that have been termed Wydryszów Beds or Niewachlów greywackes. The higher members are the Rzepin Beds, which sometimes contain limestone lenses and intercalations. In the uppermost Silurian, the graptolites gradually disappear, and brachiopods, pelecypods, trilobites, etc. predominate there.

The Rzepin Beds with corals occur in the Łężyce-Belcz section, situated about 7 km north-west of Opatów. A very rich fauna was described there by Tomczykowa (1962). On the basis of brachiopods and trilobites she assigned the deposits mentioned above to the lower Rzepin Beds, corresponding to the Ludlovian (Tomczyk, 1970). The Rugose corals from the Łężyce-Belcz section have been described by Rózkowska (1962) who found the Upper Silurian species in these beds. Rózkowska found that species of *Rugosa*, occurring in the Łężyce-Belcz section were similar to those from Sweden (Island of Gotland) as well as, to a certain extent, to the species from Skala in Podolia (USSR). The Tabulata from the Łężyce-Belcz section have been described by Stasińska (1970). They are also Upper Silurian in age. The Tabulata from above mentioned section are also known from the Wenlockian and Ludlovian of Estonia, Sweden (Island of Gotland) and Llandoveryian of Norway.

The coral fauna of that locality arrived probably from the north and developed only during the Ludlovian when conditions were favourable to its development and which resulted from the shallow-water zone connected with the coastal line and hard bottom. The proper biocenosis consists of delicate skeletons of corals and bryozoans which are undoubtedly preserved in situ (no traces of transportation and damage).

Our present knowledge of the Silurian corals apart from the Holy Cross Mts has been expanded by borehole Widowo drilled in north-east Poland in the vicinity of Bielsk Podlaski in 1972 (Text-fig. 1). Over the extensive area of north-east Poland, Silurian deposits lie horizontally and together with the younger and older Palaeozoic sequences form a platform cover.

The carbonate facies dominates in the north, within the marginal zone of the Baltic Shield, extending farther along the Eastern European Platform (Text-fig. 1). The neritic zone represented by marly-limy deposits

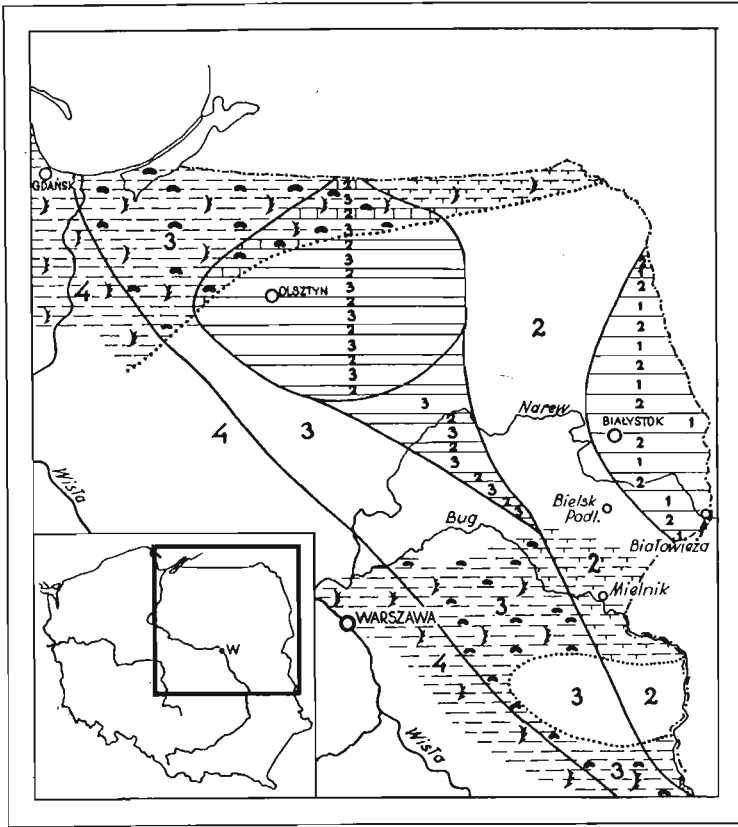


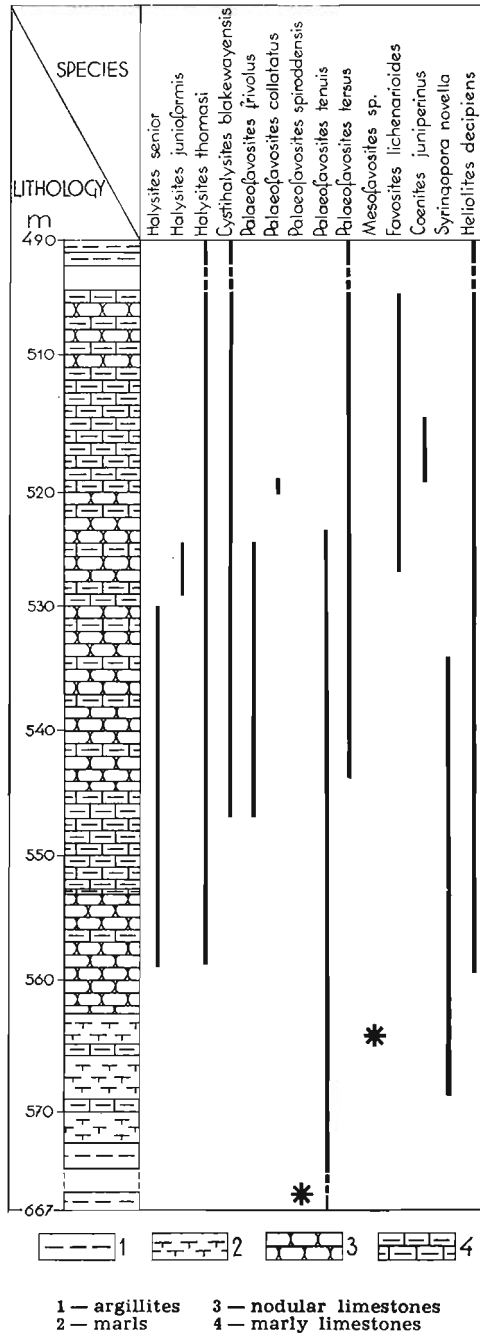
Fig. 1. Extent of the Early Silurian (Llandoveryan-Wenlockian) facies in N-E Poland (after Tomczykowa, 1974, tab. 12). 1 Accumulation flats with lakes and marshes. 2 Shallow part of shelf. 3 Deep part of shelf. 4 Bathial zone.

surrounded the Eastern European Platform, through the Bug depression, joining the neritic zone of Volhynia and Podolia. The Silurian sediments with corals were unknown so far in the north-eastern area. The borehole at Widowo has pierced them for the first time in 1972. The Tabulata and Heliolitoidea (*Heliolites decipiens* M'Coy) described in the present paper come from Widowo (Table 1).

The Silurian sediments, 225 m thick, in the vicinity of Widowo are not metamorphosed and their fossils are satisfactorily preserved. They are frequently found in different horizons, which permits the precise biostratigraphical subdivision. The stratigraphy of the Widowo profile is not elaborated yet. A preliminary study according to an oral information by E. Tomczykowa was done on the basis of a very abundant trilobite, brachiopod and graptolite fauna. The Silurian sediments at Widowo are represented by marly claystones, marls, marly limestones and limestones.

Table 1

Occurrence of Tabulata and Heliolitoidea in the boring Widow.



Claystone series (710—572 m). — These are marly claystones, grey with interbeds of light-grey limestones, somewhat nodular, detrital or oolitic and marls. Abundant fauna is well preserved. It consists of trilobites, brachiopods, crinoids, gastropods, tentaculids, cephalopods and pelceypods.

Corals occur at depths of 701.5—572 m. These are solitary Rugosa and very rare Tabulata. *Palaeofavosites spiroddensis* Stasińska was stated in a limestone interbed at a depth of 607.40 m. It is a coarse detrital rock with crinoidal stem fragments. *P. tenuis* Sokolov also appears at the same depths.

Limestone series (572—485 m). — Older part 572—544.9 m) consists of grey, marly detrital limestones intercalated with compact, detrital ones. Faunal remains are in abundance, in many sites they occur in great masses. These are: brachiopods, trilobites, less frequently ostracods, bryozoans, tentaculids and crinoids. Rugosa are solitary forms. Among the tabulates there occur: *Halysites senior* Klaamann, *H. crassus* sp.n., *Cystihalysites blakewayensis* Sutton, *Palaeofavosites frivolus* (Klaamann), *P. tenuis* Sokolov, *Syringopora novella* Klaamann. Out of Heliolitoidea there appears *Heliolites decipiens* M'Coy.

Sediments at depth 544.9—485 m consists of brownish, grey and light grey limestones almost cream or greenish detrital and marly. Faunal remains are abundant. Most common are brachiopods and trilobites as well as bryozoans, crinoids, ostracods, tentaculids, scolecodonts and graptolites. Tetracoralla are represented mainly by solitary forms, Stromatoporoidea are present. Tabulate corals are frequent, the following forms were noted: *Halysites crassus* sp.n., *H. senior* Klaamann, *H. junioformis* sp.n., *Cystihalysites blakewayensis* Sutton, *Palaeofavosites frivolus* (Klaamann), *P. collatatus* Klaamann, *P. tenuis* Sokolov, *P. tersus* Klaamann, *Favosites lichenarioides* Sokolov, *Cladopora perrara* Klaamann, *Coenites juniperinus* Eichwald, *Syringopora novella* Klaamann. Out of Heliolitoidea there occurs *Heliolites decipiens*.

The age of the claystone series is not clear. *Palaeofavosites spiroddensis* is known from the Llandoverian of Norway, whereas *P. tenuis* previously described from the Jaani Stage in Estonia actually belongs to species excluded from those occurring in this horizon because it was not found in situ. It passes upwards and occurs together with species characteristic for the Wenlockian of Estonia, which has been proved by a graptolite *Testograptus testis* (Barrande).

The limestone series at Widowo, as it may be reckoned from the Tabulata and *Heliolites decipiens* occurrences, is of Wenlockian age. The assemblage is characteristic entirely for this stage. (Table 2).

The older part of the limestone series (572—544.9 m) corresponds to the Jaani Stage of Estonia with the characteristic *Halysites senior* Klaamann. *Syringopora novella* and *Heliolites decipiens* occur there as well. They are frequent in the Jaani Stage in Estonia.

Table 2

Distribution of Tabulata and Heliolitoidea in the Wenlockian	USSR		England	Nor- way	Sweden Island of Gotland	North Ame- rica
	Estonia	Podolia				
<i>Halysites senior</i> Klaamann	+					
<i>H. thomasi</i> sp. n.			+			
<i>Cystihalysites blakewayensis</i> Sutton			+			
<i>Palaeofavosites collatatus</i> Klaamann	+				+	
<i>P. frivolus</i> (Klaamann)	+					
<i>P. tersus</i> Klaamann	+					
<i>Cladopora perrara</i> Klaamann	+					
<i>Coenites juniperinus</i> Eichwald	+		+	+		+
<i>Syringopora novella</i> Klaamann	+	+			+	
<i>Heliolites decipiens</i> (M'Coy)	+					

The sediments at depth of 544.9—485 m correspond to the sediments of Estonia classified to the Jaagarahu Stage. These are shallow-marine sediments with bioherms and a tabulate assemblage of the *Coenites juniperinus* zone. The following species characteristic for this horizon occur at Widowo: *C. juniperinus* Eichwald, *Palaeofavosites collatatus* Sokolov, *P. frivolus* (Klaamann) and *P. tersus* Klaamann. Beside there occurs *Halysites junioformis* sp.n. which is very similar to *H. junior* Klaamann, which is also characteristic in the Jaagarahu Stage. *Heliolites decipiens* still occurs within this series.

In this series, there are no typical representatives of the Ludlovian, the main component of which is *Favosites* of the *F. forbesi* type. There are no *Parastriatopora commutabilis* Klaamann, *Thecia swinderniana* (Goldfuss) and *Laceripora cribrosa* Eichwald which are typical in the Ludlovian. On the other hand, there occur the representatives of genera *Palaeofavosites*, *Mesofavosites*, *Multisolenia*, *Halysites* and *Heliolites decipiens* which do not occur in the Ludlovian. Disappearance of the above genera at the end of the Wenlockian in Estonia was connected with a change in the environment namely from a shallow to more deep facies less favourable for corals. Most probably such a change had taken place in the Wenlockian of Poland.

## DESCRIPTIONS

Order *Halysitida* Sokolov, 1962Family *Halysitidae* Milne-Edwards & Haime, 1850Subfamily *Halysitinae* Milne-Edwards & Haime, 1850Genus *Halysites* Fischer v. Waldheim, 1813*Halysites crassus* sp.n.

(Pl. XVIII, Figs 1, 2)

*Type specimen*: IG 1325.II.1.*Type horizon*: Wenlockian.*Type locality*: Poland, Widowo, near Bielsk Podlaski.*Derivation of the name*: *Lat. crassus* — thick, because of very thick corallite walls.*Diagnosis*. — Corallites oval in cross-section, their longer diameter ranging 1.3—2 mm, shorter 1.2—1.3 mm. Walls very thick, ranging up to 0.5 mm. Mesocorallites 0.3 mm long, 0.1 mm wide. Septal spines short.*Material*. — Fragments of two colonies (IG 1325.II.1—2).*Description*. — Preserved fragments of colonies small. Corallites oval in cross-section, their longer diameters ranging 1.3—2.0 mm; shorter diameters 1.2—1.3 mm. Walls exceptionally thick, ranging 0.4—0.5 mm. Intercorallite walls well differentiated and thicker than side walls, with mesocorallite 0.3 mm long and 0.1 mm wide, sometimes invisible. Epitheca thick. Septal spines, only occasionally traceable because of poor preservation. Tabulae rare.*Remarks*. — The investigated species is similar to *Catenipora crassa* Stasińska from the Island of Gotland, but differs from the latter in having mesocorallites. Intercorallite walls of *C. crassus* consist of two parts with a slit between them, but never with any distinct mesocorallite.*Halysites junioformis* sp.n.

(Pl. XVIII, Fig. 3a, b)

*Type specimen*: IG 1325.II.3, Pl. XVIII, Fig. 3a,b.*Type horizon*: Wenlockian.*Type locality*: Poland, Widowo, near Bielsk Podlaski.*Derivation of the name*: *junioformis* — similar to *H. junior* Klaamann.*Diagnosis*. — Lacunae elongate, polygonal, with sides composed of 1—6 corallites. Corallites oval in cross-section, with longer diameter 1.3—1.6 mm and shorter 1.2—1.4 mm. Walls 0.2—0.3 mm thick. Mesocorallites slit-like, 0.3—0.5 mm long, 0.1—0.3 mm wide. Mesocorallite walls 0.1 mm thick. No septal spines.*Material*. — Fragments of seven colonies (IG 1325.II.3—9).*Description*. — Fragments of colonies small. Lacunae elongate, with sides composed of 1—6 corallites. In cross-section corallites oval, near circular, with longer diameters ranging 1.3—1.6 mm, shorter 1.2—1.4 mm. Walls 0.2—0.3 mm thick. Epitheca thick. Fine structure well preserved.

Mesocorallites slit-like, 0.3—0.5 mm long, 0.1—0.3 mm wide. Mesocorallite walls 0.1 mm thick. Tabulae horizontal, concave, uneven, 0.2—0.5 mm apart. In mesocorallites tabulae horizontal, 0.1—0.2 mm apart. No septal spines.

*Remarks.* — *Halysites junioformis* sp.n. shows many points of resemblance to *H. junior* Klaamann having a similar shape of corallites and the septal spines lacking, but a great difference exist between dimensions of respective corallites and wall thickness.

*Halysites senior* Klaamann, 1961

(Pl. XVIII, Figs 4, 5)

1961. *Halysites senior* Klaamann; E. Klaamann, p. 93, Pl. 11, Figs 3—5.

1966. *Halysites senior* Klaamann; E. R. Klaamann p. 62, Pl. 19, Figs 2, 3.

1967. *Halysites senior* Klaamann; A. Stasińska, p. 57, Pl. 9, Fig. 2a, b.

*Material.* — Fragments of two colonies (IG 1325.II.10—11).

*Remarks.* — The specimen of *H. senior* here described differs from those from the Wenlockian of Estonia and the Island of Gotland only in having shorter mesocorallites.

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Wenlockian, Upper Jaani Stage. Sweden: Island of Gotland, Silurian.

*Halysites thomasi* sp.n.

(Pl. XIX, Figs 1, 2)

*Type specimen:* IG 1325.II.12; Pl. XIX, Fig. 1.

*Type horizon:* Wenlockian.

*Type locality:* Poland, Widowo, near Bielsk Podlaski.

*Derivation of the name:* A species dedicated to the late H. Dighton Thomas.

*Diagnosis.* — After Thomas & Smith., 1954.

*Material.* — Six fragments of colony (IG 1325.II.12—17).

*Description.* — Colonies small. Lacunae elongate, composed of numerous corallites. In cross-section, corallites oval, sometimes circular, with longer diameter 1.7—2.0 mm, mostly 2.2 mm. Shorter diameters ranging 1.4—2.0 mm. Walls 0.2—0.3 mm thick. Mesocorallites rectangular, 0.3—0.5 mm long, 0.1—0.2 mm wide. Tabulae horizontal, uneven, 0.2—0.8 mm apart. In mesocorallites, tabulae 0.1—0.4 mm apart. Septal spines long, with broad basis, directed slightly upwards. On the circumference of corallite 12 septal spines present.

*Remarks.* — The colonies here described are very similar to *Halysites* sp. from England (Thomas & Smith, 1954). Thomas and Smith presented a specific diagnosis without name nor choosing the holotype. According to them the specimen described under B.M. 8224 is the most characteristic one. The specimens from Poland are most similar to that specimen.



They show the same dimensions and the same general aspect of the colonies.

*Distribution.* — Poland: Widowo, Wenlockian. England: Wenlockian Limestone, Dudley, Worcestershire.

Genus *Cystihalysites* Tchernychev, 1941  
*Cystihalysites blakewayensis* Sutton, 1964  
 (Pl. XIX, Fig. 3a, b)

1964. *Cystihalysites blakewayensis* Sutton; I. D. Sutton, p. 456, Pl. 74, Figs 3—7.

1967. *Cystihalysites blakewayensis* Sutton; A. Stasińska, p. 59, Pl. 9, Fig. 4a-b.

*Material.* — Six fragments of colonies (IG 1325.II.18—23).

*Remarks.* — The specimen of *Cystihalysites blakewayensis* here described is similar to those from Wenlock of England and from erratic boulder of Poland. There exist some small differences between the specimen of *C. blakewayensis* from Poland (Widowo) and England, the latter having larger diameters of corallites and thicker walls.

*Distribution.* — Poland: Widowo, Wenlockian. England: Wenlock Edge, Shropshire, Wenlockian. Norway: Malmøy, Wenlockian, Series 7<sub>b</sub>, Malmö, Series 7<sub>a3</sub>.

Order **Favositida** Sokolov, 1962  
 Suborder **Favositina** Sokolov, 1950  
 Family **Favositidae** Dana, 1846  
 Subfamily **Palaeofavositinae** Sokolov, 1950  
 Genus *Palaeofavosites* Twenhofel, 1914  
*Palaeofavosites collatatus* Klaamann, 1914

1961. *Palaeofavosites collatatus* Klaamann; E. Klaamann, p. 75, Pl. 4, Figs 1, 2; Pl. 5, Figs 1, 2.

1964. *Palaeofavosites collatatus* Klaamann; E. R. Klaamann, p. 39, Pl. 11, Figs 3—5.

*Material.* — Fragment of a colony (IG 1325.II.24).

*Remarks.* — The Polish specimen is close to those of the same species from Estonia.

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Wenlockian, Jaagarahu Stage.

*Palaeofavosites frivolus* (Klaamann, 1961)  
 (Pl. XX, Fig. 1a, b)

1961. *Multisolenia? frivola* Klaamann; E. Klaamann, p. 78, Pl. 6, Figs 1—3.

*Diagnosis.* — Corallites polygonal, with angles often rounded. Their diameters ranging 1.0—1.75 mm. Angular pores 0.2—0.4 mm, spaced

0.15—0.2 mm apart. Tabulae spaced 0.2—0.3 and 0.5—1.0 mm apart. Septal spines arranged in zones, long, rarely preserved.

*Material.* — One colony (IG 1325.II.25).

*Description.* — Colony small, semicircular. Corallites polygonal, with angles often rounded in cross-section, sometimes 1.7 mm in diameter. Walls 0.05—1.0 mm thick, intercorallite suture clearly visible. Angular pores abundant, 0.15—0.4 mm in diameter or slightly more. Pores spaced 0.05 mm, sometimes 0.2 mm apart. Tabulae thin, horizontal, uneven, arranged in zones of different density, spaced 0.2—0.3 mm and 0.5—0.8 mm apart. Septal spines numerous, thin, long and directed upwards, sometimes rarely preserved.

*Remarks.* — *Palaeofavosites frivolus* described above, does not exhibit any differences from *Multisolenia? frivola* Klaamann. Numerous angular pores, large and densely spaced, differ it from solenias of genus *Multisolenia*; they are similar to pores of genus *Palaeofavosites*.

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Wenlockian, Upper Jaagarahu Stage.

*Palaeofavosites spiroddensis* Stasińska, 1967

1967. *Palaeofavosites spiroddensis* Stasińska; A. Stasińska, p. 72, Pl. 15, Fig. 4a, c.

*Material.* — Fragment of a colony (IG 1325.II.28).

*Remarks.* — There are no differences between the specimens of *P. spiroddensis* from Poland and those from Norway.

*Distribution.* — Poland: Widowo, Wenlockian. Norway: Spirodden, Asker, Llandoverly, Substage 6c .

*Palaeofavosites tenuis* Sokolov, 1952.

1952. *Palaeofavosites tenuis* Sokolov; B. S. Sokolov, p. 16, Pl. 5, Figs 3—5.

1964. *Palaeofavosites tenuis* Sokolov; E. R. Klaamann, p. 38.

*Material.* — Fragments of 6 colonies (IG 1325.II.29—34).

*Remarks.* — The specimens from Poland and Estonia are almost identical. However, the tabulae of the Polish forms are arranged in zones.

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Wenlockian, Jaagarahu Stage?

*Palaeofavosites tersus* Klaamann, 1961

(Pl. XXI, Fig. 1)

1961b. *Palaeofavosites tersus* Klaamann; E. R. Klaamann, p. 73, Pl. 3, Figs 3—4.

1964. *Palaeofavosites tersus* Klaamann; E. R. Klaamann, p. 39, Pl. 10, Figs 3—4.

1967. *Palaeofavosites tersus* Klaamann; A. Stasińska, p. 72, Pl. 17, Fig. 1a, b.

*Material.* — Fragments of 10 colonies (IG 1325.II.35—44).

*Remarks.* — The colonies from Widowo do not exhibit any differences from *P. tersus* of Estonia and Sweden.

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Wenlockian, Jaagarahu Stage. Sweden: Island of Gorland, Lindeklint.

Genus *Mesofavosites* Sokolov, 1971

*Mesofavosites* sp.

*Material.* — Fragment of a colony (IG 1325.II.45).

*Remarks.* — *Mesofavosites* sp. is to some extent similar to *M. validus* Klaamann, known in Estonia (Upper Llandovery) and in Norway (Wenlockian, Stage 6—8b).

Genus *Favosites* Lamarck, 1816

*Favosites lichenarioides* Sokolov, 1952

1952a. *Favosites lichenarioides* Sokolov; B. S. Sokolov, p. 39, Pl. 14, Figs 3—4.

1964. *Favosites lichenarioides* Sokolov; E. R. Klaamann, p. 72.

1967. *Favosites lichenarioides* Sokolov; A. Stasińska, p. 81, Pl. 26, Fig. 2a,b.

*Material.* — Fragments of 4 colonies (IG 1325.II.58—61).

*Remarks.* — The specimen from Widowo is most close to the colony of this species from Estonia and Island of Gotland.

*Distribution.* — Poland: Wenlockian, Widowo. Sweden: Island of Gotland, Korpklint, Irevik, Wenlockian. Estonia: Silurian.

Suborder **Thamnoporine** Sokolov, 1950

Family **Thamnoporidae** Sokolov, 1950

Genus *Cladopora* Hall, 1851

*Cladopora perrara* Klaamann, 1964

(Pl. XXI, Fig. 3)

1964. *Cladopora(?) perrara* Klaamann; E. R. Klaamann, p. 84, Pl. 22, Figs 4, 5.

*Material.* — Fragments of 3 colonies (IG 1325.II.46—48).

*Remarks.* — The investigated colony is closest to that of the same species described from Estonia. It is assigned to the genus *Cladopora* because of the septa in form of spines.

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Wenlockian, Upper Jaagarahu Stage.

Suborder **Alveolites** Sokolov, 1950  
 Family **Coenitidae** Sardeson, 1896  
 Subfamily **Coenitinae** Sardeson, 1896

The subfamily Coenitinae is represented in the Silurian deposits of the Bielsk Podlaski area by a single species, *Coenites juniperinus*, which is very abundant at depths of 520—515 m. Until quite lately this species was an index form of the Jaagarahu Stage in Estonia. Recent investigations, however, have shown (dr Klaamann's oral information) that it is connected with the Wenlockian recifal facies, hence it is not limited to the Jaagarahu Stage.

Genus *Coenites* Eichwald, 1829  
*Coenites juniperinus* Eichwald, 1829  
 (Pl. XIX, Fig. 4a, b)

1967. *Coenites juniperinus* Eichwald; A. Stasińska, p. 92 (here oldest synonymy).

*Material.* — Fragments of 5 colonies (IG 1325.II.49—53).

*Remarks.* — The specimens described do not differ from colonies of the same species from Estonia and Norway.

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Upper Wenlockian. England: Wenlockian. Norway: Wenlockian, Series 8. North America: Wenlockian.

Order **Syringoporida** Sokolov, 1962  
 Family **Syringoporidae** Nicholson, 1879  
 Genus *Syringopora* Goldfuss, 1826

The genus *Syringopora* is seldom found in the Silurian of Poland. Three species were found at Widowo, namely *S. novella* Klaamann, *S. vesita* Tchudinova and *S. sp.* One species, *S. schmidtii*, occurs in the Ludlovian of the Łężyce—Bełcz section (Stasińska, 1970).

The genus *Syringopora* Goldfuss is poorly known. Recent studies by Tchudinova (1971) have shown that the diameters of corallites, connecting tubes and axial tubes and the septal apparatus are constant features, and are of great taxonomic importance. Such features as wall thickness of corallites, spacing of connecting tubes and their length, spacing of tabulae and their character are strongly variable, particularly so under changes in the environment.

These observations are confirmed in the material from Poland. In particular *Syringopora novella* which occurs at Widowo shows such characters. In the colonies found in claystones (569 m) which have lived in

a neritic shoal but somewhat distanced from shore that devoid of thick detrital material, the corallites are broadly spaced from 0.5 to 3.2 mm. Larger spaces are commoner. On the other hand, in the younger detrital limestone facies (depth 559 m) the colonies are more compact and the spacing of the corallites is smaller, from 0.75 to 2.0 mm and smaller distances between the corallites prevail.

The corallite diameters are constant features in the colonies of both environments, particularly so among the adult forms, and attain 2 mm never exceeding this value. The diameters of axial tubes do not exceed 0.5 mm and are also constant features. The wall thickness, on the other hand, ranges from 0.1 to 0.5 mm. On longitudinal sections it may be seen that the wall thickness is connected with zones of larger or smaller spacing of tabulae. Thinner walls occur in zones where spacing of tabulae is larger. Spacing of the corallites are not constant and range from 0.5 up to 3.2 mm in colonies from claystones and from 0.75 up to 2 mm in the colonies from detrital limestones.

*Syringopora novella* Klaamann, 1961

1961. *Syringopora novella* Klaamann; E. Klaamann; p. 95, Pl. 13, Figs 1—3.  
 1967. *Syringopora novella* Klaamann; A. Stasińska, p. 96, Pl. 30, Fig. 2a, b.  
 1971. *Syringopora novella* Klaamann; I. I. Tchudinova, p. 67, Text-fig. 1.

*Material.* — Fragments of 3 colonies (IG 1325.II.54—56).

*Distribution.* — Poland: Widowo, Wenlockian. Estonia: Wenlockian, Jaani Stage. Podolia: Wenlockian. Sweden: Island of Gotland, Wenlockian.

*Syringopora vestita* Tchudinova, 1971

(Pl. XXI, Fig. 2a, b)

1971. *Syringopora vestita* Tchudinova; I. I. Tschudinova, p. 74, Pl. 20, Fig. 1; Pl. 21, Fig. 1.

*Material.* — Fragment of a colony (IG 1325.II.57).

*Remarks.* — The specimen from Widowo does not differ from the representatives of the same species from Podolia.

*Distribution.* — Poland: Widowo, Wenlockian. Podolia: Malinovecki Stage.

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ANNA STASIŃSKA

### SYLURSKIE TABULATA Z POLSKI

#### *Streszczenie*

Opracowano Tabulata z osadów sylurskich z koralami na obszarze północno-wschodnim Polski, z wiercenia w Widowie (rejon Bielska Podlaskiego). Wstępne opracowanie stratygrafii w profilu Widowo, zostało dokonane na podstawie bardzo bogatej fauny trylobitów, brachiopodów i graptolitów (inf. ustna E. Tomczykowej).

Seria osadów wapiennych, sążąc z występujących tu Tabulata jest wieku wendlockiego. Występuje tu zespół gatunków charakterystycznych wyłącznie dla tego poziomu: *Halysites senior* Klaamann, *H. thomasi* sp. n., *Cystihalysites blakewayensis* Sutton, *Palaeofavosites frivulus* (Klaamann), *P. collatatus* Klaamann, *P. tenuis* Sokolov, *Favosites lichenarioides* Sokolov, *Coenites juniperinus* Eichwald, *Syringopora novella* Klaamann, oraz jeden przedstawiciel Heliolitoidea — *Heliolites decipiens* (McCoy). Starsza partia serii wapiennej odpowiada poziomowi jaani w Estonii, z charakterystycznym dla tego poziomu *Halysites senior*. Natomiast młodsza seria osadów odpowiada facji płytkowodnej z biohermami i występującym w nich *Coenites juniperinus*, zaliczonej w Estonii do poziomu jagarahu.

Wiekowi serii ilowcowej, występującej poniżej serii wapiennej nie udało się dokładnie określić.

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## СИЛУРИЙСКИЕ ТАБУЛЯТЫ ПОЛЬШИ

## Резюме

Исследовались табуляты, представленные в силурийских отложениях с кораллами, по разрезу скважины, пройденной в местности Видово (район Бельск-Подляски) в северо-восточной части Польши. Предварительное стратиграфическое расчленение пород в разрезе скважины Видово преведено на основании обильной фауны трилобитов, брахиопод и граптолитов (устное сообщение Э. Томчиковой).

Серия известняковых отложений на основании содержащихся в ней табулят относится к венлокскому ярусу. Здесь представлено сообщество видов, характерных исключительно для этого яруса (*Halysites senior* Klaamann, *H. thomasi* sp. n., *Cystihalysites blakewayensis* Sutton, *Palaeofavosites frivulus* (Klaamann), *P. collatatus* Klaamann, *P. tenuis* Sokolov, *Favosites lichenarioides* Sokolov, *Coenites juniperinus* Eichwald, *Syringopora novella* Klaamann, и один представитель *Heliolitoidea* — *Heliolites decipiens* (McCoу). Нижний интервал известняковой серии эквивалентен горизонту яани в Эстонии с характерными для этого горизонта *Halysites senior*. Верхний интервал осадков соответствует мелководной фации с биогермами, содержащими *Coenites juniperinus*, относенной в Эстонии к горизонту ягараху.

Возраст аргиллитовой серии, подстилающей серию известняков, не удалось определить достоверно.

## EXPLANATION OF PLATES

All specimens on Plates XVIII—XXI from Wenlockian, borehole Widowo

## Plate XVIII

- Fig. 1. *Halysites crassa* sp. n. Holotype, (IG 1325.II.1); cross-section,  $\times 10$ . Depth 529—530 m.  
 Fig. 2. The same species (IG 1325.II.2): cross-section,  $\times 5$ . Depth 546—547 m.  
 Fig. 3. *Halysites junioformis* sp. n. Holotype, (IG 1325.II.3): a cross- and b longitudinal sections.  $\times 5$ . Depth 527—528 m.



Fig. 4. *Halysites senior* Klaamann (IG 1325.II.10): longitudinal section,  $\times 5$ . Depth 559 m.

Fig. 5. The same species (IG 1325.II.11): cross-section,  $\times 5$ . Depth 535—537 m.

## Plate XIX

Fig. 1. *Halysites thomasi* sp. n. Holotype, (IG 1325.II.12): cross-section,  $\times 5$ . Depth 546—547 m.

Fig. 2. The same species (IG 1325.II.13): longitudinal section,  $\times 5$ . Depth 559 m.

Fig. 3. *Cystihalysites blakewayensis* Sutton (IG 1325.II.18): cross-section,  $\times 5$ . Depth 546—547 m.

Fig. 4. *Coenites juniperinus* Eichwald (IG 1325.II.49): cross-section,  $\times 10$ , b longitudinal section,  $\times 8$ . Depth 485—544.9 m.

## Plate XX

Fig. 1. *Palaeofavosites frivolus* (Klaamann IG 1325.II.25): a cross- and b longitudinal sections,  $\times 5$ . Depth 508—511 m.

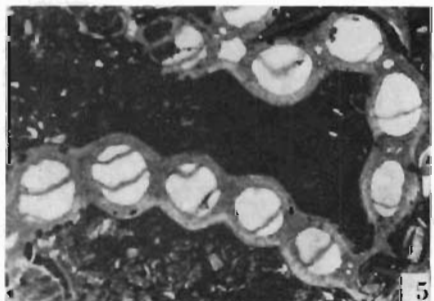
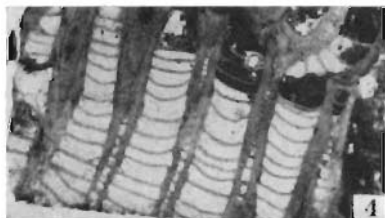
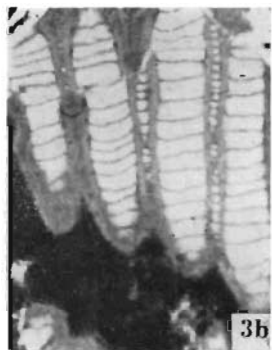
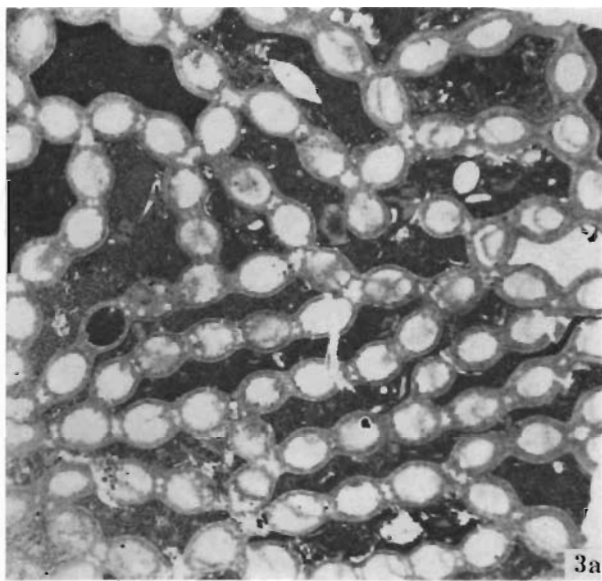
## Plate XXI

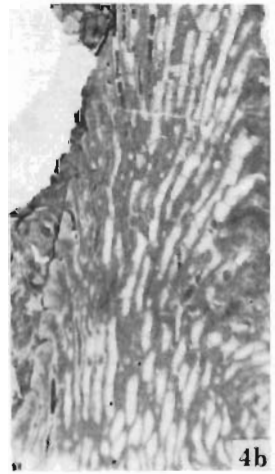
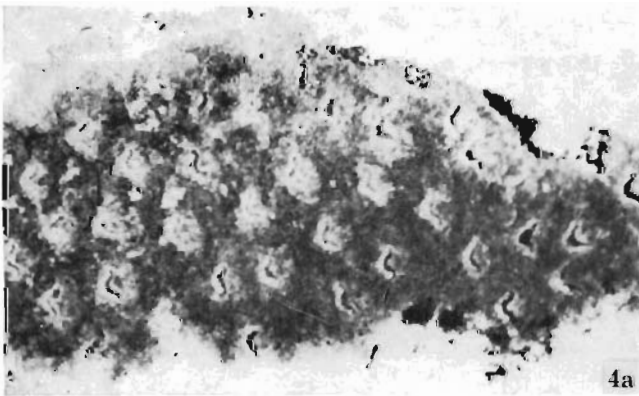
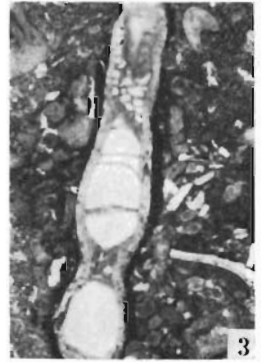
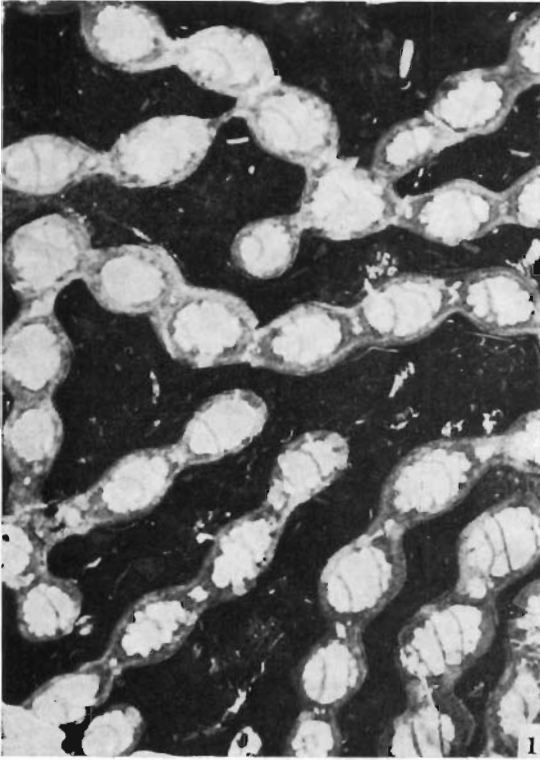
Fig. 1. *Palaeofavosites tersus* Klaamann (IG 1325.II.35): a cross- and b longitudinal sections,  $\times 5$ . Depth 508—511 m.

Fig. 2. *Syringopora vestita* Tchudinova (IG 1325.II.57): a cross- and b longitudinal sections,  $\times 5$ . Depth 491 m.

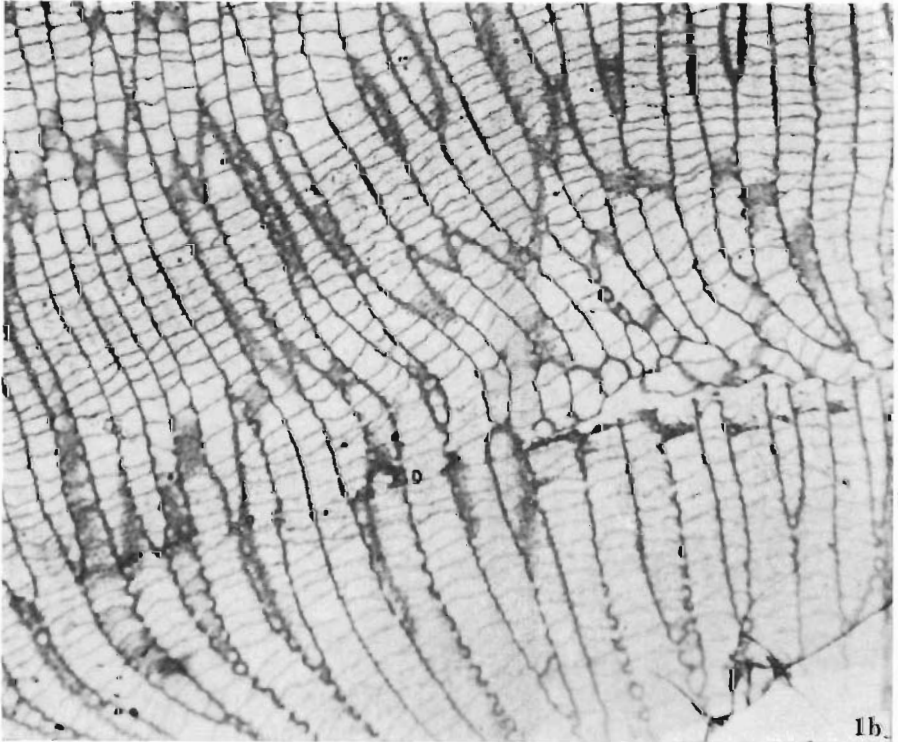
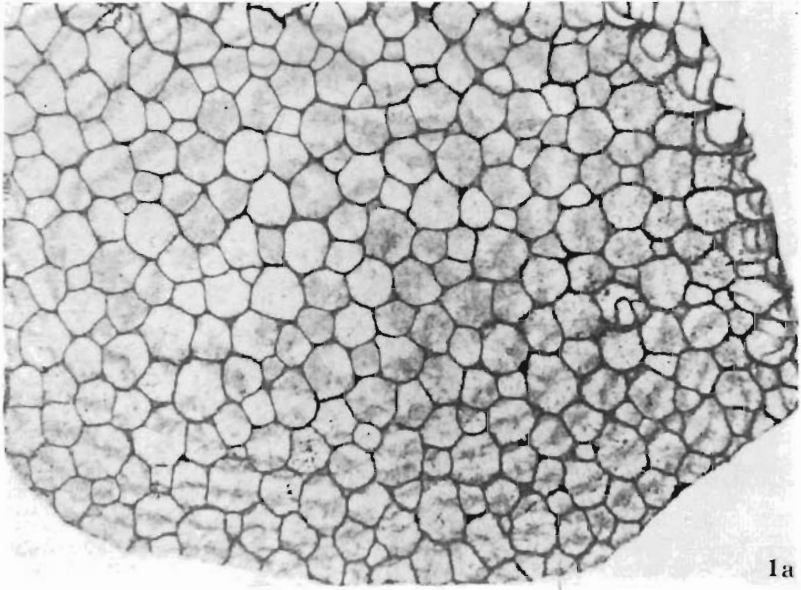
Fig. 3. *Cladopora perrara* Klaamann (IG 1325.II.46): cross- and longitudinal sections,  $\times 10$ . Depth 528—529 m.

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Phot: E. Mulawa



*Phot: E. Mulawa*

