

HALSZKA OSMÓLSKA

TWO NEW TRILOBITES FROM THE TRESKELODDEN BEDS OF
HORNSUND (VESTSPITSBERGEN)

Abstract.—Two new trilobites: *Ditomopyge roemeri spitsbergensis* n. subsp. and *Paladin trigonopyge* n. sp. are described. *D. roemeri spitsbergensis* seems to indicate the Upper Carboniferous age for these beds, as its close relatives *D. roemeri roemeri* (v. Moeller, 1867) and *D. grünewaldti* (v. Moeller, 1867) are known from the Gzhelian Stage of the Urals, Donetz Basin and Voronezh Region (USSR).

INTRODUCTION

The material here described comes from the Treskelodden Beds and was collected during the Polish Spitsbergen Expedition of 1960 by Dr. St. Czarniecki (Geological Laboratory, Cracow, Institute of Geological Sciences of the Polish Academy of Sciences), who kindly put it at the present author's disposal. In the same beds, foraminifers (Liszka, 1964), bryozoans (Czarniecki, 1964), brachiopods (Birkenmajer & Czarniecki, 1960; Czarniecki, manuscript) and corals (Fedorowski, 1964, 1965) were already reported.

The age of these beds is under the discussion. According to Fedorowski (1964, 1965), Liszka (1964), Birkenmajer (1964), it should be determined as the Lower Permian, while in Czarniecki's opinion (1966) it is Upper Carboniferous.

The two trilobites here described are assigned to the two genera: *Ditomopyge* Newell, 1931 and *Paladin* Weller, 1935; the former known both from the Carboniferous and the Permian, while the latter was so far reported only from the Carboniferous. Unfortunately, their stratigraphic importance is not great, as both forms are new. *D. roemeri spitsbergensis* n. subsp. is, however, very close to *D. roemeri roemeri* (v. Moeller, 1867) and *D. grünewaldti* (v. Moeller, 1867) from the Upper Carboniferous (Gzhelian) of USSR (the Urals, Donetz Basin, Voronezh Region), as well as to *D. scitula* (Meek & Worthen, 1865) from the Pennsylvanian of North America. *Paladin trigonopyge* n. sp., the second

form here described, also finds its close relative in the Upper Carboniferous species *Paladin jurezanensis* (Weber, 1937) from the Urals.

In conclusion, in the present author's opinion, the Upper Carboniferous age of the Treskelodden Beds is the more probable.

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The present author wishes to express her gratitude to Dr. St. Czarniecki for loaning the material and for his most valuable discussions.

The photographs are made by Miss M. Czarnocka (Palaeozool. Institute, Polish Acad. Sci., Warsaw) and the present author. The collection is housed in the Geological Laboratory, Cracow, Institute of Geological Sciences of the Polish Academy of Sciences (ZNG Kr.). Abbreviation TML is used for the specimens housed in the Tchernyshev's Museum in Leningrad, USSR.

DESCRIPTIONS

Family **Phillipsiidae** Oehlert, 1886

Genus *Ditomopyge* Newell, 1931, emend. Weller, 1935

Ditomopyge roemeri (v. Moeller, 1867)

Subspecies assigned: D. roemeri roemeri (v. Moeller, 1867) and *D. roemeri spitsbergensis* n. subsp.

Stratigraphic and geographic range.—Upper Carboniferous (Gzhelian) of USSR (the Urals, Donetz Basin, Voronezh Region) and ?Upper Carboniferous of Vestspitsbergen.

Remarks.—In 1867, von Moeller described several Upper Carboniferous trilobites from the Urals, between others „*Phillipsia roemeri*” and „*Phillipsia grünewaltdti*”. Later, Weber (1933, 1937) assigned these two species to the genus *Griffithides* Portlock, 1843. However, both mentioned forms expose characters typical for the genus *Ditomopyge* Newell, 1931 and are close to *Ditomopyge scitula* (Meek & Worthen, 1865). These characters can be listed as follows: 1) anterior border vertically placed, coalesced with glabella; 2) basal lobes drop-like, cut off; 3) preoccipital lobe developed; 4) pygidium strongly vaulted transversely, short and broad; 5) sharply separated, convex rings and ribs.

Consequently, the present author considers „*Phillipsia roemeri*” and „*Ph. grünewaltdti*” as the representatives of *Ditomopyge* Newell.

Ditomopyge roemeri spitsbergensis n. subsp.

(Pl. I, Figs. 1–3, 7; Text-pl. I, Figs. 6–8)

Holotype: Pygidium, internal mould (ZNG Kr. 1213/560); Pl. I, Fig. 7.

Type horizon: Treskelodden Beds, ?Upper Carboniferous.

Type locality: Creek IV, Treskelodden, Hornsund, Vestspitsbergen.

Derivation of the name: *spitsbergensis*—found on Spitsbergen.

Diagnosis.—Pygidium surrounded by convex border, ornamented by anastomosing lines; axis high and narrow, with 13 convex rings, 8 very prominent ribs; glabella comparatively slender, with pronounced preoccipital lobe; librigena with weakly pronounced subocular groove.

Material.—One damaged cranidium, 1 librigena, about 30 pygidia (preserved mainly as internal moulds) from dark grey limestone of type horizon and locality.

Dimensions (in mm):

	ZNG Kr. Nos.			
	1221/560	1239a/560	1239/560	1213/560
Length of cranidium	11.0	—	—	—
Length of glabella	8.8	—	—	—
Width of glabella	6.2	—	—	—
Length of pygidium	—	2.8	7.8	10.5
Width of pygidium	—	2.5	9.8	12.2
Length of axis	—	2.2	6.8	9.0
Width of axis	—	1.4	2.2	4.2

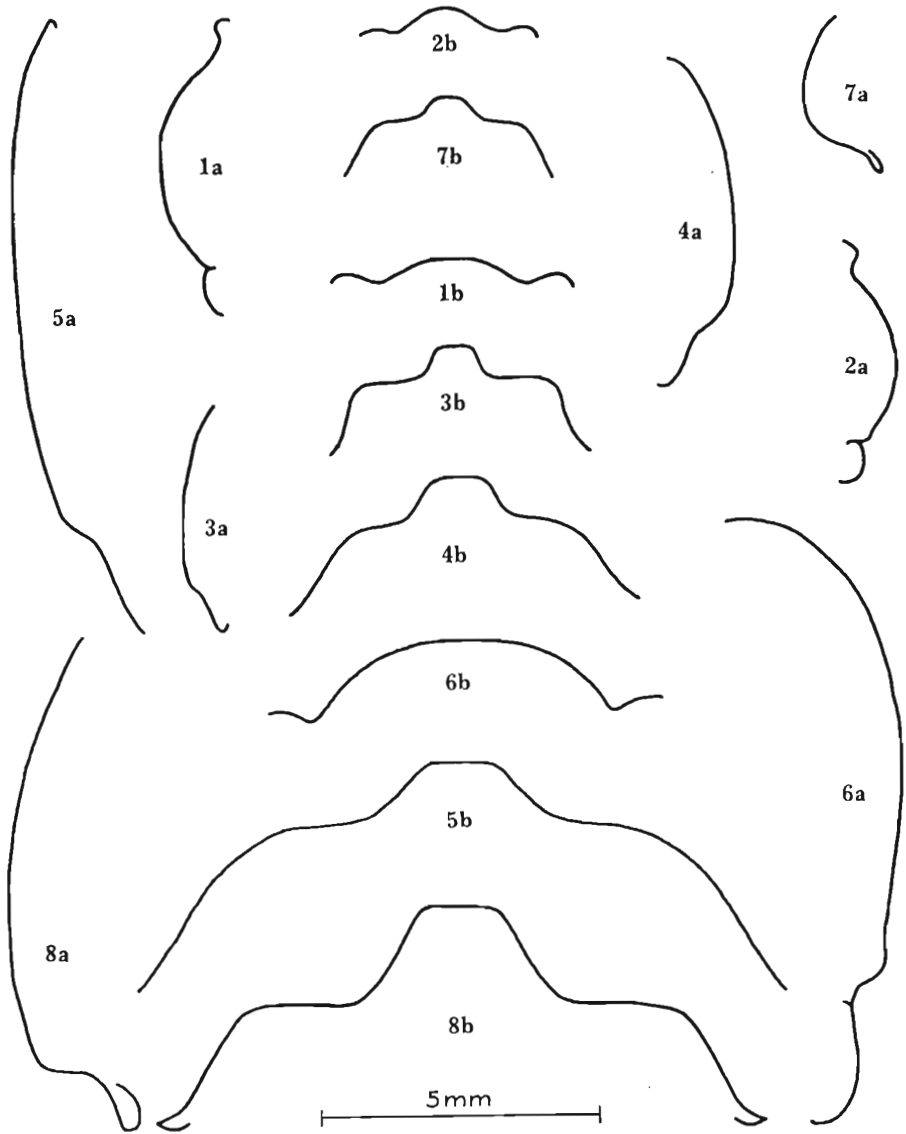
Description.—Cranidium (internal mould) broadly rounded at front, anterior border broad, vertically placed, coalesced with glabella; glabella broadest across the front, where it is flatly rounded; basal lobe small, weakly convex, basal furrow reaching occipital furrow; preoccipital medial lobe marked, but preoccipital furrow indistinctly pronounced; fixigena extremely narrow, palpebral lobe short (*exsag.*), well curved, anterior and posterior branches of facial suture parallel to axial furrow; librigena with thick genal spine, equal in length to length of eye; lateral border vertical, very well delimited; eye large, with steep visual lobe, subocular groove faintly developed.

In longitudinal section, occipital ring moderately convex, median preoccipital lobe faintly differentiated, glabella gently sloping forwards, coalesced with vertical anterior border.

In transverse section, glabella flat, palpebral lobe somewhat raised, lower than glabella.

Hypostoma and thorax unknown.

Pygidium short, somewhat narrowing backwards, surrounded by broad, very convex border, which is situated nearly perpendicularly to slopes of pleural lobes; axis as broad as a pleural lobe, or somewhat narrower, with 13 well separated, convex rings; 8 very convex ribs, each with swelling at the point, where it bends downwards; anterior bands of ribs very broad (*exsag.*) and, excluding the first one, occupying the



Paladin trigonopyge n. sp.

- Fig. 1. Cranidium (ZNG Kr. 1220b/560).
 Fig. 2. Cranidium (ZNG Kr. 1220a/560).
 Fig. 3. Young pygidium (ZNG Kr. 1231/560).
 Fig. 4. Pygidium (ZNG Kr. 1220c/560).
 Fig. 5. Pygidium (ZNG Kr. 1235/560).

Ditomopyge roemeri spitsbergensis n. subsp.

- Fig. 6. Cranidium, internal mould (ZNG Kr. 1221).
 Fig. 7. Young pygidium (ZNG Kr. 1239a/560).
 Fig. 8. Holotype pygidium (ZNG Kr. 1213/560).

a longitudinal section, b transverse section
 Treskelodden Beds, Treskelodden, Hornsund, Vestspitsbergen

entire upper surface of a rib; pleural furrows very deep and broad; interpleural furrow visible on the first rib.

In longitudinal section, axis arched with vertically cut posterior end, axial rings very convex, inclined backwards, postaxial region sloping comparatively steeply.

In transverse section, axis highly elevated trapezoidal, pleural lobes very strongly vaulted, bent down at nearly a right angle, border convex, placed approximately horizontally.

Exoskeleton of librigena smooth, pygidium finely granulated, medial parts of rings each with a row of larger tubercles; border covered with thin, anastomosing lines.

Ontogenetic variations. — In the collection occur pygidia of different sizes. The smallest one (ZNG Kr. 1239a/560; Pl. I, Fig. 2) is similarly vaulted transversely as the large pygidia, but with only 10 visible rings and an axis sloping very steeply backwards, indistinctly delimited at the end. On pleural lobes, 7 ribs are similarly developed as in adult forms; the border surrounding the pygidium is flat, broad and horizontally placed. On the somewhat larger pygidium (ZNG Kr. 1239/560), the border is not marked at all, the pygidium being surrounded by a smooth band devoid of the prolongations of the ribs. This band is situated in the continuation of the pleural slopes.

Remarks. — The pygidia of *Ditomopyge roemeri spitsbergensis* n. subsp. resemble the pygidia of the nominate subspecies in having very prominent and sharply separated rings and ribs, the latter with characteristic swellings at the points where they bend down. The differences concern the pygidial border, which in *D. roemeri roemeri* (v. Moeller, 1867) is flat and generally in the prolongation of the pleural lobes, while in the new subspecies it is distinctly convex and situated nearly horizontally. The pygidial axis, in the subspecies here described, is also somewhat narrower than in the nominate subspecies.

A similar, convex pygidial border occurs in *Ditomopyge grünewaldti* (v. Moeller, 1867), which is closely related to *D. roemeri*. However, in the first species the ribs, though also convex, are not so sharply separated from each other, and the border is finely granulated, instead of having anastomosing lines, as in the subspecies here described. Moreover, the cranidium of *D. roemeri spitsbergensis* n. subsp. has a more slender glabella, which is also less vaulted than in *D. grünewaldti*, thus resembling the cranidium of *D. roemeri roemeri*.

In comparison with von Moeller's original cephalon of *D. roemeri roemeri*, the glabella of the new subspecies is more slender, its frontal lobe less convex transversely, and the subocular groove is very weakly developed, while this latter is deep and broad in the nominate subspecies.

Genus *Paladin* Weller, 1936*Paladin trigonopyge* n. sp.

(Pl. II, Figs. 1, 3-7; Text-pl. I, Figs. 1-5)

Holotype: Cranidium (ZNG Kr. 1220/560); Pl. II, Fig. 5.*Type horizon*: Treskelodden Beds, ?Upper Carboniferous.*Type locality*: Creek IV, Treskelodden, Hornsund, Vestspitsbergen.*Derivation of the name*: *trigonopyge*—because of triangular pygidium.

Diagnosis.—Species of *Paladin* with flat, short (*sag.*) preglabellar field and sloping downwards, vertically situated anterior border; median preoccipital lobe weakly developed; pygidium triangular, bluntly pointed posteriorly, axis slender, somewhat trapezoidal in cross-section, with 19-20 rings, 9 flat ribs; ornamentation faintly developed, granular.

Material.—Five cranidia, 1 hypostoma, about 40 pygidia from dark grey limestone from Treskelodden, a pygidium and a cranidium from grey-pink limestone of Hyrnefjellet, fragments of cranidium and pygidium from dark limestone of Kruseryggen, Hornsund, Vestspitsbergen.

Dimensions (in mm):

	ZNG Kr. Nos.				
	1220/560	1220a/560	1220b/560	1231/560	1235/560
Length of cranidium	5.8	4.0	8.2	—	—
Length of glabella . .	4.2	3.1	6.8	—	—
Width of glabella . .	2.9	2.3	4.1	—	—
Length of pygidium	—	—	—	4.3	11.0
Width of pygidium	—	—	—	5.0	12.5
Length of axis	—	—	—	3.9	9.5
Width of axis	—	—	—	1.6	4.0

Description.—Cranidium broadly rounded frontally, preglabellar region narrow, flat to somewhat concave, anterior border vertically placed, weakly convex; glabella gently convex, somewhat broader at front; 4 pairs of glabellar furrows, but only basal furrow distinct, cutting off the small drop-like basal lobe; occipital ring faintly narrowing and deeply sloping outwards; palpebral lobe subtriangular, broad (*tr.*), branches of facial sutures comparatively divergent.

In longitudinal section, occipital ring flat, somewhat lower than glabella, occipital furrow shallow, median preoccipital lobe extremely faintly pronounced, no preoccipital furrow, glabella gently sloping towards the short, horizontal preglabellar region, border weakly convex, sloping vertically and nearly perpendicular to preglabellar region.

In transverse section, glabella weakly convex, palpebral lobes rising outwards, at the half of their length (*tr.*) they bend downwards.

Hypostoma typical for *Paladin*, elongate, with moderately convex median body and weakly developed maculae.

Librigena unknown, though, judging from the high elevation of palpebral lobes and the lowly placed anterior and posterior parts of fixigena, it should be comparatively steeply situated, with a high and well developed visual lobe.

Thorax unknown.

Pygidium triangular, with bluntly pointed posterior end; border weakly convex, well delimited; axis very slender, with 19–20 rings, which are well separated from each other; pleural lobes very weakly vaulted; 9 comparatively flat ribs (with a place for two more); pleural furrows distinct, interpleural furrows not pronounced, the boundary between anterior and posterior band of rib in the form of a ridge, anterior band rising, posterior band sloping backwards.

In longitudinal section, axis gently inclined backwards, well delimited at the tip; postaxial region flat, somewhat sloping.

In transverse section, axis trapezoidal, narrow and comparatively high, pleural lobes weakly vaulted.

Pygidial doublure flat and horizontal in its most posterior part, otherwise bent inwards.

Ornamentation very weakly pronounced, in the form of fine pits and very low tubercles, the latter present only on glabella.

Ontogenetic variations.—A smallest cranidium found (ZNG Kr. 1220a/560; Pl. II, Fig. 1) differs from the larger ones in having transversely and longitudinally more convex glabella, and broad, concave border furrow which separates the glabella from anterior border, the latter being still situated partly on dorsal side and partly vertically. This border furrow later becomes evidently flat and forms a kind of preglabellar field, while the border migrates downwards to an entirely vertical position. Palpebral lobes are comparatively broader (*tr.*) than in larger forms.

The difference between the smallest pygidium found (ZNG Kr. 1231/560; Pl. II, Fig. 3) and the adult ones concerns mainly the transverse vaulting, which is stronger in the young pygidium. Also the ribs on this pygidium are more convex.

Remarks.—*Paladin trigonopyge* n. sp. is one of the latest known representatives of this genus. The most close to this species seems to be *Paladin jurezanensis* (Weber, 1937) from the Upper Carboniferous deposits of the Urals and the Voronezh region (= *Phillipsia*(?) *Griffithides*(?) *jurezanensis*; Weber, 1937, p. 66, Pl. 10, Figs. 29, 30). The latter species is known only from the pygidia. The pygidia of the new described species differ from the holotype of *P. jurezanensis* (TML 1951/5107; our Pl. II, Fig. 2) from the locality Sterlitamak, the Urals, in having a triangular shape instead of being parabolic as in *P. jurezanensis*, and in having less convex ribs. However, the other pygidium assigned by Weber (1937) to the same species (TML 1950/5107; our Pl. II, Fig. 8), coming from the

locality Jurezan, the Urals, is in those respects closer to the here described species, than to the holotype, having flat ribs and most probably a more triangular shape (the very end of pygidium is broken).

The both species compared have in common the long axis of 20 rings, being the longest of all so far known *Paladin* species, in this respect possessing the character of their Permian relative — *Pseudophillipsia*. However, the cranidium of *P. trigonopyge* has a very conservative structure. It is close to some Lower Carboniferous representatives of *Paladin*, i.e. *P. parilis* (Reed, 1942) and *P. shunnerensis* (King, 1914) in its anterior border placed well in front of the glabella, and median preoccipital lobe, which is very weakly marked, just in the form of a slight elevation of the median part of the posterior edge of the glabella. Both *P. trigonopyge* and *P. jurezanensis* have in common very reduced ornamentation, what differs them from many other representatives of *Paladin*. The ornamentation of axial ring typical for this genus, consisting of a row of tubercles which are elongated posteriorly, is lacking in these species.

Though, the structure of the pygidium differs slightly from the other representatives of *Paladin*, the characters of cranidium, very close to these found in most species of *Paladin*, do not allow one to establish, for the here described form, a new genus.

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HALSZKA OSMÓLSKA

O DWÓCH NOWYCH TRYLOBITACH Z WARSTW TRESKELODDEN HORNSUNDU
(VESTSPITSBERGEN)

Streszczenie

W pracy niniejszej opisane zostały dwa nowe trylobity z serii Treskelodden Hornsundu (Vestspitsbergen). Jeden z nich, *Ditomopyge roemeri spitsbergensis* n. subsp., jest blisko spokrewniony z *D. roemeri roemeri* (von Moeller, 1867) i *D. grüne-waltdi* (von Moeller, 1867), występującymi w piętrze gżelskim Uralu, Basenu Donieckiego i regionu Woroneża (ZSRR). Również drugi z opisanych trylobitów, *Paladin trigonopyge* n. sp., jest bardzo bliski górno-karbońskiemu gatunkowi *P. jurezanensis* (Weber, 1937) z Uralu. W związku z tym, autorce wydaje się bardziej prawdopodobne określenie wieku warstw Treskelodden jako górno-karboński, aniżeli dolno-permski.

ГАЛЬШКА ОСМУЛЬСКА

O ДВУХ НОВЫХ ТРИЛОБИТАХ ИЗ СЛОЕВ ТРЕСКЕЛОДДЭН ГОРНСУНДА
(ЗАПАДНЫЙ ШПИТСБЕРГЕН)

Резюме

В настоящей работе описано два новых трилобита из серии Трескелоддэн Горнсунда (Западный Шпитсберген). Один из них — *Ditomopyge roemeri spits-*

bergensis n. subsp. — близко родственный с *D. roeteri roeteri* (von Moeller, 1867) и с *D. grünwaldti* (von Moeller, 1867), распространенный в гжельском ярусе Урала, Донбасса и района Воронежа (СССР). Второй из описанных трилобитов — *Paladin trigonopyge* n. sp. — очень близок верхнекаменноугольному виду *P. jurezanensis* (Weber, 1937) из Урала.

В связи с этими фактами, автор считает более вероятным верхнекаменноугольный возраст слоев Трескелоддэн, чем нижнепермский.

PLATES

Plate I

Ditomopyge roemeri spitsbergensis n. subsp.

- Fig. 1. Cranidium, internal mould (ZNG Kr. 1221/560); \times 4.
Fig. 2. Librigena (ZNG Kr. 1248/560); \times 5.
Fig. 3. Young pygidium (ZNG Kr. 1239a/560); \times 10.
Fig. 4. Fragmentary pygidium showing ornamentation of the border (ZNG Kr. 1240/560); \times 5.
Fig. 5. Holotype pygidium, internal mould (ZNG Kr. 1213/560); \times 5.

Figs. 1-5: Treskelodden Beds, ?Upper Carboniferous, Treskelodden, Hornsund, Vestspitsbergen.

Ditomopyge roemeri roemeri (von Moeller)

- Fig. 6. Lectotype cephalon (TML 1881/5107). Upper Carboniferous, Jeleshovaia, the Urals, USSR; \times 3.
Fig. 7. Pygidium (TML 1884/5107). Upper Carboniferous, Ulu Tau, the Urals, USSR; \times 5.

Ditomopyge grünewaldti (von Moeller)

- Fig. 8. Pygidium (TML 1909/5107). Upper Carboniferous, the Urals, USSR; \times 3.



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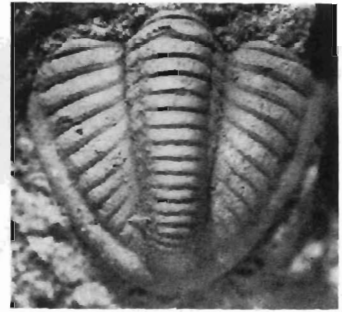
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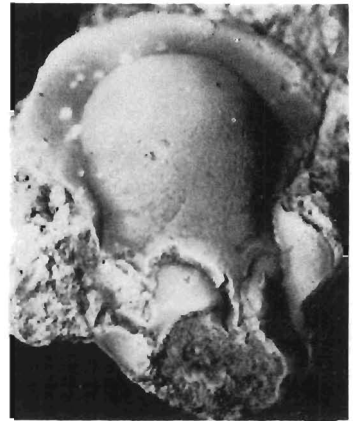
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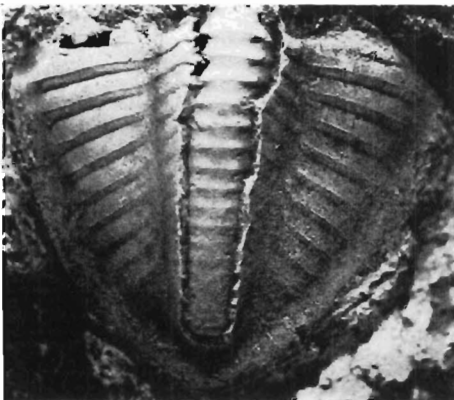
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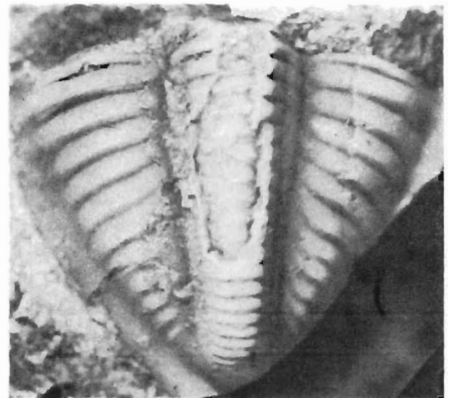
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Plate II

Paladin trigonopyge n. sp.

- Fig. 1. Fragment of the enrolled specimen (ZNG Kr. 1254/560). Treskelodden Beds, ?Upper Carboniferous, Hyrnejellet, Hornsund, Vestspitsbergen; \times 3.3.
- Fig. 2. Young pygidium (ZNG Kr. 1231/560); \times 6.7.
- Fig. 3. Holotype cranidium (ZNG Kr. 1220/560); \times 8.
- Fig. 4. Young cranidium (ZNG Kr. 1220a/560); \times 6.5.
- Fig. 5. Cranidium (ZNG Kr. 1220b/560); \times 6.
- Fig. 6. Pygidium (ZNG Kr. 1235/560); \times 4.6.
- Figs. 2-6: Treskelodden Beds, ?Upper Carboniferous, Treskelodden, Hornsund, Vestspitsbergen

Paladin jurezanensis (Weber)

- Fig. 7. Holotype pygidium (TML 1951/5107). Upper Carboniferous, Sterlitamak, the Urals, USSR; \times 4.2.
- Fig. 8. Pygidium (TML 1950/5107). Upper Carboniferous, Jurezan, the Urals, USSR; \times 3.