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Lower Cambrian and its trilobites in the Holy Cross Mts

ABSTRACT: The new collection of the Lower Cambrian trilobites allows to revise the whole trilobite fauna from the Holy Cross Mountains, Central Poland. For a few species either a supplementary description or a new taxonomical assignation is presented. The following genera and species are described as new: *Postfallotaspis spinatus* gen. et sp. n., *Elatius integer* gen. et sp. n., *Schmidtiellus nodosus* sp. n., *Strenuella zbelutkae* sp. n., *Comluella oratrix* sp. n., *Comluella igrzycznae* sp. n., *Ellipsocephalus simplex* sp. n., *Micmacca (Acanthomicmacca) klimontowi* sp. n., *Strenuaeva trifida* sp. n., *Protolenus (Protolenus) expectans* sp. n., *Protolenus (Latoucheia) glabellosus* sp. n., and *Serrodiscus primarius* sp. n.

INTRODUCTION

An advanced progress in researches on the stratigraphy and paleontology of the Lower Cambrian of the Holy Cross Mountains, Central Poland, has recently resulted in a subdivision of the sequence into formal lithostratigraphic units (ORŁOWSKI 1975b), description of some trilobites and of an associated aglaspid (ORŁOWSKI 1974, 1975a, 1983), as well as of some trace fossils (KOWALSKI 1983).

The collection of trilobites has also been enlarged, and the specimens have been collected both by the author of this paper and by his students during their fieldwork. The new collection of trilobites, together with the older materials have made a basis for a revision of the earlier described species (SAMSONOWICZ 1959a, b, c, 1962; ORŁOWSKI 1974, 1975a). The newly astablished genera and species of trilobites complete the list of the hitherto recognized taxa, and of the time intervals of the occurrence of particular species in the Holy Cross region (*see* Text-fig. 1).

STRATIGRAPHY

The four biostratigraphic Zones: Sabellidites, Platysolenites, Holmia, and Protolenus, were recognized in the Lower Cambrian of the Holy Cross area (ORŁOWSKI 1974, 1975b; KOWALSKI 1983). The oldest two Zones are documented both

by the index fossils and by the other fossils belonging to Acritarcha, Vendotaenidae, and Hyolitha, the stratigraphic significance of which is still however discussed.

In the Holmia and Protolenus Zones the trilobites are common, the index species including, which are associated with brachiopods, hyolithids, and gastropods.

The four lithostratigraphic formations were established within the Lower Cambrian of the investigated area (ORŁOWSKI 1975b, KOWALSKI 1983), as follows.

The *Osiek Sandstone Formation* is known mainly from borings, because the outcrops are few and small. The formation is represented by yellow and light-gray quartz sandstones and dark-gray quartzitic sandstones; the thickness probably does not exceed 30 m. No fossils were found in sandstones, but some trace fosils (*Planolites* and *Phycodes*) were mentioned by KOWALSKI (1983).

The *Czarna Shale Formation* consists of clay and siltstone shales with intercalations of fine-grained siltstones and sandstones; the sandstone intercalations increase in number toward the top of the formation. The thickness is difficult to recognize because of intense foldings and the coverage by marine Miocene deposits; it may be estimated as 500 to 700 m at least, but it may be even more than 2000 m. Within the formation some Acritarcha were found (KOWALSKI 1983), and the skeletal fauna is represented by *Coleoloides* sp., *Sabellidites cambriensis* YANISCHEVSKY, *Tyrasotenia podolica* GNILOVSKAJA, *Pilitela composita* ASEEVA, *Vendotaenia major* KOWALSKI, *Thallulus carnosus* KOWALSKI, all reported by KOWALSKI (1983), and by *Platysolenites antiquissimus* EICHWALD. From the borehole Bazów, situated in the upper part of the formation such fossils as *Prosinuites bornholmiensis* C. POULSEN, *Hyolithes* sp., *Aluta* sp., and *Bradoria* sp. were described by LENDZION & *al.* (1982).

The *Ociesęki Sandstone Formation* consists of fine-grained, thin- to medium-bedded, hard sandstones, with siltstone and occasionally shale intercalations. The thickness of the formation is greatest in the middle part of this area where it is estimated at 600 m. The body fossils are very common, especially the trilobites, while less common are brachiopods and hyolithids, and quite rare are gastropods. The trace fossils are very common, rich in ichnogenera and well preserved, the large group of which was produced by trilobites (ichnogenera *Cruziana*, *Rusophycus*, *Diplichnites*, *Dimorphichnus*, *Monomorphichnus*). The ichnocoenoses of this formation point its belonging to the *Cruziana* ichnofacies, and thus the formation is recognized as deposited in a neritic zone.

The *Kamieniec Shale Formation* is limited to the eastern Holy Cross region, and it is represented by clay and clay-siltstone shales with fine-grained sandstone intercalations. The thickness of the formation is up to 200 m. The trilobites are less abundant, but all are characteristic of the Protolenus Zone. The trace fossils (ichnogenera *Planolites*, *Phycodes*, *Bergaueria*) are rare.

PALEONTOLOGICAL REMARKS

Lower Cambrian trilobites of the investigated area (*see* Text-fig. 1) occur commonly in sandstones, but they are rare in siltstones and shales. All the trilobites are well preserved as inner and outer casts; as a rule, the carapaces are disintergrated, while larger fragments of carapaces or even whole carapaces can occasionally also be found.

Associated with the oldest trilobites is an aglaspid, *Paleomerus makowskii* ORŁOWSKI, 1983.

The systematic classification used in this paper is the same as in the *Treatise on Invertebrate Paleontology* (Part **0**, Arthropoda *1*, edited in 1959), with some modifications proposed earlier by HUPÉ (1953). The genera *Strenuella* and *Com-*

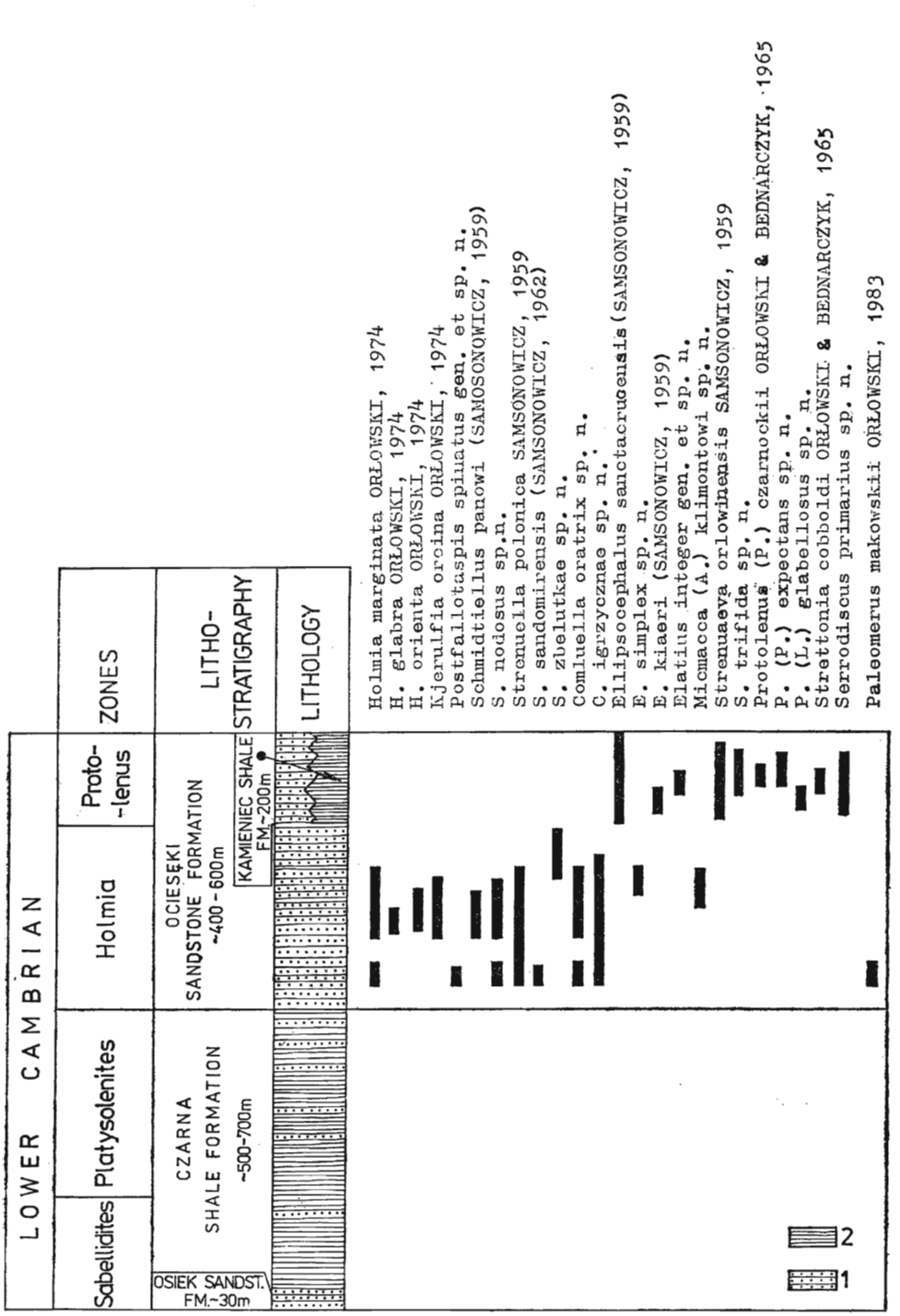

Fig. 1. Stratigraphy, trilobites and the aglaspid of the Lower Cambrian in the Holy Cross Mountains

1 — sandstones, 2 — shales

luella are treated as independent; the latter genus is recognized after a posteriorly rounded occipital ring, and a very weak (sometimes missing) anterior border.

Within the genus *Protolenus* the two subgenera are used: *Protolenus (Protolenus)* characteristic by the smooth carapace, and *Protolenus (Latoucheia)* with a granulose surface of the carapace.

The investigated species of the genus *Ellipsocephalus* are stated to occur both in the Holmia and Protolenus Zones.

The new genus *Postfallotaspis* was numbered in the subfamily Fallotaspidae.

The collection of the investigated Lower Cambrian trilobites counts about 1000 specimens; the biggest part of the collection is kept in the Institute of Geology, University of Warsaw. Some specimens of *Ellipsocephalus kiaeri* (SAMSONOWICZ, 1959), *Protolenus (Protolenus) czarnockii* ORŁOWSKI & BEDNARCZYK, 1965, *Strettonia cobboldi* ORŁOWSKI & BEDNARCZYK, 1965, are housed at the Museum of the Geological Survey of Poland.

The geological maps of the Lower Cambrian with location of the most important outcrops were presented in other papers (SAMSONOWICZ 1959a, 1962; *and* ORŁOWSKI 1974).

SYSTEMATIC ACCOUNT

Family **Olenellidae** VOGDES, 1893
Genus *Kjerulfia* KIAER, 1916
Kjerulfia orcina ORŁOWSKI, 1974
(Text.fig. 2 and Pl. 1, Figs 5—6)

1974. *Kjerulfia orcina* sp. n.; S. ORŁOWSKI, pp. 13—15, Pl. 3, Figs 4—5; Pl. 4, Figs 1—8; Pl. 5, Figs 1—5.

ADDITIONAL DESCRIPTION: The features of the cephalon are the same (*see* Text-fig. 2) as formerly stated. A new specimen containing the anterior and middle parts of thorax with 11 segments is the outer cast with preserved ornamentation. Its axial and pleural parts to the level

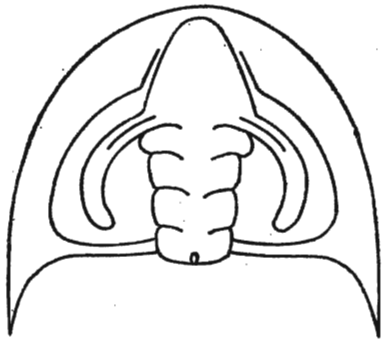

Fig. 2
Kjerulfia orcina ORŁOWSKI, 1974

(*tr.*) of outer ends of pleural furrows are covered by irregular, small meshes. Outer part of pleurae and pleural spines are covered by irregular lines, at the beginning directed transversally and laterally, and outwards they are situated obliquely to the margin of pleurae.

Genus *Postfallotaspis* gen. n.
Type species: *Postfallotaspis spinatus* gen. et sp. n.

DERIVATION OF THE NAME: From Latin *post* — after its age younger than *Fallotaspis*.

DIAGNOSIS: Cephalon semioval, broader than long, convex. Glabella conical, rounded anteriorly; occipital ring elevated with high and sharp, large spine; occipital furrow long (*sag.*) on sides, shallow, not jointed across; three pairs of shallow lateral glabellar furrows are present. Glabella separated from the anterior border by short (*sag.*) preglabellar field. Palpebral lobes distinct, situated near glebella and directed to the anterior lobe of glabella. Border of cephalon rather narrow, weakly marked on lateral sides, convex in the frontal part, upturned before glabella, and on sides it continues into genal spines.

DISCUSSION: The subfamily Fallotaspidinae was established by HUPÉ (1952) on the basis of the genus *Fallotaspis*, described from the Lower Cambrian of Morocco. Later, trilobites belonging to this subfamily were described from Siberia, California and Canada. REPINA (1979) proposed to establish the range of the taxon on the family level, as the Fallotaspididae HUPÉ, 1952; she includes into this taxon the following genera: *Fallotaspis* HUPÉ, *Profallotaspis* REPINA, *Parafallotaspis* FRITZ, *Fallotaspidella* REPINA, ?*Poletaevella* DALM. & REPINA. The list of such genera is to be enriched by the genus *Postfallotaspis* gen. n. Nevertheless, the author remains all these genera in the family Olenellidae VOGDES.

Postfallotaspis spinatus sp. n.
(Text-fig. 3 and Pl. 3, Fig. 5)

HOLOTYPE: Cephalon (specimen No. 1.496), presented in Pl. 3, Fig. 5.
TYPE LOCALITY: Igrzyczna Hill.
TYPE HORIZON: Lower Cembrian, Holmia Zone, Ociesęki Sandstone Formation.
DERIVATION OF THE NAME: From Latin *spinatus* — after the presence of spines on the posterior margin of cephalon.
MATERIAL: Large cephalon, partly preserved.

DIAGNOSIS: Cephalon semioval, convex with long (*sag.*) conical glabella, separated from the anterior border by short (*sag.*) preglabellar field; occipital ring elevated with occipital spine; posterior margin with metagenal spines.

DESCRIPTION: Cephalon semioval, convex, about twice broader than long on the level of occipital ring. Glabella conical, rounded anteriorly, reaching about 6/7 of cephalon length. Three pairs of shallow but broad lateral furrows; *L3* broader (*tr.*) than other glabellar lobes, bent anteriorly (*see* Text-fig. 3). Occipital ring broad (*tr.*), elevated, with a large, massive and high spine, directed

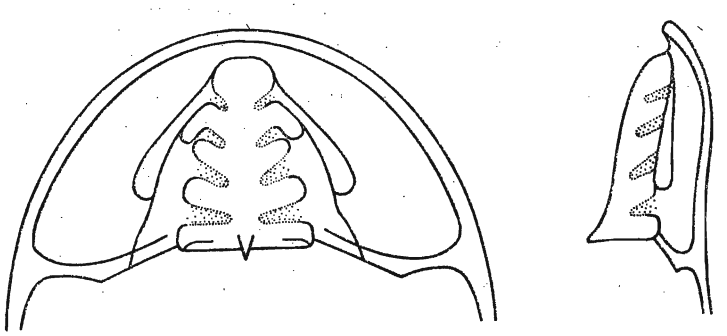

Fig. 3. *Lostfallotaspis spinatus* gen. et sp. n.

backwardly. Two short but distinct furrows present on the occipital ring. Occipital furrow long (*exsag.*) and deep but only on sides, it does not joint across the glabella. Palpebral lobes slightly curved, situated near glabella, terminating opposite *L1*, and directed to the anterior lobe of glabella, jointed with glabella. Border of cephalon rather narrow, weakly marked on lateral sides, distinct in frontal part and before glabella upturned; border is prolongated into general spines. Posterior margin composed, from glabella directed laterally-backwards, next slightly anteriorly bent and directed to the general spine. Metagenal spine distinct, situated near the general spine. Thorax and pygidium unknown.

Genus *Holmia* MATTHEW, 1890
Holmia marginata ORŁOWSKI, 1974
(Text-fig. 4 and Pl. 1, Figs 1—4)

1974. *Holmia kjerulfi marginata* subsp. n.; S. ORŁOWSKI, pp. 8—10, Pl. 1, Figs 1—4; Pl. 2, Figs 1—6.

MATERIAL: Cephalon with partly preserved thorax, three partly preserved thoraxes, over thirty cephala, some hypostomata, and numerous fragments of pleurae, thoracic segments and extraocular cheeks.

DESCRIPTION: Cephalon semioval, convex, cephalic border broad, convex, distinct, narrower before the glabella. Cephalic border furrow distinct. Glabella elongated, reaching almost cephalic border, frontal lobe much broader (*tr.*) than the other lobes. Occipital ring with small node near the posterior margin; *L1* long (sag.), *L2* and *L3* shorter but broader (*tr.*); *S0* and *S1* short, *S2* and *S3* longer. Palpebral lobes very big, bilobated, strongly curved outside, reaching below the level of occipital furrow. Extraocular cheek narrow (*tr.*). Genal spines long, convex, slightly narrowing posteriorly. Posterior margin directed slightly backward from the glabella, and toward the genal spine slightly bent anteriorly. Short and sharp metagenal spines present; metagenal ridges exist, directed from the level of occipital furrow outward-backwards (*see* Text-fig. 4).

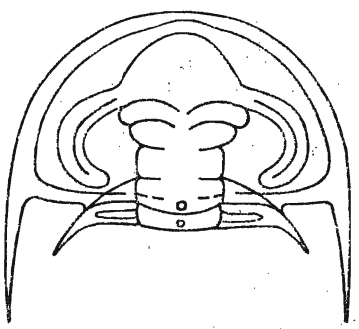

Fig. 4
Holmia marginata ORŁOWSKI, 1974

Duplicatura covered by longitudinal striae. Hypostoma strongly convex, with anterior wings; posterior part is short and narrower (*tr.*), separated from the anterior part by transverse furrow; maculae are present. Thorax narrower than cephalon, narrowing slightly posteriorly. Pleurae with distinct, horizontal pleural furrows and with sharp spines directed outward-backwards. Small spines are situated on the axial rings. Only a part of thorax with 9 segments is known.

DISCUSSION: Many well preserved specimens were found in last years. The diagnostic features are very distinct and they decided to put the taxon on the level of species instead of subspecies, as it was previously given (ORŁOWSKI 1974).

The species *Holmia marginata* differs from *Holmia kjerulfi* (LINNARSSON, 1871) in a more distinct, convex cephalic border; the border furrow is also distinct, and glabella is narrower with

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PLATE 1

Holmia marginata ORŁOWSKI, 1974

1-3 — Cephala (Nos 1.487, 1.476, 1.465), × 2; Igrzyczna Hill

4 — Cephalon with part of thorax (No. 1.466), and free hypostoma (*arrowed*), × 2; Igrzyczna Hill

Kjerulfia orcina ORŁOWSKI, 1974

5 — Half of cephalon (No. 1.94), × 2; Igrzyczna Hill

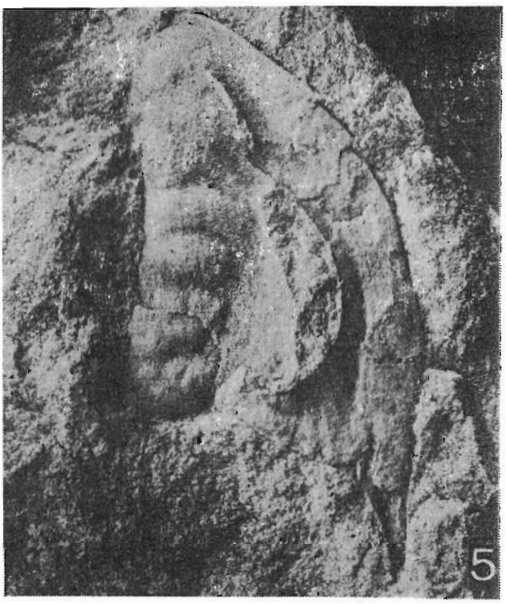
6 — Outer cast of 10 thoracic segments with ornamentation (No. 1.511), nat. size; Sterczyna Hill

Photos taken by S. ULATOWSKI


1


2


3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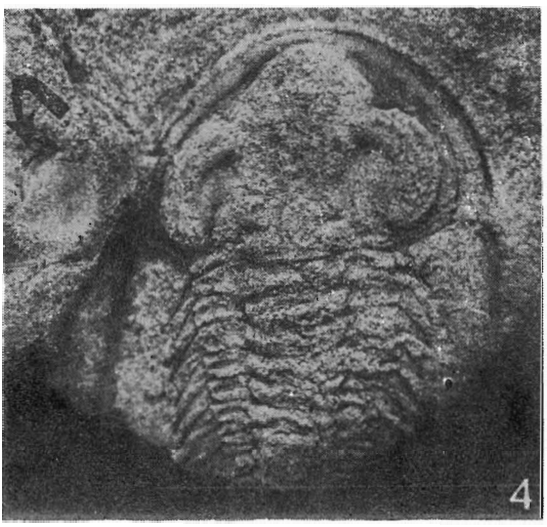
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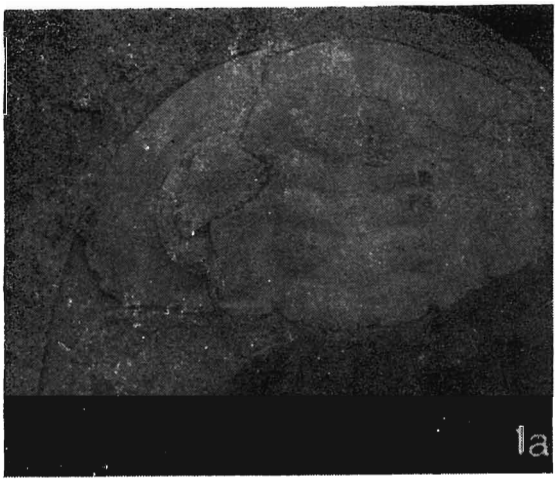

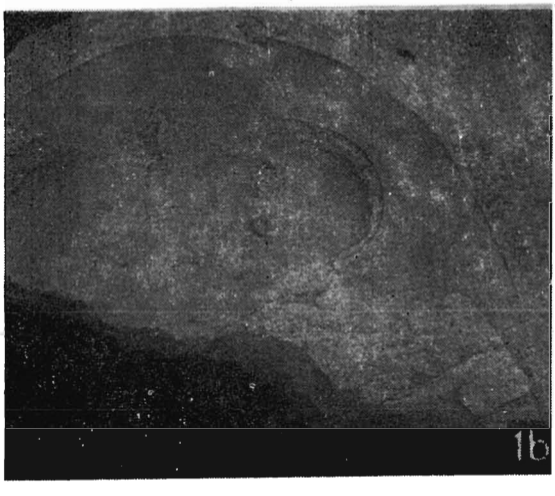

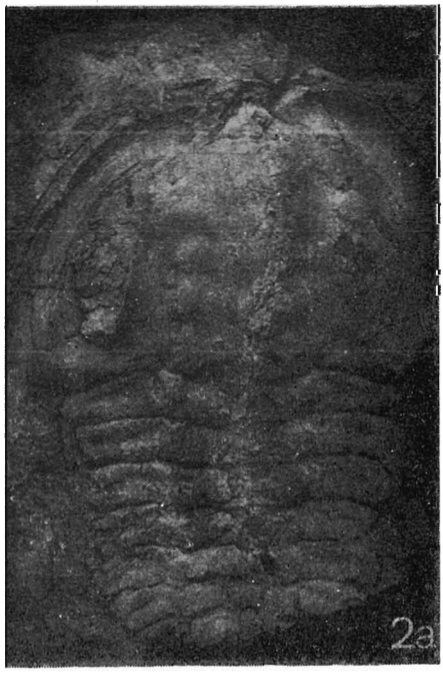

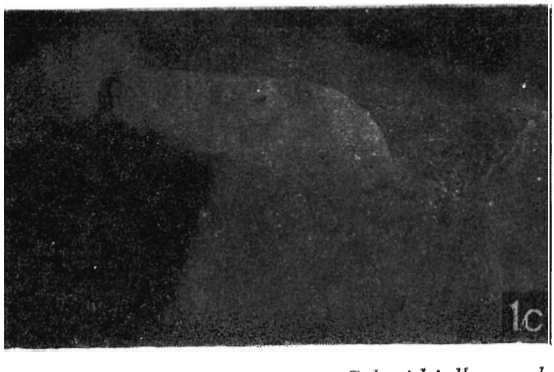

Schmidtiellus nodosus sp. n.

1a-1c — Partly preserved cephalon (No. 1.349 — holotype): *1a* inner cast, *1b* outer cast, *1c* lateral view, all × 2; Malkowska Hill

2a-2b — Cephalon with part of thorax (No. 1.356): *2a* inner cast, *2b* latex cast, nat. size; Ignacyca-na Hill

Photos taken by S. ORŁOWSKI

occipital node instead of occipital spine. Palpebral lobes are broader (*tr.*), longer and bilobated, extraccular cheek is narrower (*tr.*), genal spines are longer.

From *Holmia glabra* ORŁOWSKI, 1974, the new species differs in narrower glabella, longer (*exsag.*) and bilobated palpebral lobes, shorter (*sag.*) cephalic border before the glabella and shorter pleural spines.

From *Holmia orienta* ORŁOWSKI, 1974, the new species differs in broader frontal lobe of glabella, narrower cephalon, narrower extraocular cheek, posterior margin, and in the shape of pleurae.

From *Holmia mobergi* BERGSTRÖM, 1973, the new species differs in the shape of cephalon, narrower posterior part of glabella, broader frontal lobe of glabella, bigger palpebral lobes, and different posterior margin of cephalon.

Genus *Schmidtiellus* MOBERG, 1906
Schmidtiellus panowi (SAMSONOWICZ, 1959)
(Text-fig. 5 and Pl. 3, Fig. 4)

1974. *Schmidtiellus panowi* (SAMSONOWICZ, 1959); S. ORŁOWSKI, pp. 7—8, Pl. 1, Figs 5—6.

ADDITIONAL DESCRIPTION: Some new fragments of carapace were found, and one of them is a badly preserved specimen with an almost complete cephalon and 7 thoracic segments. Cephalon semioval, with convex glabella; large spine situated on occipital ring. Extraocular cheek

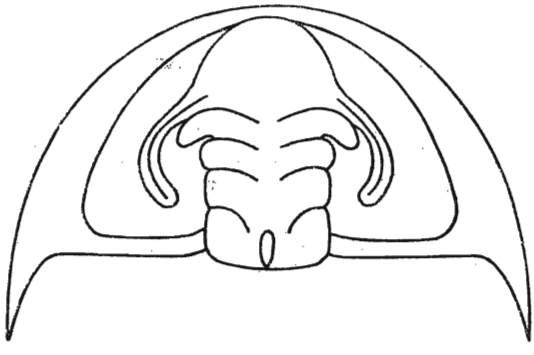

Fig. 5. *Schmidtiellus panowi* (SAMSONOWICZ, 1959)

broad (*tr.*) with broad and flat cephalic border; genal spine short, sharp, flat (*see* Text-fig. 5). Thorax much narrower than cephalon, axial region and pleural regions with similar broadness. Small spines are situated on each axial ring.

Schmidtiellus nodosus sp. n.
(Text-fig. 6 and Pl. 2, Figs 1—2; Pl. 3, Figs 2—3)

HOLOTYPE: Cephalon (specimen No. 1.349), presented in Pl. 2, Fig. 1.
TYPE LOCALITY: Malkowska Hill.
TYPE HORIZON: Lower Cambrian, Holmia Zone, Ociesęki Sandstone Formation.
DERIVATION OF THE NAME: Latin *nodus* — after having a small node on the occipital ring.
MATERIAL: Three complete cephala, two cephala with eight thoracic segments each, some fragments of carapace.

DIAGNOSIS: A *Schmidtiellus* with long glabella, large palpebral lobes reaching at least to the level of occipital furrow; either a small node or spine is situated near the posterior margin of the occipital ring.

DESCRIPTION: Cephalon semioval, moderaterly convex; cheeks with genal spines; posterior margin straight or slightly bent in older specimens, with small metagenal node. Glebella paralell--sided, long, rounded anteriorly, with frontal lobe convex. Occipital ring with a small node. or

a spine in older specimens, is situated near the posterior margin. Three glabellar lobes and the frontal lobe; *L1* is the longest (*sag.*). Three pairs of lateral glabellar furrows bent anteriorly, almost joining across the glabella. Occipital furrow deeper laterally. Palpebral lobes large, reaching the level of occipital furrow in younger specimens and behind the level in older specimens. Palpebral area is about 3/4 broad as glabella. Metagenal ridge directed from occipital furrow outward-backwards to the posterior margin. Extraocular cheek narrower, with broad (*tr.*), flat cephalic border; the border narrow in front of glabella. Cephalic border prolongated in genal spines, flat, and sharp (*see* Text-fig. 6). Cephalic border is covered by a pattern of delicate lines arranged parallelly to

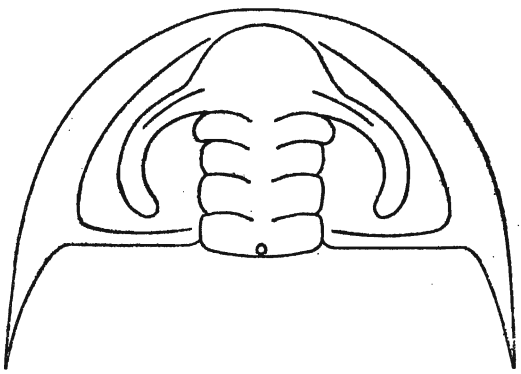

Fig. 6. *Schmidtiellus nodosus* sp. n.

the border. Thorax is partly preserved, and eight segments are visible. Thorax is narrower than cephalon. Pleural parts narrower than axial part. Pleurae with spines directed backwards. Small but sharp spines are situated on each thoracic rings near the posterior margin. An exact number of thoracic segments and pygidium unknown.

DISCUSSION: The new species differs from *Schmidtiellus panowi* (SAMSONOWICZ, 1959) in more regular glabella, shorter (*sag.*) frontal lobe, small node or spine on the occipital ring, and bigger palpebral lobes.

From *Schmidtiellus mickwitzi torelli* (MOBERG, 1899) the new species differs in much broader (*tr.*) cephalic border, small occipital node instead of occipital spine, and broader thoracic region.

From *Schmidtiellus reetae* BERGSTRÖM, 1973, the new species differs in narrower extraocular cheek, narrower cepahlic border, occipital node instead of occipital spine.

Family **Ellipsocephalidae** MATTHEW, 1887
Genus *Ellipsocephalus* ZENKER, 1833
Ellipsocephalus sanctacrucensis (SAMSONOWICZ, 1959)
(Pl. 7, Fig. 4)

1975. *Ellipsocephalus sanctacrucensis* (SAMSONOWICZ, 1959); S. ORŁOWSKI, pp. 369—374, Pl. 1, Figs 1—6; Pl. 2, Figs 1—10; Pl. 3, Figs 1—8; Pl. 4, Fig. 1.

REMARKS: This species was detaily described earlier (ORŁOWSKI 1975) but still new, well preserved specimens are collectable; some of them are enrolled. The specimen illustrated herein (Pl. 7, Fig. 4) is an almost complete carapace (55 mm long) with 13 thoracic segments, but devoid of pygidium and librigenae.

HORIZON and LOCALITY: The species is known mainly from the Zamczysko Hill and it is characteristic of the Protolenus Zone; usually it is associated with *Strenuaeva orlowinensis* SAMSONOWICZ, 1959.

Ellipsocephalus kiaeri (SAMSONOWICZ, 1959)
(Text-fig. 7 and Pl. 7, Fig. 2)

1959. *Strenuaeva kiaeri* (CZARNOCKI); J. SAMSONOWICZ, p. 523, Pl. 1, Fig. 16.

ADDITIONAL DESCRIPTION: Cranidium broader than long, evenly arched, with weakly impressed axial furrows. Glabella broad (*tr.*), flat, parallel-sided, anterior part triangular, without lateral glabellar furrows. Occipital ring short (*sag.*), occipital furrow shallow but distinct. Fixigenae slightly lowering outside; palpebral lobe very small. Preglabellar field separated from the glabella and fixigenae by a shallow furrow; anterior branch of facial suture parallel (*see* Text-fig. 7).

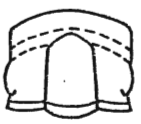

Fig. 7
Ellipsocephalus kiaeri (SAMSONOWICZ, 1959)

REMARKS: The history of this species, known from one specimen, was discussed by SAMSONOWICZ (1959b).

HORIZON and LOCALITY: Lower Cambrian, Protolenus Zone, Chojny ravine near the village Radostów, south of Łagów.

Ellipsocephalus simplex sp. n.
(Text-fig. 8 and Pl. 7, Fig. 3)

HOLOTYPE: Cranidium (specimen No. 1.443), presented in Pl. 7, Fig. 3.
TYPE LOCALITY: Outcrop Kucebrza near Klimontów.
TYPE HORIZON: Lower Cambrian, Holmia Zone.
DERIVATION OF THE NAME: Latin *simplex* — after a very simple morphology of cranidium.
MATERIAL: One cranidium.

DIAGNOSIS: An *Ellipsocephalus* with short glabella and very long preglabellar field.

DESCRIPTION: Cranidium slightly convex, rounded anteriorly; axial furrows parallel, shallow but distinct. Glabella reaching about 2/3 of cranidium length, parallel-sided, rounded anteriorly, without lateral glabellar furrows. Occipital ring short, rounded posteriorly; occipital furrow shallow. Fixigenae narrower than glabella, lowering from the glabella outside. Palpebral lobe short, reaching about a half of the glabella length. Preglabellar field long, flat, slihgtly lowering anteriorly. Anterior branch of facial sutere much longer than the posterior one, and directed anteriorly (*see* Text-fig. 8). Librigenae, thorax and pygidium unknown.

Fig. 8
Ellipsocephalus simplex sp. n.

DISCUSSION: The new species differs from *Ellipsocephalus kiaeri* (SAMSONOWICZ, 1959) in shorter glabella, rounded frontal part of glabella, longer preglabellar field, and longer anterior branch of facial suture.

The new species differs from *Ellipsocephalus sanctacrucensis* (SAMSONOWICZ, 1959) in shorter but much distinct glabella, shorter occipital ring, and less convex cranidium.

Genus *Elatius* gen. n.
Type species: *Elatius integer* gen. et sp. n.

DERIVATION OF THE NAME: From Latin *elatio* — after transformation of glabella into a preglabellar field.

DIAGNOSIS: Cranidium moderately convex, almost as broad as long, rounded anteriorly, with axial furrows distinct, and in the front of glabella directed antero-laterally. Glabella parallel-sided, without lateral glabellar furrows, merging anteriorly with preglabellar field; occipital ring long (*sag.*). Fixigenae moderately inflated, anterior branch of facial suture slightly divergent.

DISCUSSION: The new genus belongs to the family Ellipsocephalidae because of the shape of cranidium and an elongated, parallel-sided, smooth glabella; it is near to the genus *Ellipsocephalus*. The most characteristic feature of the new genus is a lack of the preglabellar furrow and, in result of this, the anterior part of the glabella merges with the preglabellar field; anterior part of axial furrows directed antero-laterally. A similar shape of axial furrows on the cranidium is known in the genus *Phoreotropsis* RAYMOND, 1924, from the Upper Cambrian of North America. The posterior margin, occipital ring and anterior branch of facial suture are rather similar to those of *Strenuaeva* and *Comluella*.

OCCURRENCE: Lower Cambrian, Protolenus Zone,, Holy Cross Mountains.

Elatius integer sp. n.
(Text-fig. 9 and Pl. 7, Fig. 1)

HOLOTYPE: Cranidium (specimen No. *Cd* 3), presented in Pl. 7, Fig. 1.
TYPE LOCALITY: Ravine Chojnów Dół, south of Łagów.
TYPE HORIZON: Lower Cambrian, Protolenus Zone, Ociesęki Sandstone Formation.
DERIVATION OF THE NAME: Latin *integer* — after having glabella jointed with the preglabellar field.
MATERIAL: Two cranidia as inner and outer casts.

DIAGNOSIS: Cranidium convex, rounded anteriorly, glabella parallel-sided, without lateral glabellar furrows, merging with the preglabellar field.

DESCRIPTION: Cranidium moderately convex, rounded anteriorly, almost as long as broad, with distinct axial furrows. Glabella smooth, parallel-sided, broader than fixigenae; occipital ring long, rounded posteriorly; occipital furrow shallow, but distinct, straight. Glabella merging anteriorly with preglabellar field, which is smooth and lowering gradually forward. Anterior part of axial furrows divergent antero-laterally in some distance (*see* Text-fig. 9). Fixigenae slightly convex

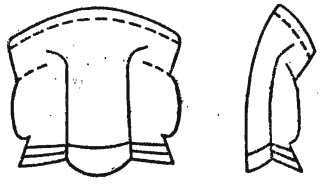

Fig. 9
Elatius integer gen. et sp. n.

smooth, separated from the preglabellar field by a shallow furrow. Palpebral lobe weakly impressed, reaching about a half of the glabella length. Posterior margin straight but directed slightly backward; posterior margin furrow distinct but shallow. Anterior branch of facial suture longer than the posterior one, slightly divergent. Librigenae, thorax and pygidium unknown.

Genus *Strenuaeva* RICHTER & RICHTER, 1940
Strenuaeva orlowinensis SAMSONOWICZ, 1959
(Pl. 6, Fig. 7)

1959. *Strenuaeva orlowinensis* (CZARNOCKI); J. SAMSONOWICZ, pp. 522—523, Pl. 1, Figs 10—15.

MATERIAL: 8 cranidia.

DESCRIPTION: Cranidium longer than broad, convex, with prominent axial furrows. Glabella convex, reaching about 2/3 of cranidium length, narrow, blunt in the front; three pairs of lateral glabellar furrows. Occipital ring long, rounded posteriorly, occipital furrow distinct. Pre-

glabellar field inflated, anterior margin of cranidium bent anteriorly and almost triangular; preglabellar furrow long (*sag.*) and extended toward sides. Fixigenae inflated; palpebral lobes long (*exsag.*). Anterior branch of facial suture divergent.

REMARKS: SAMSONOWICZ when describing the history of the species, proposed as the neotype a cranidium (SAMSONOWICZ 1959b, Pl. 1, Fig. 15a—c) which, however, is tectonically deformed. It seems therefore reasonable to demonstrate an underformed cranidium, which well illustrates all the specific features (*see* P. 6, Fig. 7; the specimen figured formerly by SAMSONOWICZ 1959b, Pl. 1, Fig. 14).

Strenuaeva trifida sp. n.
(Text-fig. 10 and Pl. 6, Figs 8—9)

HOLOTYPE: Cranidium (specimen No. 1.538), presented in Pl. 6, Fig. 8.
TYPE LOCALITY: Unnamed hill south of the village Wola Jastrzębska, south of Łagów.
TYPE HORIZON: Lower Cambrian, Protolenus Zone, Kamieniec Shale Formation.
DERIVATION OF THE NAME: Latin *trifida* — after having a preglabellar furrow divided into three parts.
MATERIAL: 23 cranidia presented as inner and outer casts.

DIAGNOSIS: A *Strenuaeva* with inflated preglabellar field, distinct preglabellar furrow divided into three parts, and with a short (*sag.*) occipital ring.

DESCRIPTION: Cranidium convex, rounded anteriorly, with axial furrows prominent and deeply impressed; glabella prominent reaching about 2/3 of cranidium length, narrowing slightly anteriorly; anterior part rounded or almost tapering. Occipital ring short (*sag.*), rounded posteriorly; occipital furrow distinct. Three pairs of short lateral glabellar furrows are present (*see* Text-fig. 10).

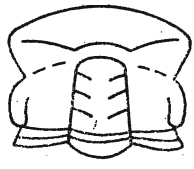

Fig. 10
Strenuaeva trifida sp. n.

Fixigenae are strongly inflated, palpebral lobes are long (*exsag.*). Preglabellar field long (*sag.*), inflated; preglabellar furrow distinct, divided into three parts, long (*sag.*), and in the front of glabella curved anteriorly. Anterior branch of facial suture longer than the posterior one, divergent anteriorly.

DISCUSSION: The new species differs from *Strenuaeva primaeva* (BRÖGGER, 1879) in longer preglabellar field, different shape of preglabellar furrow, in broader glabella and moch shorter (*sag.*) occipital ring.

The new species differs from *Strenuaeva orlowinensis* SAMSONOWICZ, 1959, in broader cranidium, shorter glabella and occipital ring, different shape of preglabellar field and of anterior margin.

Genus *Strenuella* MATTHEW, 1887
Strenuella polonica SAMSONOWICZ, 1959
(Text-fig. 11 and Pl. 4, Figs 1—6; Pl. 7, Fig. 9)

1959. *Strenuella polonica* CZARNOCKI; J. SAMSONOWICZ, pp. 525—526, Pl. 1, Figs 1—12.

MATERIAL: More than 100 specimens preserved primarily as cranidia, cephala, parts of thorax, pleurae and librigenae; some specimens are complete or almost complete, several of which are enrolled.

DESCRIPTION: Exoskeleton elongate, narrowing posteriorly, with axial furrows well marked, deep. Cephalon rounded anteriorly, broader than long, convex, with deep axial furrows. Glabella strongly convex, slightly narrowing anteriorly, rounded in front, reaching about 3/4 of cranidium

length. Three pairs of lateral glabellar furrows. Occipital ring with a medium-sized, sharp spine; occipital furrow well marked, deeper on sides. Preglabellar area with long (*sag.*) cephalic border convex. Cephalic border furrow distinct, deep. Fixigenae slightly inflated, narrower than glabella, separated from glabella by axial furrows. Palpebral lobes short (*exsag.*) separated from fixigenae by a broad and shallow palpebral furrow; eye ridges distinct, directed to the anterior part of the glabella, reaching axial furrows. Posterior margin of cephalon with a small facet; posterior margin furrow distinct. Anterior branch of facial suture parallel, convergent near the anterior border. Librigenae narrow with broad border prolongated into a genal spine (*see* Text-fig. 11). Hypostoma

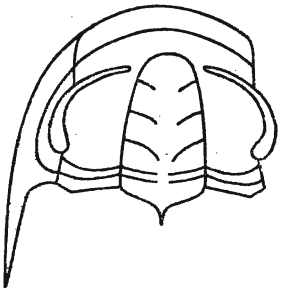

Fig. 11

Strenuella polonica SAMSONOWICZ, 1959

convex, elongated, narrowing posteriorly. Thorax consists of 13 segments. Axial part strongly convex with sharp spines; spines are longer on posterior axial rings and are directed backwardly. Pleurae with furrows, with short, sharp spines directed also backwardly. Pygidium small, triangular, with its axial part convex.

REMARKS: SAMSONOWICZ (1959c) described detaily the history of the species. New specimens are still collectable and thus some details of morphology become better documented.

HORIZON and LOCALITY: The species is very common in the Lower Cambrian, always in the Holmia Zone; the most commonly it appears in the exposures near Ociesęki.

Strenuella sandomirensis (SAMSONOWICZ, 1962)
(Text-fig. 12 and Pl. 4, Figs 9—11)

1962. *Termierella sandomirensis* sp. n.; SAMSONOWICZ, pp. 10—11, Pl. 1, Figs 1—6.

MATERIAL: 8 cranidia.

DESCRIPTION: Cranidium strongly convex, rounded anteriorly, with distinct axial furrows. Glabella convex, conical, rounded anteriorly, reaching about 3/4 of cranidium length. Three pairs of lateral glabellar furrows. Occipital ring with short but massive spine; occipital furrow distinct. Preglabellar field short (*sag.*), slightly inflated with narrow, convex anterior border. Fixigenae inflated, separated from glabella by broad and deep axial furrows. Palpebral lobes long and broad, reaching the posterior margin furrow; eye ridges long, directed to the anterior part of glabella and

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PLATE 3 (*cnt'd*)

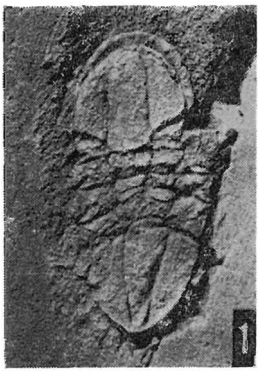
Schmidtiellus panowi (SAMSONOWICZ, 1959)

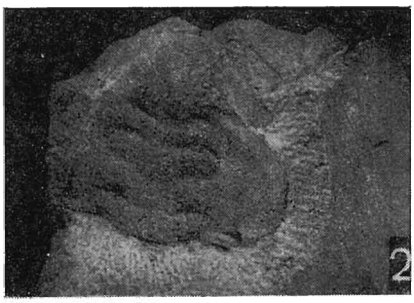
4 — Cephalon with part of thorax (No. 1.342), nat. size; Ociesęki

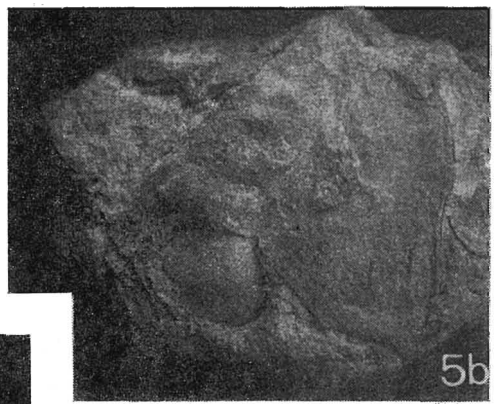
Postfallotaspis spinatus gen. et sp. n.

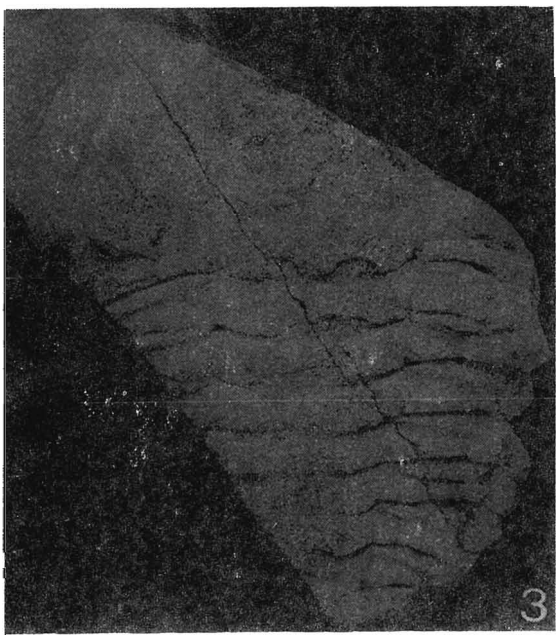
5a-5d — Part of large cephalon (No. 1.496 — holotype): *5a-5b* upper view, *5c* posterior view, *5d* lateral view, nat. size; Igrzyczna Hill

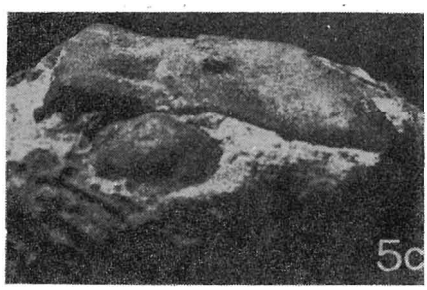
Photos taken by S. ULATOWSKI











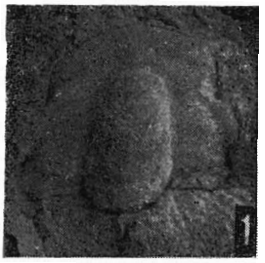
Serrodiscus primarius sp. n.

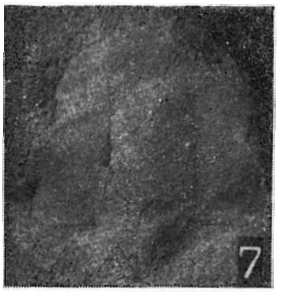
1 — Complete specimen (No. Kc 23/1 — holotype), × 3; Kamieniec

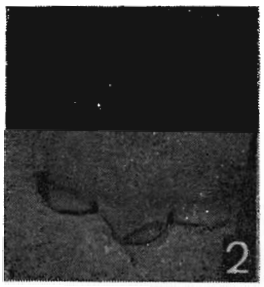
Schmidtiellus nodosus sp. n.

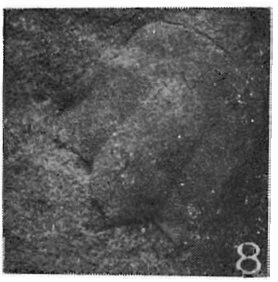
2 — Partly preserved cephalon (No. 1.350), nat. size; Ociesęki

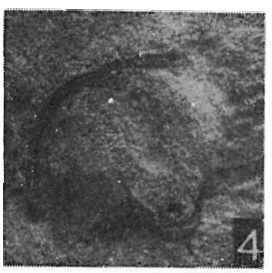
3 — Partly preserved large individual (No. 1.352), nat. size; Sterczyna Hill

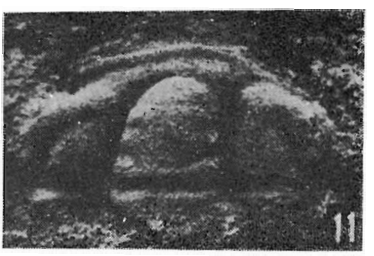


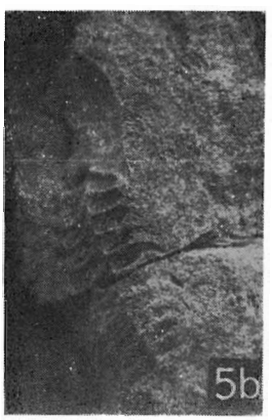


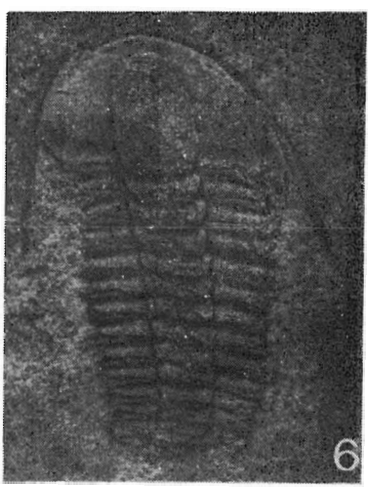












Strenuella polonica SAMSONOWICZ, 1959

1-3 — Cranidia (Nos 1.432, 1.66, 1.403), × 2; Ociesęki

4 — Cephalon (No. 1.431), × 2; Ociesęki

5a-5b — Cranidium with part of thorax (No. 1.388): *5a* top view, *5b* lateral view, × 2; Ociesęki

6 — Cephalon with thorax (No. 1.391), × 2; Ociesęki

reaching axial furrows; palpebral lobes not bilobated. Anterior branch of facial suture short, strongly divergent (*see* Text-fig. 12).

Fig. 12

Strenuella sandomirensis (SAMSONOWICZ, 1962)

REMARKS: SAMSONOWICZ (1962) when established this species attributed it to the genus *Termierella*. There is however, a lack of features typical of this genus, such as bilobated palpebral lobes reaching the front of glabella and the occipital spine. The above indicated features, *viz.* the presence of single palpebral lobes, and of the occipital spine evidence its belonging to the genus *Strenuella*.

The species *Strenuella sandomirensis* (SAMSONOWICZ, 1962), differs from *Strenuella polonica* SAMSONOWICZ, 1959, in longer glabella, shorter preglabellar field, less distinct anterior border, more inflated fixigenae, and in a different shape of the occipital spine.

HORIZON and LOCALITY: Holmia Zone, hills around the village Gieraszowice near Klimontów.

Strenuella zbelutkae sp. n.
(Text-fig. 13 and Pl. 4, Figs 7—8)

1959. *Strenuella* cf. *laket* HUPÉ; J. SAMSONOWICZ, pp. 526—527, Pl. 2, Figs 1—3.

HOLOTYPE: Cranidium (specimen No. 1.436), presented in Pl. 4, Fig. 7.
TYPE LOCALITY: Outcrops near the village Zbełutka, south of Łagów.
TYPE HORIZON: Lower Cambrian, Holmia Zone.
DERIVATION OF THE NAME: After the name of village Zbelutka.
MATERIAL: 12 cranidia.

DIAGNOSIS: A *Strenuella* with flat cranidium and a massive but short occipital spine.

DESCRIPTION: Cranidium weakly convex, rounded anteriorly. Glabella elongated, slightly narrowing anteriorly, rounded. Three pairs of lateral glabellar furrows weakly marked. Occipital ring tringular with a short and massive occipital spine; occipital furrow shallow. Preglabellar field

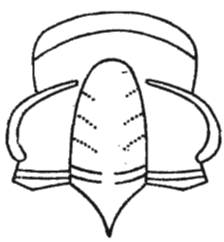


Fig. 13

Strenuella zbelutkae sp. n.

flat; anterior border long (*sag.*) but weakly marked. Fixigenae flat, palpebral lobe short (*exsag.*) and narrow; eye ridge weakly impressed but distinct, reaching almost the frontal part of glabella (*see* Text-fig. 13). Librigenae with genal spines. Anterior branch of facial suture directed anteriorly.

PLATE 4 (*cnt'd*)

Strenuella zbelutkae sp. n.

7-8 — Cranidia (Nos 1.436 — holotype, Zb 3), × 2; Zbelutka

Strenuella sandomirensis (SAMSONOWICZ, 1962)

9-11 — Cranidia (Nos Gr 2, Cr 5, Gr 4), × 3; Gieraszowice

Photos taken by S. ULATOWSKI

DISCUSSION: The new species differs from *Strenuella polonica* SAMSONOWICZ, 1959, in less convex cranidium, less convex glabella, in weakly marked lateral glabellar furrows, in shape of occipital ring and spine, in having a flat preglabellar field.

The new species is similar in its outline to *Strenuella strenua* (BILLINGS), but it differs in a more flat cephalon, shorter glabella, and in different shape of the occipital ring and spine.

The new species differs from *Strenuella sandomirensis* (SAMSONOWICZ, 1962) in a more elongated cranidium, narrower glabella, shape of occipital ring and spine, and in having the cranidium more flat.

From *Strenuella lakei* HUPÉ, 1952, the new species differs in the shape of occipital spine, and in having a more distinct anterior border.

Genus *Comluella* HUPÉ, 1953

Comluella oratrix sp. n.

(Text-fig. 14 and Pl. 5, Figs 1—7; Pl. 7, Fig. 9)

1959. *Strenuaeva primaeva* (BRÖGGER); J. Samsonowicz, pp. 521—522, Pl. 1, Figs 1—8.
1962. *Strenuaeva primaeva* (BRÖGGER); J. SAMSONOWICZ, p. 11, Pl. 2, Figs 2—4, 6—7.

HOLOTYPE: Almost complete exoskeleton (specimen No. 1.607), presented in Pl. 5, Fig. 4.
TYPE LOCALITY: Igrzyczna Hill at Ciesęki.
TYPE HORIZON: Lower Cambrian, Holmia Zone, Ciesęki Sandstone Formation.
DERIVATION OF THE NAME: Latin *oratrix* — because of similarity to another species attributed to another genus as referenced in the synonymy.
MATERIAL: Four almost complete specimens, and over 60 cranidia.

DIAGNOSIS: A *Comluella* with moderaterly convex cephalon, long and broad glabella, librigenae with genal spine, thorax with 11 segments.

DESCRIPTION: Cephalon moderaterly convex, semioval; librigenae with long, sharp spines; axial furrows shallow but broad. Glabella convex, tapering enteriorly; front of glabella rounded to triangular; three pairs of lateral glabellar furrows are present. Glabella broader than fixigenae and reaches about 4/5 of cranidium length. Occipital ring short, rounded posteriorly; occipital furrow distinct. Fixigenae slightly inflated, separated from glabella by broad (*tr.*) but shallow axial furrows. Palpebral lobe long (*exsag.*), reaching the posterior border furrow; eye ridges weakly marked. Preglabellar field short (*sag.*), moderaterly inflated, separated from the glabella and fixigenae by a long (*sag.*) and shallow furrow (*see* Text-fig. 14). Librigenae narrow with a long, sharp but narrow

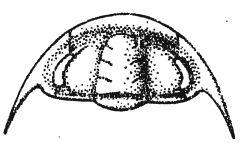


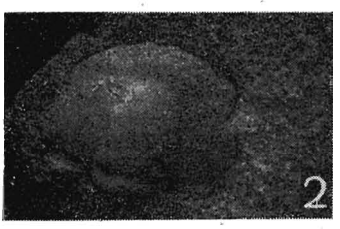
Fig. 14
Comluella oratrix sp. n.

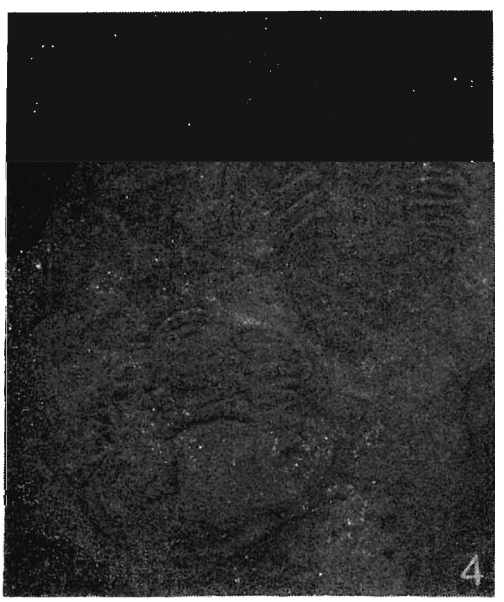
genal spine. Thorax with 11 segments, narrowing posteriorly. Axial part convex without spines or nodes. Pleurae with distinct elongated pleural furrows; pleural spines very sharp, directed backwardly. Pygidium triangular, small; axial part convex almost reaching the posterior margin.

DISCUSSION: The species is very common in the Lower Cambrian rocks of the area, but the most frequent are cranidia. Formerly, SAMSONOWICZ (1959b) attributed all the collected specimens to *Strenuaeva primaeva* (BRÖGGER), primarily after an inflated preglabellar field of cranidia. Such features as: short preglabellar field, and long and broad glabella point an assignation of the newly established species to the genus *Comluella*.

From *Comluella samsonowiczi* (ORŁOWSKI, 1964) the new species differs by longer glabella, inflated preglabellar field, and less inflated fixigenae.

From *Comluella hupei* (ORŁOWSKI, 1964) the new species differs in having a narrower glabella and an inflated preglabellar field.





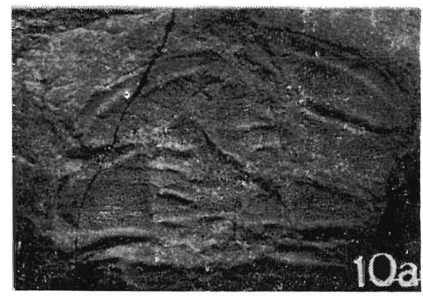
Comluella oratrix sp. n.

1-3 — Cranidia (Nos 1.627, 1.630, 1.621), ×2; Ociesęki
4 — Two specimens (No. 1.607; holotype is arrowed), and another one partly enrolled, ×2 ; Igrzyczna Hill
5 — Three cranidia (No. 1.644), ×2; Ociesęki
6 — Three cranidia associated with one cranidium (*arrowed*) of *Strenuella polonica* (No. 1.610). ×2; Ociesęki
7 — Three cranidia (No. 1.626), ×2; Ociesęki.

Photos taken by S. ULATOWSKI


1


7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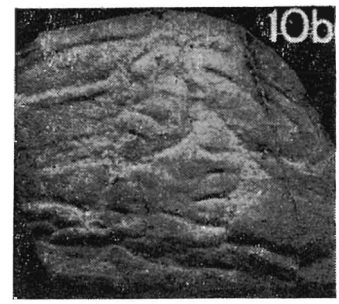
2


8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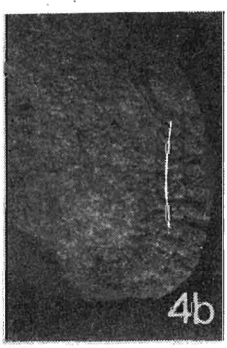
3


11


4a


9


6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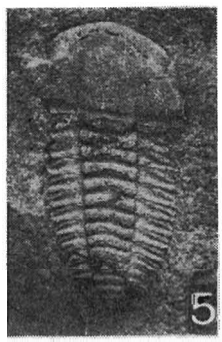
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Comluella igrzycznae sp. n.
(Text-fig. 15 and Pl. 6, Figs 1—6)

1959. *Strenuaeva primaeva* (BRÖGGER); J. SAMSONOWICZ, pp. 521—522, Pl. 1, Fig. 9.
1962. *Strenuaeva primaeva* (BRÖGGER); J. SAMSONOWICZ, p. 11, Pl. 2, Fig. 1; Pl. 3, Figs 3, 5.

HOLOTYPE: Complete exoskeleton, partly enrolled (specimen No. 1.301), presented in Pl. 6, Fig. 4.
TYPE LOCALITY: Igrzyczna Hill at Ociesęki.
TYPE HORIZON: Lower Cambrian, Holmia Zone, Ociesęki Sandstone Formation.
DERIVATION OF THE NAME: After the name of Igrzyczna Hill.
MATERIAL: Four specimens complete or almost complete (two of them enrolled) and over 40 cranidia.

DIAGNOSIS: Carapace elongated, axial furrows distinct, cephalon evenly convex, rounded anteriorly; glabella narrow with long occipital ring, displaying three pairs of lateral glabellar furrows; librigenae narrow without genal spine.

DESCRIPTION: Cephalon rounded auteriorly, glabella convex, narrow, tapering forward, rounded anteriorly, with three pairs of faintly marked lateral glabellar furrows, reaching 3/4 of cephalon length. Occipital ring long (*sag.*), rounded posteriorly; occipital furrow distinct, composed. Fixigenae narrow, slightly convex to almost flat, separated from the glabella by distinct but shallow

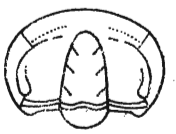

Fig. 15
Comluella igrzycznae sp. n.

axial furrows. Palpebral lobe weakly marked, eye ridges short or absent. Preglabellar field flat or slightly inflated, preglabellar furrow long (*sag.*) but shallow. Anterior branch of facial suture divergent. Librigenae narrow, rounded, without genal spine. Duplicature short (*sag.*) in frontal part, narrower laterally (*see* Text-fig. 15). Thorax consists of 13 segments, narrowing slightly posteriorly; axial part convex without any node or spine; axial furrows distinct. Pleurae with pleural

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PLATE 6

Comluella igrzycznae sp. n.

1-3 — Cranidia (Nos 1.334, 1.315, 1.320), × 2; Ociesęki
4a-4b — Complete specimen (No. 1.301 — holotype): *a* top view, *b* lateral view, × 2; Igrzyczna Hill
5 — Almost complete specimen without librigenae (No. 1.300), × 2; Igrzyczna Hill
6 — Two cranidia (No. 1.317), × 2; Ociesęki

Strenuaeva orlowinensis SAMSONOWICZ, 1959

7 — Cranidium (No. Wi 3), × 3; Zamczysko Hill

Strenueva trifida sp. n.

8 — Cranidium (No. 1.538 — holotype), × 2; Wola Jastrzębska
9 — Cranidium (No. Cd 1), × 3; Chojnów Dół

Protolenus (Latoucheia) glabellosus sp. n.

10a-10b — Cranidium and first thoracic segment (No. Kc 24/2 — holotype): *10a* outer cast, *10b* latex cast, × 2; Kamieniec

Protolenus (Protolenus) expectans sp. n.

11 — Cranidium (No. 1.543 — holotype), × 2; Wola Jastrzębska

Photos taken by S. ULATOWSKI

furrows; outer part bent down, terminated with small but sharp pleural spines except of first and second segments which are terminated with short and blunt spines. Pygidium small, triangular; axial part convex.

DISCUSSION: The new species differs from *Comluella oratrix* sp. n. by having a narrower glabella, long occipital ring, more flat preglabellar field, librigenae without genal spines, and two first thoracic segments with shorter spines.

The new species differs from *Comluella samsonowiczi* (ORŁOWSKI, 1964) in a more elongated cranidium, narrower and more tapering glabella, longer occipital ring, flat fixigenae.

The new species differs from *Compluella hupei* (ORŁOWSKI, 1964) in narrower and more tapering glabella and broader fixigenae.

Genus *Micmacca* MATTHEW, 1895

Micmacca (Acanthomicmacca) klimontowi sp. n.

(Text-fig. 16 and Pl. 7, Figs 5—8)

1962. *Strenuella* cf. *lakei* HUPÉ; J. SAMSONOWICZ, p. 12, Pl. 3, Figs 7—8.

HOLOTYPE: Cranidium (specimen No. *D6*), presented in Pl. 7, Fig. 5.
TYPE LOCALITY: Exposure Dąb near Klimontów.
TYPE HORIZON: Lower Cambrian, Holmia Zone.
DERIVATION OF THE NAME: After the name of village Klimontów.

MATERIAL: 10 cranidia.

DIAGNOSIS: A *Micmacca* with broad almost parallel-sided glabella provided with an occipital spine.

DESCRIPTION: Cranidium rounded anteriorly with weakly impressed axial furrows and with glabella strongly convex. Glabella parallel-sided or almost parallel-sided in younger specimens, convex, rounded anteriorly, reaching almost 3/4 of cranidium length, without lateral glabellar furrows. Occipital ring with a massive, sharp spine; the shape of spine changes in younger and

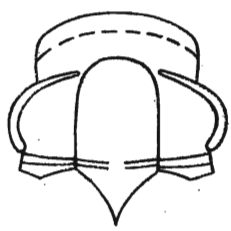

Fig. 16
Micmacca (Acanthomicmacca) klimontowi sp. n.

adult individuals. Occipital furrow shallow. Preglabellar field flat, anterior border long (*sag.*), weakly convex. Fixigenae flat, narrower than glabella, palpebral lobes narrow; eye ridges distinct,

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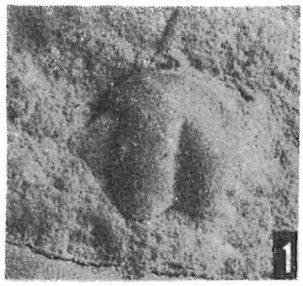
PLATE 7 (*cnt'd*)

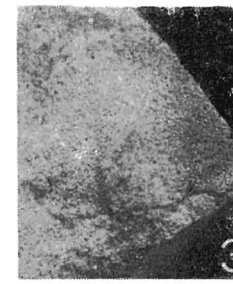
4a-4b — *Ellipsocephalus sanctacrucensis* (SAMSONOWICZ, 1959): complete specimen (No. 1.552) *4a* top view, *4b* lateral view, nat. size; Zamczysko Hill

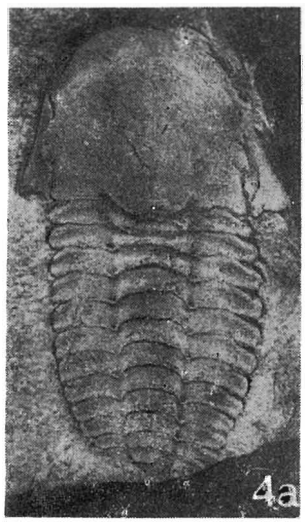
5-8 — *Micmacca (Acanthomicmacca) klimontowi* sp. n.: cranidia (Nos D6 — holotype, D5, D7, D8), × 2; Dąb

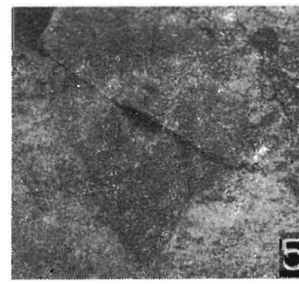
9 — Mass occurrence of *Comluella oratrix* sp. n. and *Strenuella polonica* SAMSONOWICZ, 1959, and fragments of other trilobites (No. 1.608), nat. size; Ociesęki

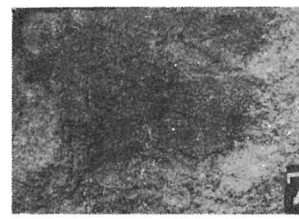
Photos taken by S. ULATOWSKI

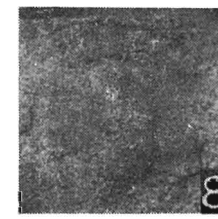


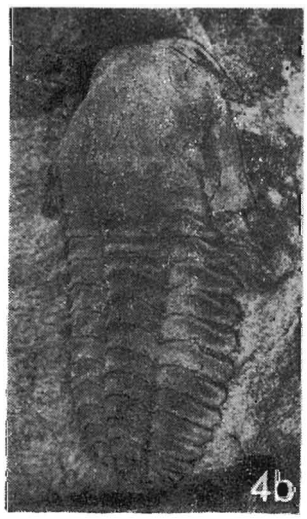


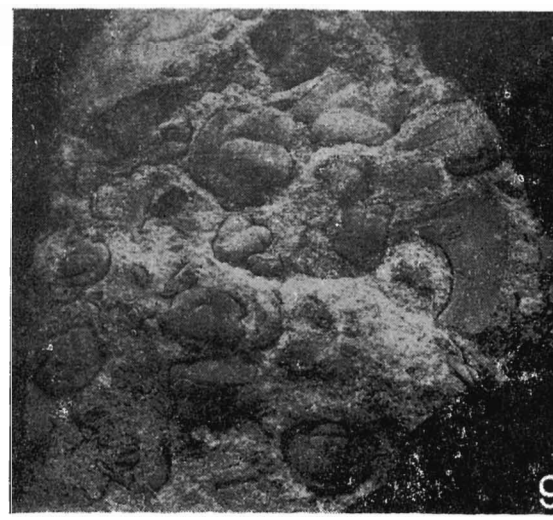












1 — *Elatius integer* gen. et sp. n.: cranidium (No. Cd 3 — holotype), × 3; Chojnów Dół
2 — *Ellipsocephalus kiaeri* (SAMSONOWICZ, 1959): cranidium (No. 1/II/18), × 2; Chojny ravine
3 — *Ellipsocephalus simplex* sp. n.: cranidium (No. 1.443 — holotype), × 2; Dąb

directed to the anterior part of glabella. Anterior branch of facial suture longer than posterior directed anteriorly (*see* Text-fig. 16).

DISCUSSION: The subgenus *Acanthomicomacca* was separated by HUPÉ (1952) and it is, characterized by a relatively slender glabella any by the presence of the occipital spine.

The new species differs from *Micmacca (Acanthomicmacca) walcotti* MATTHEW, 1899, by a shorter glabella, longer preglabellar field, a lack of lateral glabellar furrows, and a different shape of occipital spine.

Family **Protolenidae** RICHTER & RICHTER, 1948
Genus *Protolenus* MATTHEW, 1892
Protolenus (Protolenus) expectans sp. n.
(Text-fig. 17 and Pl. 6, Fig. 11)

HOLOTYPE: Cranidium (specimen No. 1.543), presented in Pl. 6, Fig. 11.
TYPE LOCALITY: Unnamed hill south of village Wola Jastrzębska, near Łagów.
TYPE HORIZON: Lower Cambrian, Protolenus Zone.
DERIVATION OF THE NAME: Latin *expectans* — after its occurrence in stratigraphic position proper for the protolenids.
MATERIAL: 9 cranidia.

DIAGNOSIS: A *Protolenus* with an elongated glabella, long occipital ring, and long palpebra, lobes.

DESCRIPTION: Cranidium almost as long as broad, convex, anterior margin rounded. Glabella long, broad, slightly narrowing anteriorly; frontal part much narrower, rounded anteriorly. Occipital ring long, rounded posteriorly; occipital furrow distinct, composed. Three pairs of lateral glabellar furrows directed backwardly are present. Preglabellar field flat, anterior border short (*sag.*),

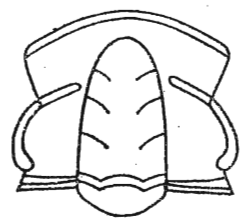


Fig. 17
Protolenus (Protolenus) expectans sp. n.

weakly convex; anterior border furrow weakly marked. Fixigenae lowering outside, palpebral lobes long (*exsag.*); eye ridges prominent, directed to the anterior part of glabella. Anterior branch of facial suture longer than the posterior one, slightly divergent (*see* Text-fig. 17).

DISCUSSION: The new species differs from *Protolenus paradoxoides* MATTHEW, 1892, by a more triangular anterior part of glabella, the shape of occipital furrow, and by a longer preglabellar field.

The new species differs from *Protolenus (Protolenus) czarnockii* ORŁOWSKI & BEDNARCZYK, 1965, by a narrower cranidium and by a much broader and more tapering glabella.

The new species differs from *Protolenus (Protolenus) polonicus* ORŁOWSKI, 1964, by a narrower crandium, longer glabella, longer occipital ring, composed occipital furrow.

Protolenus (Latoucheia) glabellosus sp. n.
(Text-fig. 18 and Pl. 6, Fig. 10)

1962. *Conocoryphe*? sp.; J. SAMSONOWICZ, p. 12, Pl. 3, Fig. 10—10a.

HOLOTYPE: Cranidium (specimen No. *Kc* 24/2), presented in Pl. 6, Fig. 10.

TYPE LOCALITY: Exposure Kamieniec near Klimontów.
TYPE HORIZON: Lower Cambrian, Protolenus Zone, Kamieniec Shale Formation.
DERIVATION OF THE NAME: After a very broad glabella.
MATERIAL: One cranidium with the first thoracic segments, and a part of another thorax.

DIAGNOSIS: A *Protolenus* with a very broad, parallel-sided glabella, the surface of which is tuberculate.

DESCRIPTION: Cranidium broader than long, rounded anteriorly; posterior margin directed slightly backward. Glabella parallel-sided, rounded anteriorly, broad, weakly convex. Three pairs of lateral glabellar furrows distinct, directed backwardly are present. Occipital ring short, occipital furrow composed. Frontal area with long (*sag.*) anterior border, anterior border furrow distinct. Fixigenae flat. Palpebral lobes long (*exsag.*), reaching the posterior border furrow; eye ridges prominent, reaching the anterior part of glabella (*see* Text-fig. 18). Cranidium except palpebral lobes covered by small, regular tuberclae. Thoracic segments short (*sag.*), their axial part as broad as pleural parts, axial furrows distinct, pleural furrows distinct, the surface is tuberculate.

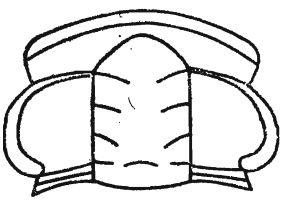


Fig. 18
Protolenus (Latoucheia) glabellosus sp. n.

DISCUSSION: The surface of cranidium and thorax is tuberculate and this feature suggests an attribution to the subgenus *Latoucheia* HUPÉ (1952). The new species differs from *Protolenus (Latoucheia) latouchei* COBBOLD, 1910, in having a much broader glabella, different shape of occipital ring and of frontal area.

The new species differs from *Protolenus (Latoucheia) morpheus* COBBOLD, 1910, in having a much broader cranidium, much broader and longer glabella, and a different shape of fronta area.

Family **Eodiscidae** RAYMOND, 1913

Genus *Serrodiscus* RICHTER & RICHTER, 1941

Serrodiscus primarius sp. n.

(Pl. 3, Fig. 1)

1962. *Serrodiscus speciosus* (FORD); J. SAMSONOWICZ, p. 13, Pl. 4, Fig. 6.

HOLOTYPE: The whole exoskeleton (specimen No. *Kc* 23/1), presented in Pl. 3, Fig. 1.
TYPE LOCALITY: Exposure Kamieniec near Klimontów.
TYPE HORIZON: Lower Cambrian, Protolenus Zone, Kamieniec Shale Formation.
DERIVATION OF THE NAME: Latin *primarius* — after its primeval occurrence in the area.
MATERIAL: One whole specimen, four cephala, five pygidia.
MEASUREMENTS: Length of whole specimen 13 mm, width of thorax 5 mm.

DIAGNOSIS: A *Serrodiscus* with long, broad, parallel-sided glabella, bearing many nodes on border, and with the axial part of pygidium smooth.

DESCRIPTION: Cephalon parabolic in outline, almost as long as broad. Glabella convex, parallel-sided and long, reaching the anterior border, rounded anteriorly, without lateral glabellar furrows; occipital ring not differenciated. Axial furrows distinct. Genae as broad as glabella, narrowing anteriorly, separated from the glabella. Border long (*sag.*) anteriorly, narrowing laterally, with regular nodes. Thorax composed of three segments. Pygidium rounded more sharply than cephalon. Axial part narrowing posteriorly, reaching the posterior margin, and smooth; axial furrows are distinct. Lateral parts narrowing posteriorly. Border narrow, weakly discernible.

DISCUSSION: The new species differs from *Serrodiscus speciosus* (FORD), by a longer and parallel-sided glabella, nodes on the border in front of glabella, and by smooth axial part of pygidum.

The new species differs from *Serrodiscus ctena* RUSHTON, 1966, in having a longer cephalon and broader genae.

The new species differs from *Serrodiscus serratus* R. & E. RICHTER, 1941, in having a longer and broader glabella and smooth axial part of pygidium.

The new species differs from *Serrodiscus silesius* R. & E. RICHTER, 1941, in having a smooth axial part of pygidium.

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S. ORŁOWSKI

TRYLOBITY KAMBRU DOLNEGO GÓR ŚWIĘTOKRZYSKICH

(Streszczenie)

Przedmiotem pracy jest rewizja trylobitów pochodzących z utworów kambru dolnego Gór Świętokrzyskich (*patrz* fig. 1—18 oraz pl. 1—7), a opisanych częściowo już wcześniej przez SAMSONOWICZA (1959a, b, c; 1962) oraz przez autora (ORŁOWSKI 1974, 1975a). Trylobity z rodziny Olenellidae reprezentowane są przez sześć gatunków należących do rodzajów: *Holmia*, *Schmidtiellus*, *Kjerulfia*; opisano też nowy rodzaj i gatunek *Postfallotaspis spinatus* gen. et sp. n., oraz nowy gatunek *Schmidtiellus nodosus* sp. n. Z innych rodzin opisano następujące gatunki jako nowe: *Strenuella zbelutkae* sp. n., *Comluella oratrix* sp. n., *Comluella igrzycznae* sp. n., *Ellipsocephalus simplex* sp. n., *Micmacca (Acanthomicmacca) klimontowi* sp. n., *Strenuaeva trifida* sp. n., *Protolenus (Protolenus) expectans* sp. n., *Protolenus (Latoucheia) glabellosus* sp. n., *Serrodiscus primarius* sp. n., oraz nowy rodzaj i gatunek *Elatius integer* gen. et sp. n. Wśród fauny towarzyszącej trylobitom zwrócono uwagę na występowanie przedstawiciela staroraków (Merostomata), reprezentowanych przez gatunek *Paleomerus makowskii* ORŁOWSKI, 1983.