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CARBONIFEROUS OSTRACODS FROM THE BORINGS IN NORTH-WESTERN POLAND

Abstract.— A description is given of the Carboniferous ostracods from the borings in North-western Poland. Thirty-four species, including fifteen species and two sub-species considered as new ones, are described and their stratigraphic importance discussed. In the sediments under study, three horizons have been distinguished differing in their ostracods. The first of them may correspond to the Tournaisian, the second to the Viséan, while the third's age has been approximately determined as the Namurian.

INTRODUCTION

The present paper contains the descriptions of the Carboniferous ostracods from the Rzeczenica 1 and Kłanino 1 boreholes in North-western Poland (Text-fig. 1) executed by the Petroleum Prospecting Enterprise in Piła.

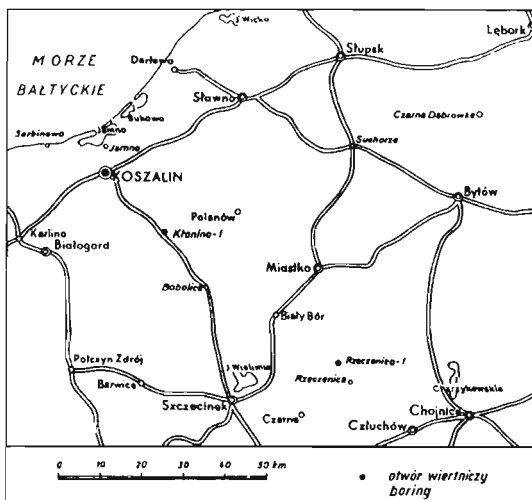


Fig. 1. — Distribution of borings.

The material was sampled in the most clayey parts of cores only. The depths at which samples were taken from two boreholes are given on stratigraphic profiles (Text-figs 2 and 3). The samples weighed 0.5 kg each. After a maceration in Glauber's salt, all ostracods mostly represented by carapaces and very few isolated right or left valves, were picked out of a residuum, whose amounts varied in particular samples between a half and twenty-five trays 10×6 cm in size. Thirty-four species belonging to sixteen families, twenty-two genera and two subgenera are described. Fifteen species and two subspecies have been considered as new ones. Nine species have been determined up to the level of genus. The taxonomy, given in the "Treatise of..." of R. C. Moore (1961) has been adopted. The ostracods described are housed in the collections of the Palaeozoological Institute of the Polish Academy of Sciences in Warsaw for which the abbreviation Z. Pal. is here used.

ACKNOWLEDGMENTS

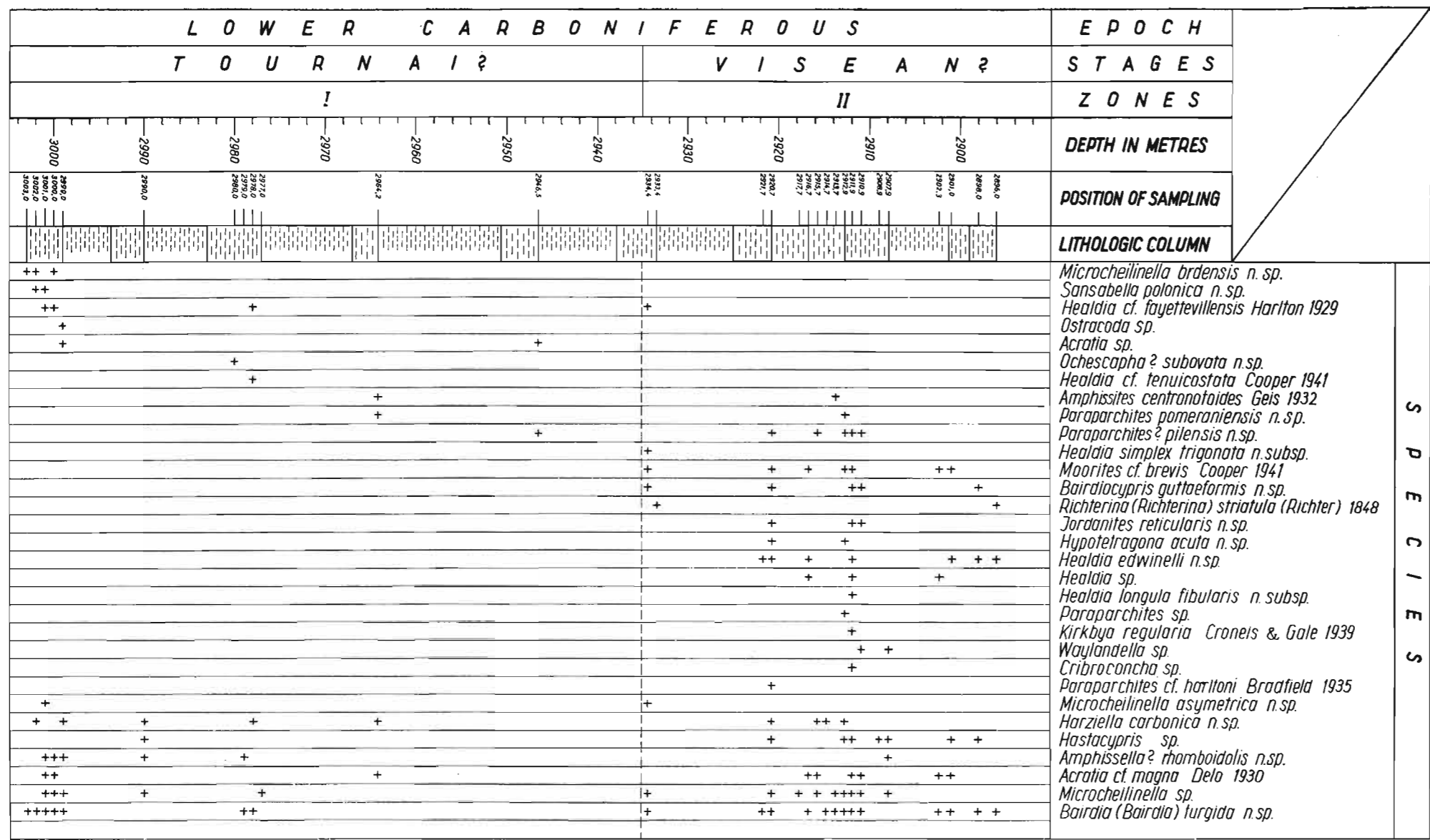
The writer's thanks are extended to the management of the Petroleum Prospecting Enterprise in Piła, to Mr. Ludgierd Cimaszewski, M. Sc., their Chief Geologist, for making available the materials necessary for this work and to the Union of Petroleum Industry in Warsaw for a permission to publish them. They are also grateful to Professor Roman Kozłowski from the Polish Academy of Sciences, Palaeozoological Institute in Warsaw for reading the manuscript and his valuable remarks. The writers feel indebted to Dr. Gerhard Becker from the Geological-palaeontological Institute of the Johann Wolfgang Goethe University in Frankfurt on the Main, Federal Republic of Germany, and to Dr M. J. M. Bless from the Rijks Geologische Dinst, Geologisch Bureau voor het Mijngewest in Heerlem, the Netherlands, for checking the determinations of the ostracods and for their remarks which turned out very useful in the ultimate editing of the present paper. Thanks are also due to Miss Małgorzata Wąsak from the Polish Academy of Sciences, Palaeozoological Institute in Warsaw, for taking photographs and to Mr. Jan Budnowski from the Petroleum Prospecting Enterprise in Piła for preparing the text-figures.

GEOLOGICAL AND FAUNAL CHARACTERISTICS OF THE PROFILES UNDER STUDY

Here described profiles of the Rzeczenica 1 and Kłanino 1 boreholes are situated on the north-eastern border of the Carboniferous basin, which, through the areas of the present Mogilno-Łódź synclinorium, the Kujawy-

Fig. 2. — Stratigraphic range of Ostracods from boring Rzecezenica 1 — 1, NW Poland.

CLAYSTONE + SAMPLING SITE



termine the age and that from a depth between 2368.0 and 2675.0 m suggest the Upper Carboniferous. On the basis of a geophysical analysis, Sikorski (1971, unpublished data) adopts a depth of 2547.5 m as a boundary between the Lower and Upper Carboniferous.

As found by a micropalaeontological analysis, the Kłanino 1 profile contains ostracods less differentiated specifically than those in Rzeczenica 1. A small number of individuals of particular species are represented only by fairly well preserved carapaces. Changes in the specific composition of ostracods allowed the writers to distinguish three horizons in these profiles. They have been separated at the following depths: horizon I at a depths of 2781.6 to 2730.0 m, horizon II — of 2730.0 to 2547.5 m and horizon III — of 2547.5 to 2379.0 m.

In horizon I, the Carboniferous deposits are developed in a clayey facies with arkoses, in horizon II in a facies of grey, dolomitic claystones with calcareous intercalations and in horizon III in a facies of variably grained dolomites, clayey-sandy with anhydrite intercalations. Out of sixteen species occurring in this profile, all the three species known from horizon I are in common with the remaining horizons. Out of eleven species known from horizon II, five do not exceed a depth of 2547.5 m. The remaining six pass to horizon III, where there occur two more species, one of them being characteristic of this horizon and the other known from horizon I of the Rzecznica 1 profile.

Comparing the horizons they distinguished, the writers conclude that the first two horizons in Klanino 1 correspond to two horizons in Rzeczenica 1. Horizon I in both profiles, marked by a small number of species, contains a considerable percentage of elements in common. The assemblage occurring in Rzeczenica 1 is more specific than that in Kłanino 1, since it contains eight species which do not pass to horizon II. Horizon II displays the largest specific differentiation, fourteen of its species being characteristic only of it. Horizon III, occurring only in Kłanino I, is marked by a poor fauna of ostracods, of which only one species, *Glyptopleura klanensis* n. sp., is characteristic of it. In addition to the species characteristic of particular horizons in the two profiles, there also occur species which pass through all horizons.

PALAEOGEOGRAPHICAL AND STRATIGRAPHICAL REMARKS

The ostracods under study come from lagoon deposits and for this reason comparing them with the ostracods from other geographical areas, in which the Carboniferous deposits are developed in a different facies, poses

Gielniów anticlinorium and the Warsaw synclinorium, contacts the Carboniferous of the Holy Cross Mountains and the Lublin synclinorium. The Rzeczenica 1 borehole is situated about 22 km north-west of Człuchów and Kłanino 1 23 km south-east of Koszalin (Text-fig. 1). The deposits of the Pomeranian Carboniferous in the Rzeczenica 1 borehole occur at a depth of 2901.5 to 3003.0 m and are developed in the form of gray, locally almost black, clayey and clayey-calcareous rocks with limestone intercalations, many fragments of the crinoid-spiriferoid fauna and pyrite conglomerates (Sikorski, 1970 unpublished data). In the Kłanino 1 borehole, the Carboniferous deposits occur at a depth of 2356.0 to 2864.0 m. A Namurian stage in the form of light-gray sandstone-quartzite rocks, with anhydrite laminae and laminated gray and yellow-brown claystones, frequently crumbling and containing black claystone intercalations, is distinguished by Sikorski (1971 unpublished data) at depths ranging from 2356.0 to 2547.5 m and a Viséan-Tournaisian stage, developed as dark-gray claystone rocks with muscovite and anhydrite intercalations containing carbonized flora, at depths ranging from 2547.5 to 2864.0 m. Limestone and gray dolomite intercalations, gray-pink arkoses containing pink feldspars and quartz and black claystones with a fauna of crinoids and brachiopods occur subordinately in the latter stage. In both boreholes, the boundary of the Carboniferous and that between the Tournaisian-Viséan and the Namurian have been determined on the basis of geophysical data (Sikorski, 1971 unpublished data).

Rzeczenica 1. — The macrofauna, described by Korejwo & Teller (1970, unpublished data) from a depth of 2907.0 to 3003.0 m, determines the age as Lower Carboniferous, which is confirmed by the flora found at a depth of 2899.0 to 2901.0 m and which includes *Cyclostigma asiatica* Rad. (Kuchciński, 1970, unpublished data).

It has been found by a micropalaeontological analysis that here occurring ostracods (Text-fig. 2) are considerably differentiated specifically although rather not very numerous individually. On the basis of changes in the specific composition two horizons may be distinguished in the profile. They are determined by the ostracods and separated from each other at a depth of 2935.0 m. These are horizon I at a depth of 3003.0 to 2935.0 m and horizon II at a depth of 2935.0 to 2896.0 m. In both horizons, the Carboniferous deposits are developed in a similar clayey-calcareous facies. Out of 31 species, occurring in the profile, only six are common in both horizons and out of eleven species characteristic of the lower ostracod horizon only three pass to lower parts of the upper horizon. The upper ostracod horizon is characterized by fourteen species most of which do not exceed a depth of 2900.0 m.

Kłanino 1. — The macrofauna, described by Korejwo & Teller (1971, unpublished data) from a depth between 2754.0 and 2756.0 m, does not de-

considerable problems. New species make up about a half of all the species here described. Except for one species, *Richteria* (*Richteria*) *striatula* (Richter, 1848), no species have been found in common with the areas of Western Europe and the U.S.S.R. On the other hand, six species have been found which are in common with North America. Four of them have tentatively been identified as: *Healdia* cf. *tenuicostata* Cooper, 1941; *Amphissites* *centronotdoites* Geis, 1932; *Acratia* cf. *magna* Delo, 1930; *Moorites* cf. *brevis* Cooper, 1941; *Kirkbya* *regularia* Croneis & Gale, 1939; *Parapar-chites* cf. *harltoni* Bradfield, 1935. A different character of ostracod species from North-western Poland from that of the species known from other European areas and their similarity to those from North America may be explained by peculiar ecological conditions which existed in these areas.

The study of the ostracods from the Rzeczenica 1 and Kłanino 1 bore-holes is considered by the writers as a preliminary, much the same as the stratigraphic conclusions resulting from it. The lack of more detailed data, concerning the stratigraphy of the Carboniferous in North-western Poland, as well as in the adjoining territory of the German Democratic Republic, where the Carboniferous is similarly developed, makes difficult the interpretation of the stratigraphic position of the fauna described which is so far endemic in character. Taking into account the differentiation of ostracod assemblages, occurring in a definite stratigraphic order, the thesis might be accepted that particular horizons correspond to particular stages of the Carboniferous. The Lower Carboniferous age of horizons I and II results from the character of flora and macrofauna. Likewise, the geophysical data (Sikorski, 1971 unpublished data) are interpreted so that the boundary between the Lower and Upper Carboniferous passes above the deposits containing both ostracod horizons. The differences in the specific composition between the ostracod assemblages of horizons I and II are more profound than merely ecological in character, since here observed assemblages occur in deposits of a similar facies. The writers consider them as stratigraphic differences and suggest to distinguish on their basis two stages of the Lower Carboniferous in the Rzeczenica 1 and Kłanino 1 profiles. Ostracod horizon I would mark out the Tournaisian and horizon II the Viséan stage. Horizon III occurs in a somplex of deposits with facies of a conspicuously isolated lagoon and differing, in the presence of dolomites and anhydrites, from the deposits belonging to horizons I and II. The relationship of horizon III to the fauna of older horizons is distinct. Its striking specific poverty was caused by unfavourable ecological conditions. On the basis of general micropalaeontological and geophysical data, the age of this fauna may be only very roughly determined as Namurian.

DESCRIPTIONS

Subclass **Ostracoda** Latreille, 1806

Order **Palaeocopida** Hennigsmoen, 1953

Suborder **Beyrichicopina** Scott, 1961

Superfamily **Beyrichiacea** Matthew, 1886

Family **Beyrichiidae** Matthew, 1886

Genus *Ochescapha* Becker, 1965

Ochescapha ?subovata n. sp.

(Pl. XXV, Figs 1 a—d)

Holotype: Pl. XXV, Fig. 1 (Z. Pal. No O.VIII/1)

Type horizon: Lower Carboniferous.

Type locality: Rzeczenica 1 borehole, depth 2980.0 m.

Derivation of the name: Lat. *subovata*: having a carapace suboval in outline.

Diagnosis. — Carapace suboval. Valves equal in size. Dorsal margin substraight, ventral curved. Anterior end rounded, posterior arcuate. Surface smooth with few tubercles. A single carina running along the free margin of each valve.

Material. — Three carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/1, Pl. XXV, Fig. 1.

Length 0.60, height 0.36.

Description. — Carapace suboval. Valves equal in size. Dorsal margin substraight, ventral curved. Anterior end rounded, posterior arcuate. Maximum height occurring at 1/3 of the distance from the anterior end. Surface smooth with few very fine, irregularly distributed tubercles. A single, fine carina is observed ventrally running along the free margin on both valves.

Remarks. — *Ochescapha ?subovata* n. sp. is similar in its lateral outline to *O. ?semicircularis* (Kummerov) 1953 (in Becker, 1965, Pl. 1, Fig. 2), from which it differs in the occurrence of few fine tubercles on the surface of valves.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position in meters: 2980.0.

Superfamily **Hollinacea** Swartz, 1936

Family **Hollinidae** Swartz, 1936

Genus *Jordanites* Bless, 1967

Jordanites reticularis n. sp.

(Pl. XXV, Figs 2 a—d)

Holotype: Pl. XXV, Fig. 2 (Z. Pal. No O.VIII/2)

Type horizon: Lower Carboniferous.

Type locality: Rzeczenica 1 borehole, depth 2912.0 m.

Derivation of the name: Lat. *reticulum* = reticle, having a carapace covered with a fine reticle.

Diagnosis. — Carapace suboval in lateral outline. Dorsal margin straight, ventral curved. Anterior and posterior end rounded. A sulcus occurs in the dorsomedial and a node in the anterodorsal part of valve. Surface of carapace reticulate.

Material. — Three carapaces and one left valve.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/2, Pl. XXV, Fig. 2.

Length 0.77, height 0.49.

Descriptions. — Carapace suboval in lateral outline. Dorsal margin straight, ventral curved. Anterior and posterior end rounded with few fine spines. Maximum convexity of carapace in the ventral and posterior part. A distinct sulcus occurs in the dorsomedial and a node in the anterodorsal part of each valve. Surface of carapace covered with a fine reticle.

Remarks. — *Jordanites reticularis* n. sp. differs from *J. honeei* Bless, 1970 in more rounded posterior end of carapace, deeper sulcus in dorso-medial part and reticulate surface.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling positions (in m): 2911; 2912; 1921. Borehole Kłanino 1, Carboniferous, sampling positions (in m): 2647 to 2392.3.

Superfamily **Kirkbyacea** Ulrich & Bassler, 1906

Family **Kirkbyidae** Ulrich & Bassler, 1906

Genus *Kirkbya* Jones, 1850

Kirkbya regularia Croneis & Gale, 1939

(Pl. XXV, Figs 3 a—d)

1939. *Kirkbya regularia* Croneis & Gale; C. Croneis & Gale, *New ostracodes...*, p. 268, Pl. 5, Fig. 10.

Material. — Ten carapaces.

Dimensions (in mm):

Carapace Z. Pl. No. O.VIII/3 (Pl. XXV, Fig. 3).

Length 0.85, height 0.45.

Description. — Carapace subsemicircular in lateral outline. Dorsal margin straight with cardinal angles at its ends. Ventral margin curved. Anterior and posterior end ovoidly rounded. Carapace slightly convex dorso-posteromedially and tapering anteriorly and posteriorly. The anterior, posterior and ventral marginal parts flattened. Two marginal rims reach cardinal angles. Surface of carapace ornamented with a fine reticle.

Remarks. — The specimens here described differ from the holotype in smaller dimensions and a straight dorsal margin and from *K.* sp. (Green, 1963, Pl. 2, Fig. 13) in the presence of two marginal rims.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2913. USA: Upper Mississippian, Southern Illinois.

Family **Amphissitidae** Knight, 1928Genus *Amphissites* Girty, 1910*Amphissites centronotoides* Geis, 1932

(Pl. XXV, Figs 4 a—b; Pl. XXVI, Figs 1 a—b)

1932. *Amphissites centronotoides* Geis; H. L. Geis, Some ostracodes..., p. 165, Pl. 24, Fig. 3.

Material. — Three carapaces.

Dimensions (in mm):

Carapace Z. Pal. No. O.VIII/4, Pl. XXV, Fig. 4; Pl. XXVI, Fig. 1.

Length 0.51, height 0.26.

Description. — Carapace uniformly elongate. Dorsal margin substraight, in the medial part somewhat concave. Ventral margin substraight. Anterior and posterior ends rounded, gently turning into the ventral margin. Carapace convex. A large node occurs in the dorsomedial part of each valve. Two marginal rims pass onto the dorsal surface. Surface of carapace, together with the dorsomedial node, is ornamented with a polygonal reticle.

Remarks. — Polish specimens differ from the holotype in smaller dimensions and from a specimen described by Sohn (1961, Pl. 7, Fig. 25) in a larger length and smaller height of their carapaces. The form here described is similar in lateral view to *Amphissites mimicus* Geis, 1932 described by Brayer (1952, Pl. 28, Fig. 2 a), but the lack of illustrations in dorsal view does not allow one to determine whether or not it is one and the same species.

Occurrence. — borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2914. The forms compared are known from the Middle and Upper Mississippian, U.S.A.

Family **Placideidae** Schneider, 1956Genus *Amphissella* Stover, 1956*Amphissella ? rhomboidalis* n. sp.

(Pl. XXVI, Figs. 2 a—d)

Holotype: Pl. XXVI, Fig. 2 (Z. Pal. No O.VIII/5).

Type horizon: Lower Carboniferous.

Type locality: Rzeczenica 1 borehole, depth 2990 m.

Derivation of the name: Lat. *rhomboidalis*, after outline of its carapace.

Diagnosis. — Carapace rhomboidal in lateral outline. Dorsal margin substraight, ventral slightly curved. Anterior end widely rounded, posterior rounded and gently turning into the ventral margin. In the anterior, posterior and ventral parts the carapace is convex. Surface of carapace reticulate. Hinge margin depressed, bordered by the dorsal margin. Longitudinal rims occur along the free margin.

Material. — Eight carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/5, Pl. XXVI, Fig. 2.

Length 0.50, height 0.28.

Description. — Carapace rhomboidal in lateral outline. Dorsal margin nearly straight, ventral slightly curved. Anterior end widely rounded, posterior rounded and gently turning into the ventral margin. Carapace slightly contracted in the dorsomedial and convex in the anterior, posterior and ventral parts. Surface of carapace reticulate. In the medial part of carapace, reticulation meshes are hexagonal, with one of them, occurring in the middle of both valves, being twice as large as the rest of them. In other parts of the surface of carapace, the reticulation is irregular. The hinge margin is slightly depressed in dorsal view and limited by the dorsal margin in both valves. In ventral aspect, longitudinal rims occur on both valves along the free margin.

Remarks. — *Amphissella ? rhomboidalis* n. sp. differs from *A. patagiata* Becker, 1964 in a larger convexity of carapace in the anterior, posterior and ventral parts and in a more rhomboidal lateral outline and angular dorsal and ventral outlines. Due to the presence of a distinct convexity of carapace in the anterior and posterior parts, the new species here described has been assigned conditionally by the present writers to the genus *Amphissella*. Species belonging to the genus *Amphissella* Stover, 1956 have hitherto been known from the Middle and Upper Devonian.

Occurrence. — borehole Rzeczenica 1, Lower Carboniferous, sampling positions (in m): 2979; 2990; 3001; 3002. borehole Kłanino 1, Carboniferous, sampling position (in m): 2588.30.

Superfamily **Youngiellacea** Kellett, 1933

Family **Youngiellidae** Kellett, 1933

Genus *Moorites* Coryell & Billings, 1932

Moorites cf. *brevis* Cooper, 1941

(Pl. XXVI, Figs. 3 a—d)

1941. *Moorites brevis* Cooper; C. L. Cooper, Chester ostracodes..., p. 64, Pl. 14, Fig. 43.

Material. — Thirteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/6, Pl. XXVI, Fig. 3.

Length 0.43, height 0.26.

Description. — Carapace subrectangular, very flat, with the right valve larger than the left. Dorsal margin straight. Cardinal angles distinct. Ventral margin straight, nearly parallel to dorsal. Anterior end slightly extended, in the posterodorsal part truncate, posterior truncate and rounded. A slightly marked ridge runs along the free margin.

Remarks. — The specimens here described differ from the holotype in a more extended anterior end, from *Moorites* sp., described by Ameron et al. (1970, Pl. 4, Figs 99—100), in a more rounded posterior end, from *M.* sp., described by Bless et al. (1969, Pl. 6, Fig. 13) in a less extended anterior end and in its ventral margin nearly parallel to the dorsal. Finally, it considerably differs from *M. calvatus* Green, 1963 in height.

Occurrence. — borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2901 to 2935. borehole Klanino 1, Lower Carboniferous, sampling positions (in m): 2585 and 2672. U.S.A.: Upper Mississippian, SW Illinois.

Suborder **Kloedenellocpina** Scott, 1961
 Superfamily **Kloedenellacea** Ulrich & Bassler, 1908
 Family **Geisinidae** Sohn, 1961
 Genus *Hypotetragona* Morey, 1935
Hypotetragona acuta n. sp.
 (Pl. XXVI, Figs. 4 a—d)

Holotype: Pl. XXVI, Fig. 4, Z. Pal. No O.VIII/7.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth 2914 m.

Derivation of the name: Lat. *acuta* = truncate, after a truncate anterodorsal margin of its carapace.

Diagnosis. — Carapace subrectangular in lateral outline. Dorsal margin straight, ventral convex. Anterior end extended, rounded and, in the anterodorsal part, truncate. Posterior end rounded. A sulcus occurs at one-third of the distance from the anterior end.

Material. — Four carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/7, Pl. XXVI, Fig. 4.

Length 0.60, height 0.34.

Description. — Carapace subrectangular in lateral outline. Dorsal margin straight, ventral margin convex. Anterior end extended, rounded, in the anterodorsal part truncate and forming an angle of 120° with the dorsal margin. Carapace irregularly convex. A sulcus, beginning near the dorsal margin and terminating on the line of the largest length of carapace, occurs at one-third of the distance from the anterior end on both valves. The largest height of carapace runs through the sulcus. The surface of carapace is covered with a hardly visible, fine reticulations. Carapace is elliptical in dorsal and ventral aspect.

Remarks. — *Hypotetragona acuta* n. sp. differs from *H. fimbriata* Peterson, 1964 in a more arcuate ventral and more truncate anterodorsal margin, as well as in a conspicuous sulcus. It differs from *H. ?* sp.1 Plum-

hoff, 1970 in a more arcuate ventral margin and more strongly extended anterior end of carapace.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling positions (in m): 2914 and 2922.

Family **Glyptopleuridae** Girty, 1910

Genus *Glyptopleura* Girty, 1910

Glyptopleura klanensis n. sp.

(Pl. XXVI, Figs 5 a—c; Pl. XXVII, Fig. 1)

Holotype: Pl. XXVI, Fig. 5, Pl. XXVII, Fig. 1, Z. Pal. No O.VIII/8.

Type horizon: Carboniferous.

Type locality: Borehole Kłanino 1, depth: 2397 m.

Derivation of the name: Lat. *klanensis*, after the locality Kłanino from which this species is first described.

Diagnosis. — Carapace suboval. Left and right valve equal in size. Dorsal margin straight, ventral slightly convex. Both anterior and posterior ends rounded. A slight contraction is observed in the dorsomedial part. Single, longitudinal costae occur over the entire surface of carapace.

Material. — Fifteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/8, Pl. XXVI, Fig. 5; Pl. XXVII, Fig. 1.

Length 0.89, height 0.56.

Description. — Carapace suboval in lateral outline. Left and right valve equal in size. Dorsal margin straight with angles at its ends. Ventral margin slightly convex. Both ends rounded. Carapace uniformly convex, slightly contracted in the dorsal part. The surface of carapace is covered with single, longitudinal costae.

Remarks. — *Glyptopleura klanensis* n. sp. differs from *G. nerthusae* Coryell & Johnson, 1939 in a convex ventral margin and uniform convexity of carapace and from *G. aff. costata* (M'Coy), 1844, described by Buschmina (1968, Pl. 9, Fig. 2), in a smaller number of longitudinal costae, which, in addition, are bigger.

Occurrence. — Borehole Kłanino 1, Carboniferous, sampling position (in m): 2397.

Family **Beyrichiopsidae** Henningsmoen, 1953

Genus *Beyrichiopsis* Jones & Kirkby, 1836

Beyrichiopsis binodosus n. sp.

(Pl. XXVII, Figs. 3 a—d)

Holotype: Pl. XXVII, Fig. 3, Z. Pal. No O.VIII/9.

Type horizon: Carboniferous.

Type locality: Borehole Kłanino 1, depth: 2395 m.

Derivation of the name: Lat. *binodosus* = with two nodes.

Diagnosis. — Carapace flat, suboval in lateral outline. The right valve larger than the left. Dorsal margin straight, ventral convex. Anterior end widely rounded, posterior slightly extended, narrowly rounded. On both valves, a single, large node occurs in the postero- and anterodorsal part and a longitudinal costa in the ventral part. The surface of valves is ornamented by fine, irregular pits.

Material. — Ten carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/9, Pl. XXVII, Fig. 3.

Length 0.71, height 0.42.

Description. — Carapace flat, suboval in lateral outline. The right valve larger than the left. Dorsal margin straight, terminating with angles, ventral convex. Anterior end widely rounded, posterior slightly extended and narrowly rounded. The largest height occurs in the anteromedial part. A large, round node occurs in the anterodorsal part of each valve. Another, large and oval node occurs on each valve in the posterodorsal part nearer the dorsal margin. A longitudinal costa, decreasing anteriorly, occurs on each valve in the ventral, most convex, part. The surface of carapace is ornamented by fine, irregular pits. A single, longitudinal rim is visible in ventral view on the marginal surface of each valve.

Remarks. — *Beyrichiopsis binodosus* n. sp. differs from so far described species on this genus in a more convex ventral margin, conspicuous rim in the ventral part, longitudinal shape of the posterodorsal node and a slight depression of both valves in the dorsomedial part.

Occurrence. — Borehole Kłanino 1, Carboniferous, sampling position (in m): 2395; 2398; 2624.

Family **Sansabellidae** Sohn, 1961

Genus *Sansabella* Raundy, 1926

Sansabella polonica n. sp.

(Pl. XXVII, Fig. 4 a—d)

Holotype: Pl. XXXVII, Fig. 4, Z. Pal. No O.VIII/10.

Type horizon: Lower Carboniferous.

Type locality: borehole Rzeczenica 1, depth: 3002 m.

Derivation of the name: Lat. *polonica* = first described from Poland.

Diagnosis. — Carapace trapezoidal in outline. The right valve slightly larger than the left. Dorsal margin straight, ventral slightly convex. Both ends uniformly rounded. On both valves, a gentle contraction occurs in the dorsomedial and a node in the anterodorsal part. Surface finely reticulate. The largest height of carapace in the anteromedial part.

Material. — Eight carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/10, Pl. XXVII, Fig. 4.

Length 0.77, height 0.44.

Description. — Carapace trapezoidal in outline. The right, slightly larger, valve overlaps the left at both ends. Dorsal margin straight, ventral slightly convex. Both ends uniformly rounded, turn into the dorsal margin at an obtuse angle. Valves unequally convex. The largest convex of carapace is observed in the posteromedial, ventral and anteroventral parts. A gentle contraction is marked on the medial surface of both valves beginning with the medial part of the dorsal margin. A node occurs in the anterodorsal part of both valves. The surface of valves finely reticulate. The largest height of carapace in the anteromedial part.

Remarks. — The carapaces of *Sansabella polonica* n. sp. are variable in size, more or less flattened and with a more or less strongly marked contraction in the dorsomedial part. The new species differs from *S. romeini* Bless, 1967 in single nodes occurring in the anterodorsal part.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 3001 and 3002.

Superfamily **Paraparchitacea** Scott, 1959

Family **Paraparchitidae** Scott, 1959

Genus *Paraparchites* Ulrich & Bassler, 1906

Paraparchites cf. *harltoni* Bradfield, 1935

(Pl. XXVI, Figs 6 a—b; Pl. XXVII, Figs 2 a—b)

1935. *Paraparchites harltoni* Bradfield; H. H. Bradfield, *Pennsylvanian Ostracoda...*, p. 33, Pl. 1, Fig. 9.

Material. — Three carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/11, Pl. XXVI, Fig. 6; Pl. XXVII, Fig. 2.

Length 0.38, height 0.29.

Description. — Carapace suboval in lateral outline. The left, larger valve overlaps the right along the ventral margin. Dorsal margin straight, terminating in angles, ventral strongly convex. Anterior end widely rounded, posterior truncate in the posterodorsal part, turning into the dorsal margin and forming an angle of 120°. The largest height occurs at one-third of the distance from the anterior end. Carapace convex in the medial and posteromedial part. A short spine with a wide base occurs in the posterodorsal part of the right valve. At the ends of the dorsal margin carapace is flattened below the angles. The surface of carapace is smooth. In the dorsal and ventral view, the carapace narrows anteriorly.

Remarks. — Polish specimens differ from the holotype in the size of carapace and occurrence of a spine in the posterodorsal part of the right valve. This form differs from *P. claytonensis* Knight, 1928 in a more convex ventral margin.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2922. U.S.A.: Middle Pennsylvanian, Middle Desmoinesian, Oklahoma.

Paraparchites ? pilensis n. sp.

(Pl. XXVII, Figs 5 a—b; Pl. XXVIII, Figs 1 a—b)

Holotype: Pl. XXVII, Fig. 5; Pl. XXVIII, Fig. 1, Z. Pal. No O.VIII/12.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth: 2911.9 m.

Derivation of the name: Lat. *pilensis* — after the locality Piła.

Diagnosis. — Carapace asymmetrically elliptical. The left valve larger than the right. Dorsal margin substraight, ventral convex. Posterior end truncate in the posterodorsal part, anterior widely rounded. A single, short, big spine occurs in the posterodorsal part of each valve. Surface of carapace finely reticulate.

Material. — Fourteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/12, Pl. XXVII, Fig. 5, Pl. XXVIII, Fig. 1. Length 0.80, height 0.51.

Description. — Carapace asymmetrically elliptical. The left, larger valve overlaps the right along the ventral margin. Dorsal margin substraight, terminating anteriorly in a distinct angle, ventral convex. Anterior end widely rounded, posterior truncate in the posterodorsal part and turning into the dorsal margin, forms an angle of 120°. The largest height occurs at one-third of the distance from the anterior end. Carapace convex in the medial and posteromedial part and narrowing anteriorly. A single, short and robust spine with a wide base occurs in the posterodorsal part of each valve. At the posterior end, carapace is flattened below the angle. The surface of carapace is covered with a very fine reticle.

Remarks. — *Paraparchites ? pilensis* n. sp. differs from here described *P. cf. harltoni* Bradfield, 1935 in larger dimensions of carapace, outline of the anteroventral margin and presence of single spines in the posterodorsal part of both valves.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2912.0 to 2946.0. Borehole Kłanino 1, Carboniferous, sampling position (in m): 2622.10 to 2390.30.

Paraparchites pomeraniensis n. sp.

(Pl. XXVIII, Figs 2 a—d)

Holotype: Pl. XXVIII, Fig. 2, Z. Pal. No O.VIII/13.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth 2930 m.

Derivation of the name: after Pomerania, a region of Poland from which the species has first been described.

Diagnosis. — Carapace suboval in lateral outline. Dorsal margin nearly straight, ventral convex. Anterior end widely rounded, posterior tapering and rounded, in the posterodorsal section slightly truncate. A single spine occurs in the posterodorsal part of each valve. Surface of carapace smooth.

Material. — Four carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/13, Pl. XXVIII, Fig. 2.

Length 0.72, height 0.49.

Description. — Carapace suboval in lateral outline. The larger, left valve overlaps the right along the ventral margin. Dorsal margin nearly straight, with distinct angles at its ends. Ventral margin strongly convex. Anterior end widely rounded, posterior tapering, rounded and, in the posterodorsal section, slightly truncate. Maximum height at the anteromedial part of carapace. Carapace convex in the posteromedial part and narrowing anteriorly. A single, large spine occurs in the posterodorsal part of each valve. Surface of carapace smooth.

Remarks. — *Paraparchites pomeraniensis* n. sp. differs from *P. nicklesi* (Ulrich), 1891 (in Green, 1963, Pl. 8, Figs 10—11) in a substraight dorsal margin, robust spine in the posterodorsal part of valve and cardinal angles projecting above the dorsal margin.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2914 and 2963.

Paraparchites sp.

(Pl. XXVIII, Figs. 3 a—d)

Material. — Two poorly preserved carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/14, Pl. XXVIII, Fig. 3.

Length 0,51, height 0,49.

Description. — Carapace suboval in lateral outline. Dorsal margin straight, terminating in angles, ventral strongly convex. Anterior end widely rounded, posterior truncate in the posterodorsal section. Maximum height at one-third of the distance from the anterior end. The left valve convex, with a short spine having a wide base and occurring in the posterodorsal part. The right valve damaged. Surface of carapace smooth.

Remarks. — *Paraparchites* sp. is similar in lateral outline to *P. harltoni* Bradfield, 1935 from which it, however, differs in having a spine on the left valve. From *P. sp. cf. P. pinguis* Green (1963, Pl. 8, Figs. 8 and 9) it differs in the occurrence of a larger spine which is situated more dorsally and in the outline of posterior end which is more truncate in the posterodorsal sector.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2913.

Order **Podocopida** Müller, 1894
Suborder **Podocopina** Sars, 1886
Superfamily **Bairdiacea** Sars, 1888
Family **Bairdiidae** Sars, 1888
Genus *Bairdia* McCoy, 1844
Bairdia (Bairdia) turgida n. sp.

(Pl. XXVIII, Figs 4 a—b; Pl. XXIX, Figs 1 a—b)

Holotype: Pl. XXVIII, Fig. 4; Pl. XXIX, Fig. 1, Z. Pal. No O.VIII/15.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth 2913 m.

Derivation of the name: Lat. *turgida* = swollen, after its robust, swollen carapace.

Diagnosis. — Carapace very large, elongate. The left valve larger. Dorsal margin strongly convex, ventral less so. Anterior end extended, rounded, posterior extended, pointed and slightly upturned. Maximum height at the medial part. Carapace swollen, its surface finely granulate.

Material. — Thirty-five carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/15, Pl. XXVIII, Fig. 4; Pl. XXIX, Fig. 1.
Length 0.93, height 0.58.

Description. — Carapace very large, elongate. The left, larger valve overlaps the right along the dorsal and ventral margin. Dorsal margin strongly convex, in the anterodorsal part gently turning into an extended anterior end and in the posterodorsal suddenly deflecting posteriorly. Ventral margin gently convex. Anterior end extended, rounded, posterior extended, pointed and slightly upturned. Maximum height at the medial part of carapace. Carapace strongly convex, its surface very finely granulate. A flattening of the carapace in the posterior and anterior marginal part is observed in dorsal and ventral view.

Remarks. — Due to the presence of only one species of the genus *Bairdia* in the material under study, the writers refrain themselves from expressing opinion on separating new genera from the genus *Bairdia*, including species strongly differing morphologically (Sohn, 1960, pp. 11—56). For the time being, they accept Becker's (1955, pp. 414—415) suggestions concerning the erection of new subgenera. *Bairdia (Bairdia) turgina* n. sp. differs from *Bairdia (Bairdia) pompilioides* Harlton, 1928 in a more rounded anterior end, overlapping of valves in the ventral part and a stronger swelling of carapace. From *B. (B) subpompilioides* Becker, 1965 it differs in a more convex dorsal and less so ventral margin and from *B. bicarinata* Zanina (1971, Pl. 2, Fig. 1) in a uniformly extended anterior end. From *B. artshtensis* Bushnina (1968, Pl. 22, Fig. 1), it differs in more extended both ends of carapace and from *B. hypseta* Rome (1971, Text-figs 25 and

26) in a more extended posterior end of carapace and more convex dorsal margin of the right valve.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2896 to 3003. Borehole Kłanino 1, Carboniferous, sampling position (in m): 2393 to 2675.

Genus *Acratia* Delo, 1930
Acratia cf. *magna* Delo, 1930
 (Pl. XXIX, Figs. 2 a—d)

1930. *Acratia magna* Delo; D. M. Delo, Some Upper Carboniferous..., p. 175, Pl. 13, Fig. 13.

Material. — Eighteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/16, Pl. XXIX, Fig. 2.

Length 0.92, height 0.35.

Description. — Carapace strongly elongate. The left valve somewhat larger. Dorsal margin slightly convex, ventral straight. Anterior end extended, in the anterodorsal part slightly truncate, posterior tapering, pointed. In the medial part, carapace gently convex, in the posteroventral angularly convex. Maximum height at one-third of the distance from the anterior end. Surface of carapace smooth.

Remarks. — Here described *Acratia* cf. *magna* Delo differs from the holotype in a more rounded anterior part and smaller length and height of carapace.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2901 to 3000. Borehole Kłanino 1, Carboniferous, sampling position (in m): 2396 to 2781,60. *A. magna* Delo occurs in the Carboniferous of the U.S.A.

Acratia sp.
 (Pl. XXIX, Figs. 3 a—d)

Material. — Eight carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/17, Pl. XXIX, Fig. 3.

Length 0.38, height 0.24.

Description. — Carapace oval. The left, slightly larger valve overlaps the right in the anterodorsal part. Dorsal margin strongly and ventral gently convex. Both ends slightly extended. Carapace strongly convex. Maximum height is recorded in the medial part. Surface smooth.

Remarks. — *Acratia* sp. differs from *A. wolhynica*, Kummerov, 1953 in less extended both ends, as well as in smaller length and height of carapace.

pace. The description of *A. wolhynica* Kummerov (1953, p. 57) corresponds to a drawing in Pl. 7, Figs. 10 a, b (not Pl. 6, Figs. 10 a, b), which — so understood — was also published in Ellis & Messina's catalogue of the ostracods. From this would result that in Kummerov's work there was an error in the Plate numeration. In Kummerov's review of a stratigraphic occurrence of the species described (Kummerov, 1953, p. 64) and in an alphabetical list of the localities in which *A. wolhynica* Kummerov, 1953 was found, among other species, Kummerov unexpectedly mentions *A. dubia* Kummerov, 1953 without either a description or illustration of this new species. *Acratia* sp. differs from *A. dobrotvorskajae* Martinova, 1960 in the outline of the anterior and posterior end of carapace and in the lack of their bifurcation.

Occurrence. — Rzeczenica 1 borehole, Lower Carboniferous, sampling position (in m): 2946 and 2998.

Family uncertain

Genus *Hastacypris* Croneis & Gutke, 1939

Hastacypris sp.

(Pl. XXIX, Fig. 5)

Material. — Thirteen right, poorly preserved valves.

Dimensions (in mm):

Right valve Z. Pal. No O.VIII/18, Pl. XXIX, Fig. 5.

Length 0.45, height 0.17.

Description. — Valve strongly elongate. Dorsal margin slightly convex, arcuate and deflected posteriorly. Ventral margin nearly straight. Anterior end truncate and rounded, posterior extended, in the posteroventral part pointed. Valve slightly convex, its surface smooth.

Remarks. — *Hastacypris* sp. differs from *H. bradyi* Croneis & Gutke, 1939 in a less extended posterior part, less convex dorsal margin and higher anterior part of valve.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2900 to 2990.

Suborder **Metacopina** Sylvester-Bradley, 1961

Superfamily **Healdiacea** Harlton, 1933

Family **Healdiidae** Harlton, 1933

Genus *Healdia* Roundy, 1926

Healdia cf. *tenuicostata* Cooper, 1941

(Pl. XXX, Fig. 1 a—d)

1941. *Healdia tenuicostata* Cooper; C. L. Cooper, Chester ostracodes..., p. 32, Pl. 4, Figs. 13—14.

Material. — Four carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/19, Pl. XXX, Fig. 1.

Length 0.79, height 0.42.

Description. — Carapace strongly extended posteriorly. Left valve larger. Dorsal margin convex, ventral straight. Anterior end bluntly terminating, posterior extended, rounded. Carapace strongly convex. Maximum height at one-third of the distance from the anterior margin. A single node occurs in the posteroventral part of both valves. A barely visible posterior ridge runs posterodorsally from the node. Very fine, meandering grooves (= articulation channelets) occur on the surface of carapace. In dorsal and ventral view, carapace is ovate in outline with both ends slightly projecting.

Remarks. — Here described *Healdia* cf. *tenuicostata* Cooper, 1941 differs from the holotype in a more elongate posterior part of carapace, larger dimensions and the occurrence of maximum height at one-third of the distance from the anterior margin.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2978. U.S.A.: Upper Mississippian.

Healdia cf. *fayettevillensis* Harlton, 1929

(Pl. XXX, Fig. 2 a—d)

1929. *Healdia fayettevillensis* Harlton; B. H. Harlton, Some Upper Mississippian..., p. 263, Pl. 2, Fig. 2.

Material. — Thirteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/20, Pl. XXX, Fig. 2.

Length 0.72, height 0.49.

Description. — Carapace suboval in lateral outline. The left, larger valve overlaps the right along the dorsal, anterodorsal and ventral margin. Dorsal margin convex in the medial part, ventral straight. Anterior and posterior end uniformly rounded. Maximum height at one-third of the distance from the anterior margin. Maximum thickness in the medial part of carapace. A single spine occurs in the posteroventral part of both valves. The surface of carapace very finely punctate. Carapace elliptical in ventral and dorsal outline.

Remarks. — Polish specimens differ from the holotype in the lack of single spines in the posterodorsal part of valve and in a longer carapace.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2946; 2978; 3000; 3001. U.S.A.: Upper Mississippian.

Healdia edwinelli n. sp.

(Pl. XXIX, Figs 4 a—c; Pl. XXX, Fig. 3)

Holotype: Pl. XXIX, Fig. 4; Pl. XXX, Fig. 3, Z. Pal. No O.VIII/21.*Type horizon*: Lower Carboniferous.*Type locality*: Borehole Rzeczenica 1, depth 2896.*Derivation of the name*: *edwinelli*—after the name of the second writer's son.

Diagnosis. — Carapace elongate. Dorsal margin strongly convex in the medial part, ventral slightly concave. Anterior end rounded; posterior bluntly rounded. In the posterior part of carapace spines are connected with the posterior ridge having the form of a clasp. The surface of carapace smooth.

Material. — Eighteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/21, Pl. XXIX, Fig. 4; Pl. XXX, Fig. 3

Length 0.52, height 0.30.

Description. — Carapace elongate. The left valve larger than the right. Dorsal margin strongly convex medially, ventral slightly concave in the medial part. Anterior end rounded, posterior more bluntly rounded. Single spines occur in the posterodorsal and posteroventral part of both valves. The posterior ridge slightly shifted medially and connecting both spines in the form of a clasp. The surface of carapace is slightly concave between the posterior margin and posterior ridge. In dorsal and ventral view, the carapace tapers anteriorly beginning with a point at two-thirds of its length.

Remarks. — *Healdia edwinelli* n. sp. differs from *H. masoni* Coryell & Booth, 1933 in a slight anterior shift of the maximum height of carapace, smaller width of the posterior part and a clasp-like shape of the posterior ridge. From *H. caneyensis* Harlton, 1927, described by Harlton (1933, Pl. 7, fig. 10), it differs in a more extended anterior part of carapace.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2896 to 2923.

Healdia longula fibularis n. subsp.

(Pl. XXX, Figs 4 a—d)

Holotype: Pl. XXX, Fig. 4, Z. Pal. No O.VIII/22.*Type horizon*: Lower Carboniferous.*Type locality*: Borehole Rzeczenica 1, depth 2912 m.

Derivation of the name: Lat. *fibula* = a clasp, after its posterior ridge, bent in the form a clasp.

Diagnosis. — Carapace elongate. Dorsal margin convex, ventral straight. Single spines in the posterodorsal and posteroventral part are connected with each other by a clasp-like ridge somewhat lower than these spines.

Material. — Three carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/22, Pl. XXX, Fig. 4.

Length 0.60, height 0.31.

Description. — Carapace elongate. The left valve slightly larger than the right. Dorsal margin convex, ventral straight. Posterior end flatly rounded, anterior extended. Carapace slightly convex posteromedially. Spines, occurring in the posterodorsal and posteroventral part, are connected with each other by a lower, clasp-like posterior ridge. A slight depression occurs on the carapace between the posterior ridge and posterior margin. Surface of carapace smooth.

Remarks. — *Healdia longula fibularis* n. subsp. differs from *H. longula* Cooper, 1946 in a more extended anterior part of carapace, a maximum height which occurs in the anteromedial part and in a clasp-like shape of the posterior ridge.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2912.

Healdia simplex trigonata n. subsp.

(Pl. XXXI, Figs 1 a—d)

Holotype: Pl. XXXI, Fig. 1, Z. Pal. No O.VIII/23.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth 2935 m.

Derivation of the name: Lat. *trigonata* = triangular, after a subtriangular lateral outline of carapace.

Diagnosis. — Carapace subtriangular in lateral outline. Dorsal margin strongly convex in the medial part, ventral straight. Carapace convex medially and contracting anteriorly. Posterior ridge curved backwards.

Material. — Three carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/23, Pl. XXXI, Fig. 1.

Length 0.63, height 0.44.

Description. — Carapace subtriangular in lateral outline. Left valve slightly larger than right. Dorsal margin strongly convex medially, ventral straight. Both ends uniformly rounded. Carapace strongly convex medially and tapering anteriorly. A sharp-edged posterior ridge curved backwards occurs in the posterior part of both valves. A distinct depression of carapace is visible between the posterior ridge and posterior margin. Surface of carapace smooth.

Remarks. — *Healdia simplex trigonata* n. subsp. differs from *H. simplex* Roundy, 1926 in a slightly smaller length and larger height of carapace. In addition, the posterior ridge in *H. simplex trigonata* n. subsp. is sharp-edged and the anterior end of carapace uniformly rounded. From *H. kazhimica*

Gusseva (Gusseva, 1971, Pl. 54, Fig. 11) it differs in a backward curve of the posterior ridge.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2935.

Healdia sp.

(Pl. XXXI, Fig. 2)

Material. — Eight poorly preserved and partly damaged valves.

Dimensions (in mm):

Left valve, Z. Pal. No O.VIII/24, Pl. XXXI, Fig. 2.

Length 0.47, height 0.28.

Description. — Valve elongate. Dorsal margin slightly convex, ventral straight. Anterior end rounded. Valve flat. Maximum height at the medial part of valve. Single spines, connected with each other by a slightly lower posterior ridge, occur in the posterodorsal and posteroventral part. Surface of valve smooth.

Remarks. — In view of a poor state of preservation of valves and their partial damage, accurate comparisons were impossible.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2902; 2912; 2916. Borehole Kłanino 1, Lower Carboniferous, sampling position (in m): 2622.1 and 2673.

Genus *Cribroconcha* Cooper, 1941

Cribroconcha sp.

(Pl. XXXI, Fig. 3)

Material. — Two valves, each lacking the anterior part.

Dimensions (in mm):

Right valve Z. Pal. No O.VIII/25, Pl. XXXI, Fig. 3.

Length 0.25, height 0.28.

Description. — Valve flat. Posterior end rounded. Single spines, occurring in the posterodorsal and posteroventral part, are directed posteriorly and project outside the outline of valve. The posterior ridge, considerably lower than the spines, connects them and passes onto the dorsal and ventral sides, limiting the posterior part of valve on which there occur nine round pits arranged in transverse rows. Surface of valve very finely granulate.

Remarks. The posterior part of valve in *Cribroconcha* sp. differs from that in *C. costata* Cooper (Cooper, 1941, Pl. 3, Fig. 38) in longer spines projecting outside, the outline of valve and in a lower number of pits on its surface.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2912.

Genus *Waylandella* Coryell & Billings, 1932*Waylandella* sp.

(Pl. XXXI, Fig. 4)

Material. — Four left valves.

Dimensions (in mm):

Left valve Z. Pal. No O.VIII/26, Pl. XXXI, Fig. 4.

Length 0.50, height 0.31.

Description. — Valve semioval. Dorsal margin convex, ventral slightly concave in the medial part. Anterior end extended, rounded, posterior bluntly rounded. Maximum height at the posteromedial part. A single spine, projecting posteriorly outside the outline of valve, is situated in the posterodorsal part. The posteroventral spine probably of the same shape. A very delicate posterior ridge passes outside the spine along the dorsal margin. Surface of valve smooth.

Remarks. — The valve of *Waylandella* sp. differs from that of *W. symmetrica* Cooper, 1946 in a more bluntly rounded posterior end and considerably longer posterodorsal spine.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2907 and 2910. Borehole Kłanino 1, Lower Carboniferous, sampling position (in m): 2622.10.

Family **Bairdiocyprididae** Shaver, 1961Genus *Bairdiocypris* Kegel, 1932*Bairdiocypris guttaeformis* n. sp.

(Pl. XXXI, Figs 5 a—d)

Holotype: Pl. XXXI, Fig. 5, Z. Pal. No O.VIII/27.

Type horizon: Lower Carboniferous.

Type locality: Rzeczenica 1 borehole, depth 2897 m.

Derivation of the name: Lat. *gutta* = a drop, after its carapace, resembling in dorsal view a falling drop.

Diagnosis. — Carapace suboval. Left valve overlapping right all around. Dorsal margin convex, ventral nearly straight. Posterior end rounded, anterior slightly extended. Maximum height slightly shifted posteriorly of the middle of carapace. Surface smooth.

Material. — Thirteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/27, Pl. XXXI, Fig. 5.

Length 0.43, height 0.29.

Description. — Carapace suboval. The left valve overlaps the right all around. Dorsal margin of the left valve more convex than that of the right. Ventral margin nearly straight. Posterior end rounded, anterior extended. Carapace convex. Maximum height slightly shifted posteriorly of the

middle of carapace. Surface smooth. In dorsal and ventral view, carapace is similar in outline to a falling drop.

Remarks. — *Bairdiocypris guttaeformis* n. sp. is similar to *B. pygmaea* Becker, 1965 from which it differs in a more convex dorsal margin of the right valve and rounded posterior and extended anterior end of carapace.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2897 to 2935. Borehole Kłanino 1, Carboniferous, sampling position (in m): 2379 to 2674.

Family **Cavellinidae** Egorov, 1950

Genus and species indet.

(Pl. XXXI, Figs 6 a—d)

Material. — Two carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/28, Pl. XXXI, Figs 6 a—d.

Length 0.67, height 0.45.

Description. — Carapace ovate in lateral outline. The right, larger valve overlaps the left along the dorsal and ventral margin. Dorsal margin slightly convex medially, ventral straight in the left and substraight in the right valve. Anterior end uniformly rounded, posterior rounded and in the posteroventral part slightly truncate. Maximum height at one-third of the distance from the anterior end. Carapace uniformly convex. A single spine occurs in the anterodorsal part of each valve. Surface smooth.

Remarks. — Here described carapace, whose right, larger valve overlaps the left along the dorsal and ventral margin, has been assigned to the family Cavellinidae. The scarcity of material precludes the possibility of a more accurate determination of this ostracod.

Occurrence. — Borehole Kłanino 1, Lower Carboniferous, sampling position (in m): 2625.

Suborder and family uncertain

Genus *Microcheilinella* Geis, 1933

Microcheilinella asymmetrica n. sp.

(Pl. XXXI, Figs 7 a—d)

Holotype: Pl. XXXI, Fig. 7, Z. Pal. No O.VIII/30.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth 2935 m.

Derivation of the name: Lat. *asymmetrica* = asymmetric, after a longitudinal depression in the dorsomedial part of only one valve.

Diagnosis. — Carapace elliptical in lateral outline. The left valve larger than the right. Dorsal margin of the left valve convex, of the right straight. Ventral margin straight. Anterior end of carapace rounded, in the anterodorsal part slightly truncate. Posterior end of the right valve rounded, of

the left slightly truncate in the posteroventral part. Carapace strongly convex. A longitudinal depression occurs in the dorsomedial part of the left valve only. Surface smooth.

Material. — Ten carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/30, Pl. XXXI, Fig. 7.

Right valve	Left valve
-------------	------------

length 0.42	0.51
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height 0.21	0.26
-------------	------

width of carapace 0.28

Description. — Carapace elliptical in lateral outline. The left, larger valve overlaps the right all around. Dorsal margin of the left valve convex, of the right nearly straight, ventral straight in both valves. Anterior end of both valves rounded, in the anterodorsal part somewhat truncate. Posterior end of the right valve rounded, of the left slightly truncate in the posteroventral part. Carapace strongly convex. A deep longitudinal depression with a sharp dorsal margin occurs in the dorsomedial part of the left valve only. The opposite margin of the depression gently passes onto the medial surface of valve. Surface of carapace smooth. In dorsal view, the connection line of both valves is deflected to the left and in the ventral view — to the right. The right valve uniformly convex, the left slightly flattened in the anteroventral and posterodorsal part. Carapace wider than high.

Remarks. — *Microcheilinella asymmetrica* n. sp. differs from *M. tumida* Cooper, 1941 in a considerably more convex carapace and the presence of a deep, longitudinal depression in the dorsomedial part of the left valve. From *M. composita* Zanina (Zanina, 1971, Pl. 49, Fig. 6) and *M. larionovae elongata* Polenova (Polenova, 1960, Pl. 7, Fig. 4) it differs in the presence of a longitudinal depression in the dorsomedial part of the left valve.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2935 and 3001.

Microcheilinella brdensis n. sp

(Pl. XXXII, Figs 1 a—d)

Holotype: Pl. XXXII, Fig. 1, Z. Pal. No O.VIII/29.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth 3000 m.

Derivation of the name: Lat. *brdensis*, after the name of the Brda River.

Diagnosis. — Carapace elliptical in outline. The left valve larger than the right. Both margins convex. Anterior end rounded, posterior extended, rounded. Carapace strongly swollen. Surface smooth.

Material. — Eight carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/29, Pl. XXXII, Fig. 1.

Length 0.42, height 0.25.

Description. — Carapace elliptical in lateral outline. The left valve overlaps the right all around. Dorsal margin of the left valve convex, of the right nearly straight. Ventral margin slightly convex in both valves. Anterior end rounded, posterior extended, rounded, in the posteroventral part slightly truncate. Maximum height and convexity of carapace at one-third of the distance from the posterior end. Surface smooth.

Remarks. — *Microcheilinella brdensis* n. sp. differs from *M. tumida* Cooper, 1941 in a higher carapace and more extended posterior end. From *M. asymmetrica* n. sp. it differs in the lack of a deep, longitudinal depression in the dorsomedial part of the left valve.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 3000; 3002; 3003. borehole Kłanino 1, Carboniferous, sampling position (in m): 2396; 2464.5.

Microcheilinella sp.
(Pl. XXXII, Figs 2 a—d)

Material. — Twenty-four poorly preserved carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/31, Pl. XXXII, Fig. 2.

Length 0.47, height 0.28, width of carapace 0.29.

Description. — Carapace elongate. The left, larger valve overlaps the right along the dorsal and ventral margin. Dorsal margin subparallel to the ventral. Both ends uniformly rounded. Carapace strongly convex in the posteromedial part. Surface smooth.

Remarks. — The poor state of the preservation of material precludes its specific identification. In lateral and dorsal outline, the carapace of *Microcheilinella* sp. is similar to *M. quadrata* Cooper, 1946 and to *M. regularis* Polenova (Polenova, 1968, Pl. 25, Fig. 1).

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2908 to 3001.

Order **Myodocopida** Sars, 1866
Suborder **Myodocopina** Sars, 1866
Family **Entomozoidae** Přibyl, 1951
Subfamily **Richteriniinae** Sylvester Bradley, 1961
Genus *Richterina* Gürich, 1896
Richterina (Richterina) striatula (Richter), 1848
(Pl. XXXII, Figs 4 a—b)

1848. *Cytherina striatula* Richter; R. Richter, Beitrag zur Paläontologie..., p. 29, Pl. 2, Figs 5—13.

1929. *Richterina (Richterina) striatula* (Richter); H. Matern, Die Ostracoden des Oberdevons..., p. 64, Pl. 5, Fig. 56.

Material. — Five carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/32, Pl. XXXII, Fig. 4.

Length 1.01, height 0.63.

Description. — Carapace elliptical. Both margins convex. Both ends rounded. The entire surface of carapace is covered with longitudinal costae converging at one end and slightly more widely spaced at the opposite end.

Remarks. — Here described specimens are smaller and more flattened than others known in literature. A poor state of the preservation of carapace precludes its proper orientation.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2896; 2935. Eurasia: Upper Devonian and Lower Carboniferous.

Order, suborder and family uncertain

Genus *Harziella* Müller-Steffen, 1965

Harziella carbonica n. sp.

(Pl. XXXI, Fig. 8; Pl. XXXII, Figs 3 a—c) *

Holotype: Pl. XXXI, Fig. 8; Pl. XXXII, Fig. 3, Z. Pal. No O.VIII/33.

Type horizon: Lower Carboniferous.

Type locality: Borehole Rzeczenica 1, depth 2921 m.

Derivation of the name: Lat. *carbonica* = occurring in the Carboniferous.

Diagnosis. — Carapace uniformly elongate in outline. The right valve larger than the left. Dorsal margin straight, terminating with angles, ventral straight, parallel to dorsal. Anterior end slightly extended, in the anterodorsal part truncate, posterior rounded, in the posterodorsal part somewhat truncate. Carapace plano-convex, smooth.

Material. — Thirteen carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/33, Pl. XXXI, Fig. 8; Pl. XXXII, Fig. 3.

Length 0.49, height 0.21.

Description. — Carapace uniformly elongate in outline. The right, larger valve overlaps the left along the ventral and posteroventral margin. Dorsal margin straight, with slightly marked angles at its ends, ventral straight, parallel to dorsal. Anterior end slightly extended in the medial, truncate in the anterodorsal and arcuate in the anteroventral part. Posterior end rounded in the posteroventral and slightly truncate in the posterodorsal part. Carapace plano-convex. A slightly marked posterior ridge occurs on the posterior marginal surface. Surface of carapace smooth.

Remarks. — *Harziella carbonica* n. sp. differs from *H. ornata* Müller-Steffen, 1965 in a lack of ornamentation.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2913 to 3001.

Ostracoda incertae sedis

(Pl. XXXII, Figs 5 a—d)

Material. — Two damaged carapaces.

Dimensions (in mm):

Carapace Z. Pal. No O.VIII/34, Pl. XXXII, Fig. 5.

Length 0.72, height 0.47.

Description. — Carapace suboval in lateral outline. Dorsal margin straight, with an angle at its end. The anterior sector of dorsal margin and considerable part of the anterior end of carapace damaged. Ventral margin convex. Posterior end rounded. Carapace strongly convex in the postero-ventral part and with a sulcus in the dorsomedial part. The entire surface of carapace covered with a very fine reticle. Single, distinct lists, running along the free margin of both valves, are visible in ventral view.

Remarks. — In their lateral outline and the presence of lists, running along the free margin of both valves, here described *Ostracoda* resemble the genus *Ochescapha* Becker, 1965, from which they differ in a distinct sulcus occurring in the dorsomedial part.

Occurrence. — Borehole Rzeczenica 1, Lower Carboniferous, sampling position (in m): 2999.

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JANUSZ BŁASZYK & DANUTA NATUSIEWICZ

MAŁŻORACZKI KARBOŃSKIE Z WIERCEŃ PÓŁNOCNO-ZACHODNIEJ POLSKI

Streszczenie

Praca zawiera opis małżoraczek karbońskich z wierceń: Rzeczenica 1 i Kłanino 1, Północno-Zachodniej Polski (Text-fig. 1), wykonanych przez Przedsiębiorstwo Poszukiwań Naftowych w Pile. Z próbek, których głębokości podane są na profilach stratygraficznych (Text-fig. 2 i 3) wybrano wszystkie małżoraczki, reprezentowane głównie przez panczerzyki oraz nieliczne skorupki prawe i lewe. Opisano 34 gatunki należące do 16 rodzin, 22 rodzajów i 2 podrodzajów, z tego 15 gatunków i 2 podgatunki uznano jako nowe. Zwrócono uwagę na ich znaczenie stratygraficzne. 9 form oznaczono rodzajowo. Przedstawione wnioski paleontologiczne i stratygraficzne autorzy

traktują jako uwagi wstępne. Biorąc pod uwagę zróżnicowanie zespołów małżoraczków występujących w określonym porządku stratygraficznym oraz dane geofizyczne, można postawić tezę, że poszczególne poziomy podane w pracy odpowiadają poszczególnym piętrům karbonu. I tak poziom I wyznaczały piętro turnejskie, poziom II wizeńskie, a poziom III namurskie.

ЯНУШ БЛАШИК & ДАНУТА НАТУСЕВИЧ

КАМЕННОУГОЛЬНЫЕ ОСТРАКОДЫ ИЗ БУРОВЫХ СКВАЖИН
В СЕВЕРО-ЗАПАДНОЙ ПОЛЬШЕ

Резюме

В работе представлено описание остракод из карбона, пройденного буровыми скважинами Жеченица 1 и Кланино 1 в Северо-Западной Польше (фиг. 1). Предприятием нефтяных поисков в Пиле. Из образцов, глубина взятия которых отмечена на стратиграфических профилях (фиг. 2 и 3), были извлечены все остракоды, представленные, главным образом, раковинками и отдельными левыми и правыми створками. Описание охватывает 34 вида, принадлежащие к 16 семействам, 22 родам и 2 под родам, в том числе 15 видов и 2 подвида новые. 9 форм получило определение до рода. Рассматривается стратиграфическое значение найденных остракод и сформулированы предварительные палеонтологические и стратиграфические заключения. На основании закономерной дифференцированности остракодовых сообществ в определенной стратиграфической последовательности, а также учета геофизических данных, можно сделать вывод, что отдельные остракодовые горизонты, описанные в настоящей работе, соответствуют разным ярусам карбона. Итак, горизонт I характеризует турнейский ярус, горизонт II — визейский ярус и горизонт III — намюрский ярус.

EXPLANATION OF PLATES

Abbreviations used in the plate explanation:

C = carapace, RV = right valve, LV = left valve.

Dimensions (in mm) of the individual are given in parenthesis.

Magnifications of all figures — approximately $\times 80$.

Plate XXV

Ochescapha ? subovata n. sp.

Fig. 1. C. (0.60) — holotype: a LV lateral view, b RV lateral view, c dorsal view, d ventral view: Z. Pal. No O.VIII/1, 2980.0 m.

Jardanites reticularis n. sp.

Fig. 2. C. (0.77) — holotype: a LV lateral view, b RV lateral view, c dorsal view, d ventral view: Z. Pal. No O.VIII/2, 2912.0 m.

Kirkbya regularia Croneis & Gale, 1939

Fig. 3. C. (0.85) — a LV lateral view, b RV lateral view, c dorsal view, d ventral view: Z. Pal. No O.VIII/3, 2313.0 m.

Amphissites centronotoides Geis, 1932

Fig. 4. C. (0.51) — a RV lateral view, b LV lateral view; Z. Pal. No O.VIII/4, 2914.0 m.
All borehole Rzeczenica 1, Lower Carboniferous

Plate XXVI

Amphissites centronotoides Geis, 1932

Fig. 1. C. (0.51) — a dorsal view, b ventral view: Z. Pal. No O.VIII/4, 2914.0 m.

Amphissella ? rhomboidalis n. sp.

Fig. 2. C. (0.50) — holotype: a RV lateral view, b LV lateral view, c dorsal view, d ventral view: Z. Pal. No O.VIII/5, 2990.0 m.

Moorites cf. *brevis* Cooper, 1941

Fig. 3. C. (0.43) — a RV lateral view, b LV lateral view, c dorsal view, d ventral view: Z. Pal. No O.VIII/6, 2902.3 m.

Hypotetragona acuta n. sp.

Fig. 4. C. (0.60) — holotype: a RV lateral view, b LV lateral view, c dorsal view, d ventral view: Z. Pal. No O.VIII/7, 2914.0 m.

Glyptopleura klanensis n. sp.

Fig. 5. C. (0.89) — holotype: a RV lateral view, b LV lateral view, c ventral view: Z. Pal. No O.VIII/8, 2397.0 m.

Paraparchites cf. *harltoni* Bradfield, 1935

Fig. 6. C. (0.38) — a dorsal view: b ventral view: Z. Pal. No O.VIII/11, 2922.0 m.

Figs 1—4, 6 Borehole Rzeczenica 1, Lower Carboniferous; Fig. 5 borehole Kłanino 1.
Carboniferous.

Plate XXVII

Glyptopleura klanensis n. sp.

Fig. 1. C. (0.89) — holotype: dorsal view: Z. Pal. No O.VIII/8, 2397.0 m.

Paraparchites cf. harltoni Bradfield, 1935

Fig. 2. C. (0.38) — *a* RV lateral view, *b* LV lateral view: Z. Pal. No O.VIII/11, 2922.0 m.

Beyrichiopsis binodosus n. sp.

Fig. 3. C. (0.71) — holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/9, 2395.0 m.

Sansabella polonica n. sp.

Fig. 4. C. (0.77) — holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/10, 3002.0 m.

Paraparchites ? pilensis n. sp.

Fig. 5. C. (0.80) — holotype: *a* LV lateral view, *b* dorsal view: Z. Pal. No O.VIII/12, 2911.9 m.

Figs. 1, 3. Borehole Kłanino 1, Carboniferous; Figs 2, 4, 5 borehole Rzeczenica 1; Lower Carboniferous.

Plate XXVIII

Paraparchites ? pilensis n. sp.

Fig. 1. C. (0.80). holotype: *a* RV lateral view, *b* ventral view: Z. Pal. No O.VIII/ 12, 2911.9 m.

Paraparchites pomeranensis n. sp.

Fig. 2. C. (0.72) holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/13, 2930.0 m.

Paraparchites sp.

Fig. 3. C. (0.51) — *a* RV lateral view, *b* LV lateral view, *c* ventral view, *d* dorsal view: Z. Pal. No O.VIII/14, 2913.0 m.

Bairdia (Bairdia) turgida n. sp.

Fig. 4. C. (0.93) holotype: *a* RV lateral view, *b* ventral view: Z. Pal. No O.VIII/15, 2913.0 m.

All borehole Rzeczenica 1, Lower Carboniferous.

Plate XXIX

Bairdia (Bairdia) turgida n. sp.

Fig. 1. C. (0.93) holotype: *a* LV lateral view, *b* dorsal view: Z. Pal. No O.VIII/15, 2913.0 m.

Acratia cf. magna Delo, 1930

Fig. 2. C. (0.92) — *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/16, 2964.0 m.

Acratia sp.

Fig. 3. C. (0.38) — *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/17, 2946.0 m.

Healdia edwinelli n. sp.

Fig. 4. C. (0.52) — holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view: Z. Pal. No O.VIII/21, 2896.0 m.

Hastacypris sp.

Fig. 5. C. (0.45) — RV lateral view: Z. Pal. No O.VIII/18, 2910.0 m.
All borehole Rzeczenica 1, Lower Carboniferous.

Plate XXX

Healdia cf. *tenuicostata* Cooper, 1941

Fig. 1. C. (0.79) — *a* LV lateral view, *b* RV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/19, 2978.0 m.

Healdia cf. *fayettevillensis* Harlton, 1929

Fig. 2. C. (0.72) — *a* RV lateral view, *b* LV lateral view, *c* ventral view, *d* dorsal view: Z. Pal. No O.VIII/20, 2987.0 m.

Healdia edwinelli n. sp.

Fig. 3. C. (0.52) — holotype: ventral view: Z. Pal. No O.VIII/21, 2896.0 m.

Healdia longula fibularis n. subsp.

Fig. 4. C. (0.60) — holotype: *a* RV lateral view, *b* LV lateral view, *c* ventral view, *d* dorsal view: Z. Pal. No O.VIII/22, 2912.0 m.

All borehole Rzeczenica 1, Lower Carboniferous.

Plate XXXI

Healdia simplex trigonata n. subsp.

Fig. 1. C. (0.63) — holotype: *a* RV lateral view, *b* LV lateral view, *c* ventral view, *d* dorsal view: Z. Pal. No O.VIII/23, 2935.0 m.

Healdia sp.

Fig. 2. (0.47) — LV lateral view: Z. Pal. No O.VIII/24, 2902.0 m.

Cribroconcha sp.

Fig. 3. (.025) — RV lateral view: Z. Pal. No O.VIII/25, 2912.0 m.

Waylandella sp.

Fig. 4. (0.50) — LV lateral view: Z. Pal. No O.VIII/26, 2910.0 m.

Bairdiocypris guttaeformis n. sp.

Fig. 5. C. (0.43) — holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/27, 2897.0 m.

Genus et species indet.

Fig. 6. C. (0.67) — *a* RV lateral view, *b* LV lateral view, *c* ventral view, *d* dorsal view: Z. Pal. No O.VIII/28, 2625.0 m.

Microcheilinella asymmetrica n. sp.

Fig. 7. C. (0.42) — holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/30, 2935.0 m.

Harziella carbonica n. sp.

Fig. 8. C. (0.49) — holotype: ventral view: Z. Pal. No O.VIII/33, 2921.0 m.

Figs 1—5, 7, 8 borehole Rzeczenica 1; Fig. 6 borehole Kłanino 1; Lower Carboniferous.

Plate XXXII

Mircocheilinella brdensis n. sp.

Fig. 1. C. (0.42) — holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/29, 3000.0 m.

Microcheilinella sp.

Fig. 2. C. (0.47) — *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/31, 2912.0 m.

Harziella carbonica n. sp.

Fig. 3. C. (0.49) — holotype: *a* RV lateral view, *b* LV lateral view, *c* dorsal view: Z. Pal. No O.VIII/33, 2921.0 m.

Richterina (Richterina) striatula (Richter) 1848

Fig. 4. C. (1.01) — *a* LV lateral view, *b* dorsal view: Z. Pal. No O.VIII/32, 2935.0 m.

Ostracoda incertae sedis

Fig. 5. C. (0.72) — *a* RV lateral view, *b* LV lateral view, *c* dorsal view, *d* ventral view: Z. Pal. No O.VIII/34, 2999.0 m.

All borehole Rzeczenica 1, Lower Carboniferous.

