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UPPER VISEAN CONODONT FAUNA FROM THE
CARBONIFEROUS LIMESTONE NORTH OF KRZESZOWICE
(ENVIRONS OF CRACOW, POLAND)

(Pl. I—III)

*Górno-wizeńska fauna konodontów z wapienia węglowego
okolicy Krzeszowic koło Krakowa*

(Tabl. I—III)

Abstract: This paper concerns the conodonts found in the Upper Visean limestone in the Czernka Valley at Czerna N of Krzeszowice, 30 km W of Cracow.

One of the assemblages found, consisting of 73 species, represents the limit between the *Gnathodus mononodosus* and *Gnathodus girtyi collinsoni* zones, another assemblage, much less diversified, consisting of 17 species, seems to indicate the lower part of the D₃ zone, probably *Gnathodus mononodosus* zone.

INTRODUCTION

In the present paper are resumed the results of a study of the Upper Visean conodonts from the Carboniferous Limestone in the Czernka Valley at Czerna N of Krzeszowice, 30 km W of Cracow. Palaeontological descriptions and a detailed stratigraphical analysis will be published later. Upper Visean conodonts have not been hitherto described from Poland.

The conodont collection dealt with here is rather abundant, it comprises several thousand specimens. Eighty-two species have been determined. These belong to the following genera: *Apatognathus*, *Cavusgnathus*, *Euprioniodina*, *Geniculatus*, *Gnathodus*, *Hibbardella*, *Hindeodella*, *Hindeodina*, *Hindeodus*, *Ligonodina*, *Lonchodina*, *Magnilaterella*, *Metstognathus*, *Neoprioniodus*, *Ozarkodina*, *Prioniodina*, *Spathognathodus*. The most abundant is the stratigraphically important genus *Gnathodus*, somewhat less numerous are *Hindeodella*, *Neoprioniodus*, and *Apatognathus*.

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CARBONIFEROUS LIMESTONE OF THE CZERNKA VALLEY
AND DISTRIBUTION OF CONODONTS

The Carboniferous Limestone in Czernka was described by Z a r ę c z n y (1890, 1894). It was dated as uppermost Visean by J a r o s z (1926) on the brachiopods *Productus (Gigantoproductus) giganteus* M a r t. and *Productus (Gigantoproductus) latissimus* S o w.

Samples for the study of conodonts were taken from quarries in the Czernka Valley called „Kamieniołom z porfirem” (quarry near the porphyry intrusion), Czerwona Ścianka (red wall) and „Nad Młynówką” (over the mill-race), and also from some smaller outcrops to the SE of the latter.

The limestones are lithologically variable. Detailed lithological description is given by A l e x a n d r o w i c z and S i e d l e c k a (1964). Conodonts were found in Czerwona Ścianka, and in all outcrops to the SE of the quarry „Nad Młynówką”, in limestones with foraminifera and brachiopods; they are most abundant in dark grey bituminous limestones with numerous brachiopod shell fragments.

CONODONT FAUNA

The following species were found in Czerwona Ścianka:

- Apatognathus* cf. *petilus* V a r k e r
- Apatognathus* sp. A
- Apatognathus* sp. B
- Gnathodus girtyi simplex* D u n n
- Gnathodus* sp. A
- Hindeodella undata* B r a n s o n et M e h l
- Hindeodella* sp. A
- Ligonodina* sp. A
- Magnilaterella* sp. A
- Neoprioniodus antespathatus* C o l l i n s o n et D r u c e
- N. spathatus* H i g g i n s
- Neoprioniodus* cf. *camurus* R e x r o a d
- Neoprioniodus peracutus* (H i n d e)
- Neoprioniodus* cf. *scitulus* (B r a n s o n et M e h l)
- Prioniodina* sp. A
- Spathognathodus scitulus* (H i n d e)
- Spathognathodus* cf. *cristulus* Y o u n g q u i s t et M i l l e r

The following species were found in outcrops SE of the quarry „Nad Młynówką”:

- Apatognathus geminus* (H i n d e)
- Apatognathus libratus* V a r k e r
- Apatognathus petilus* V a r k e r
- Apatognathus scalenus* V a r k e r

Apatognathus varians Branson et Mehl
Apatognathus sp. C
Apatognathus sp. D
Cavusgnathus naviculus (Hinde)
Euprioniodina sp. A
Euprioniodina sp. B
Euprioniodina sp. C
Euprioniodina sp. D
Geniculatus cf. *claviger* (Roundy)
Gnathodus bilineatus (Roundy)
Gnathodus commutatus (Branson et Mehl)
Gnathodus girtyi collinsoni Rhodes, Austin et Druce
Gnathodus girtyi girtyi Hass
Gnathodus girtyi simplex Dunn
Gnathodus homopunctatus Ziegler
Gnathodus symmutatus Rhodes, Austin et Druce
Gnathodus sp. B
Gnathodus sp. C
Gnathodus sp. D
Gnathodus sp. E
Hibbardella (Hibbardella) milleri Rexroad
Hibbardella (Hibbardella) cf. parva Rhodes, Austin et Druce
Hibbardella (Hibbardella) sp. A
Hindeodella cooperi (Elias)
Hindeodella montanaensis (Scott)
Hindeodella subtilis Ulrich et Bassler
Hindeodella tenuis Clarke
Hindeodella undata Branson et Mehl
Hindeodella cf. *ibergensis* Bischoff
Hindeodella cf. *secarata* Collinson et Druce
Hindeodella cf. *segaformis* Bischoff
Hindeodella cf. *tenuis* Clarke
Hindeodella sp. B
Hindeodella sp. C
Hindeodella sp. D
? *Hindeodina* sp.
Hindeodus alatooides (Rexroad et Burton)
Hindeodus sp.
Ligonodina cyra Cooper
Ligonodina levis Branson et Mehl
Ligonodina tenuis Branson et Mehl
Ligonodina sp. B
Lonchodina paraclarki Hass
Lonchodina cf. *furnischi* Rexroad
Lonchodina sp. A
Lonchodina sp. B
Lonchodus sp.
Magnilaterella complectens (Clarke)
Magnilaterella clarkei Rhodes, Austin et Druce
Magnilaterella cf. *robusta* Rexroad et Collinson
Mestognathus bipluti Higgins
Mestognathus cf. *neddensis* Rhodes, Austin et Druce
Mestognathus sp. A

Neoprioniodus antespathatus Collinson et Druce
Neoprioniodus montanaensis (Scott)
Neoprioniodus scitulus (Branson et Mehl)
Neoprioniodus cf. recurvus Branson et Mehl
Neoprioniodus spathatus Higgins
Neoprioniodus peracutus (Hinde)
Neoprioniodus sp. A
Ozarkodina plumula Collinson et Druce
Ozarkodina sp. A
Ozarkodina sp. B
Ozarkodina sp. C
Prioniodina laevipostica (Rexroad et Collinson)
Prioniodina subaequalis (Higgins)
Prioniodina sp. B
Spathognathodus scitulus (Hinde)
Spathognathodus scitulus cf. subs. A Rhodes, Austin et Druce

STRATIGRAPHICAL CONCLUSIONS

The abundant and diversified assemblage from the outcrops SE of the quarry „Nad Młynówką” consisted of 73 species. Seventeen species were found in Czerwona Ścianka. The fauna is strikingly similar to those of Great Britain, allowing a correlation with the zones established by Rhodes, Austin et Druce (1969). These authors distinguished in the British uppermost Viséan the zones *Gnathodus mononodosus* (Cu III β) i *Gnathodus girtyi collinsoni* (Cu III γ).

In the outcrops SE of the quarry „Nad Młynówką”, stratigraphically significant species may be distributed in three groups:

1. Species indicative of the *Gnathodus girtyi collinsoni* zone. These are: *Gnathodus girtyi collinsoni* Rhodes, Austin et Druce, *Prioniodina subaequalis* (Higgins), *Neoprioniodus scitulus* Branson et Mehl, *Ligonodina levis* (Branson et Mehl).

2. Species common for the *Gnathodus mononodosus* and *Gnathodus girtyi collinsoni* zones, namely *Gnathodus girtyi simplex* Dunn, *G. girtyi girtyi* Hass, and *G. bilineatus* (Roundy).

3. Species typical for the *Gnathodus mononodosus* zone, and disappearing about the limit of the *Gnathodus mononodosus* and *Gnathodus girtyi collinsoni* zones, namely, *Mestognathus neddensis* Rhodes, Austin et Druce, and *M. bipluti* Higgins. The stratigraphical value of the last form is however somewhat doubtful, though Rhodes, Austin and Druce (op. cit.) believed that this form disappears at the limit of the *Gnathodus mononodosus* and *Gnathodus girtyi collinsoni* zones, but according to Higgins (1961), this species continues till the Namurian in North Staffordshire.

It seems therefore that the present assemblage is transitional between the *Gnathodus mononodosus* and *Gnathodus girtyi collinsoni* zones. It

consists of older forms considered by most authors to disappear about the limit of the *Gnathodus mononodosus* and *Gnathodus girtyi collinsoni* zones, together with *Gnathodus girtyi collinsoni* Rhodes, Austin et Druce, accompanied by some species characteristic of the *Gnathodus girtyi collinsoni* zone.

The outcrop at Czerwona Ścianka yielded 17 forms; 10 were determined specifically and 7 generically. The assemblage allows only an approximate dating.

Gnathodus girtyi simplex Dunn appears in the uppermost D₂ zone, indicating that the age is not older than the *Gnathodus mononodosus* zone, which agrees with the presence of such species as *Neoprioniodus scitulus* Branson et Mehl, *Neoprioniodus spathatus* Higgins and *Hindeodella undata* Branson et Mehl.

These data, together with the position of the beds outcropped in Czerwona Ścianka, most probably below those dealt with above, suggest the lower D₃ age, probably the *Gnathodus mononodosus* zone.

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STRESZCZENIE

Stwierdzono 82 gatunki konodontów występujących w dolnokarbońskich wapieniach doliny Czernki na zachód od Krakowa.

Wyodrębniono dwa zespoły. Pierwszy liczy 73 gatunki i reprezentuje granicę poziomów *Gnathodus mononodosus* (Cu III β) i *Gnathodus girtyi collinsoni* (Cu III γ). Drugi liczy 17 gatunków i reprezentuje dolne partie D₃, prawdopodobnie poziom *Gnathodus mononodosus*.

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EXPLANATION OF PLATES OBJAŚNIENIE TABLIC

Plate — Tablica I

All specimens magnified $\times 60$

- Fig. 1. *Gnathodus bilineatus* (R o u n d y). 1a — Oral view of specimen DC 64, 1b — Aboral view of specimen DC 64, 1c — Outer lateral view of specimen DC 64
- Fig. 2. *Gnathodus commutatus* (B r a n s o n e t M e h l). 2a — Oral view of specimen DC 121, 2b — Aboral view of specimen DC 121, 2c — Inner lateral view of specimen DC 121, 2d — Outer lateral view of specimen DC 121
- Fig. 3. *Gnathodus girtyi collinsoni* R h o d e s, A u s t i n e t D r u c e. 3a — Oral view of specimen DC 354, 3b — Aboral view of specimen DC 354, 3c — Outer lateral view of specimen DC 354, 3d — Inner lateral view of specimen DC 354
- Fig. 4. *Gnathodus girtyi simplex* D u n n. 4a — Oral view of specimen DC 276, 4b — Aboral view of specimen DC 276, 4c — Inner lateral view of specimen DC 276, 4d — Outer lateral view of specimen DC 276

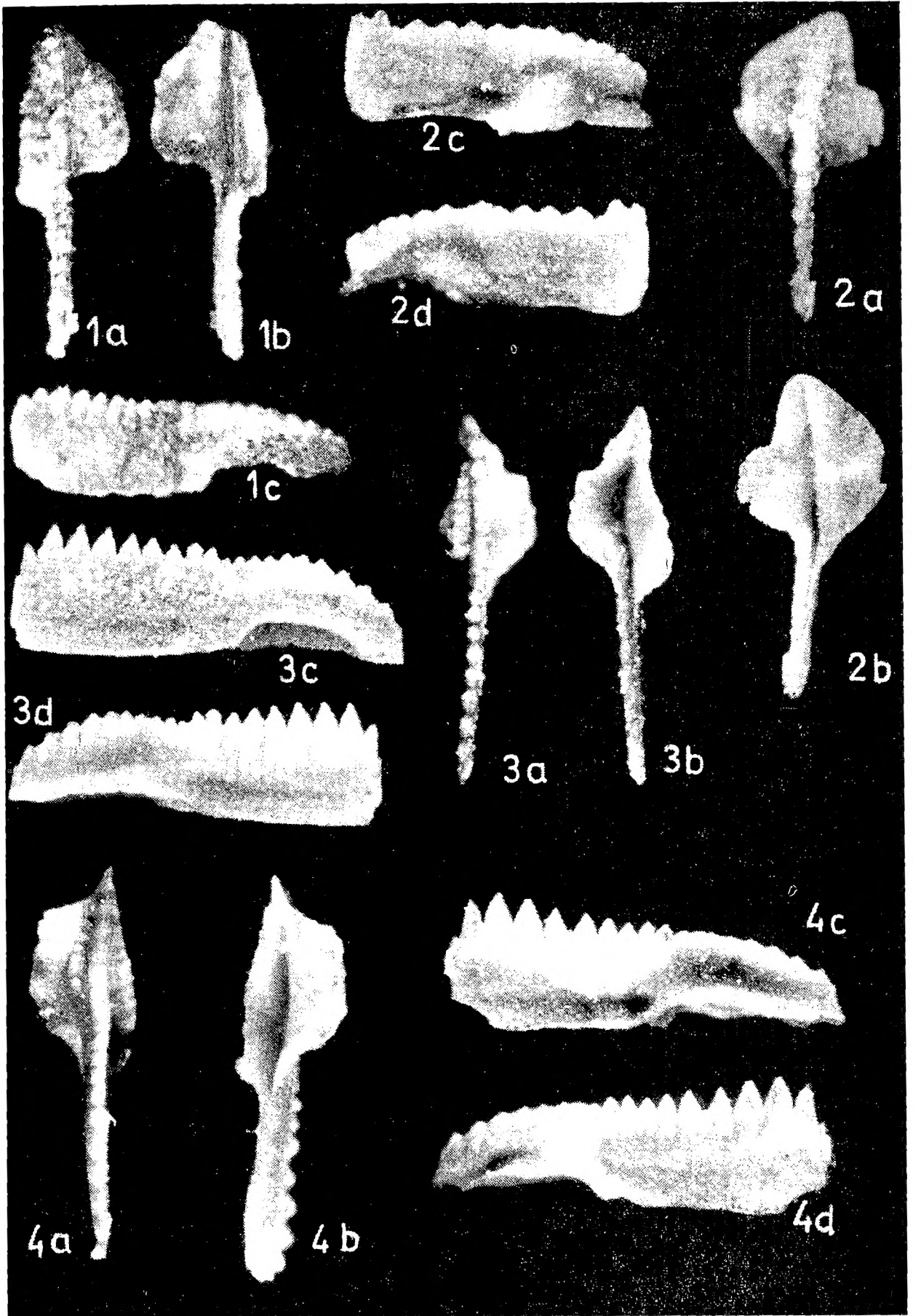
Plate — Tablica II

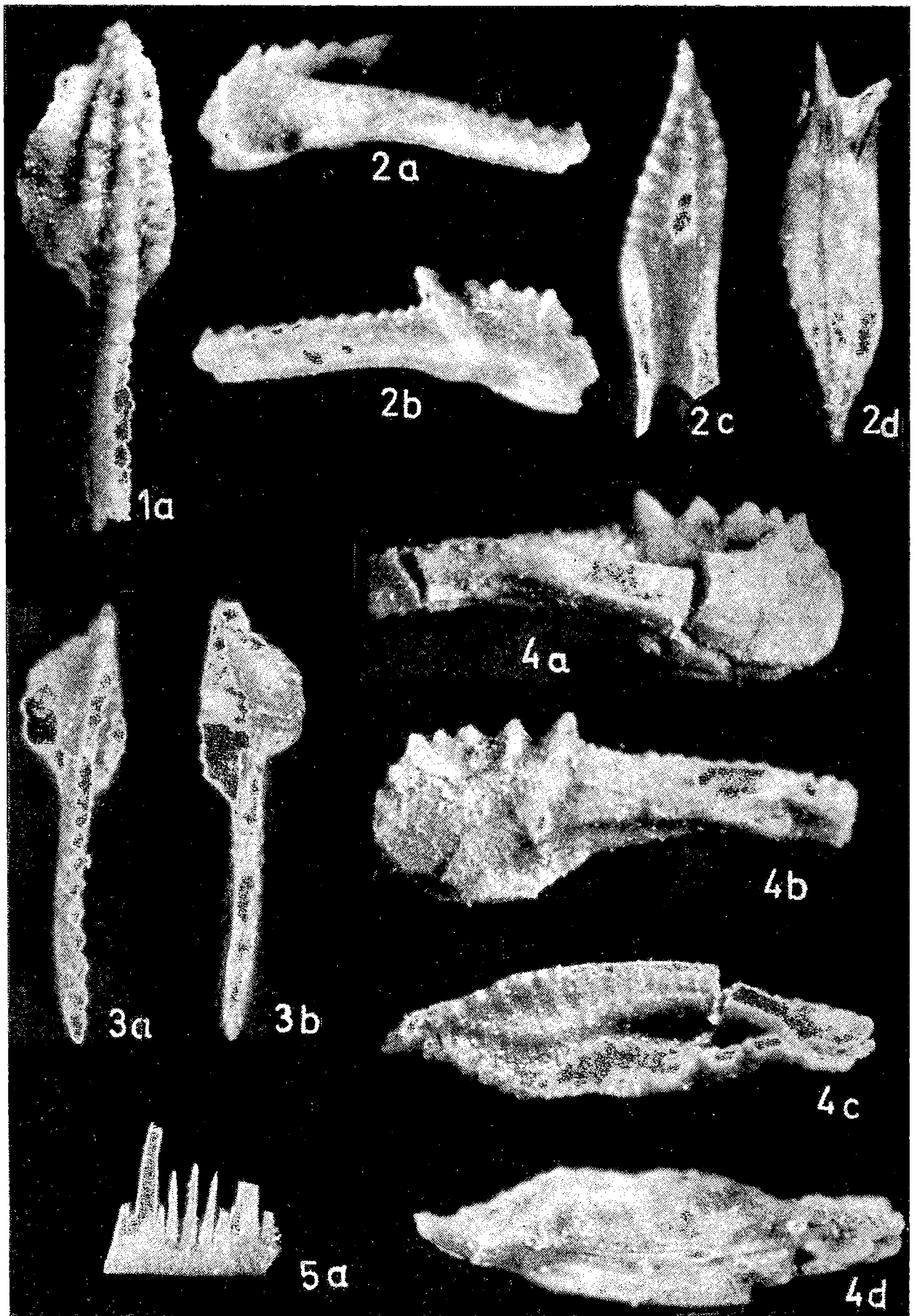
- Fig. 1. *Gnathodus girtyi girtyi* H a s s. 1a — Oral view of specimen DC 175. $\times 60$
- Fig. 2. *Mestognathus bipluti* H i g g i n s. 2a — Inner lateral view of specimen DC 440, $\times 60$, 2b — Outer lateral view of specimen DC 440, $\times 60$, 2c — Oral view of specimen DC 440, $\times 60$
- Fig. 3. *Gnathodus girtyi simplex* D u n n. 3a — Oral view of specimen DC 6, $\times 60$, 3b — Aboral view of specimen DC 6, $\times 60$
- Fig. 4. *Mestognathus neddensis* R h o d e s, A u s t i n e t D r u c e. 4a — Inner lateral view of specimen DC 286, $\times 40$, 4b — Outer lateral view of specimen DC 286, $\times 40$, 4c — Oral view of specimen DC 286, $\times 40$, 4d — Aboral view of specimen DC 286, $\times 40$
- Fig. 5. *Hindeodella undata* B r a n s o n e t M e h l. 5a — Lateral view of specimen DC 465, $\times 60$

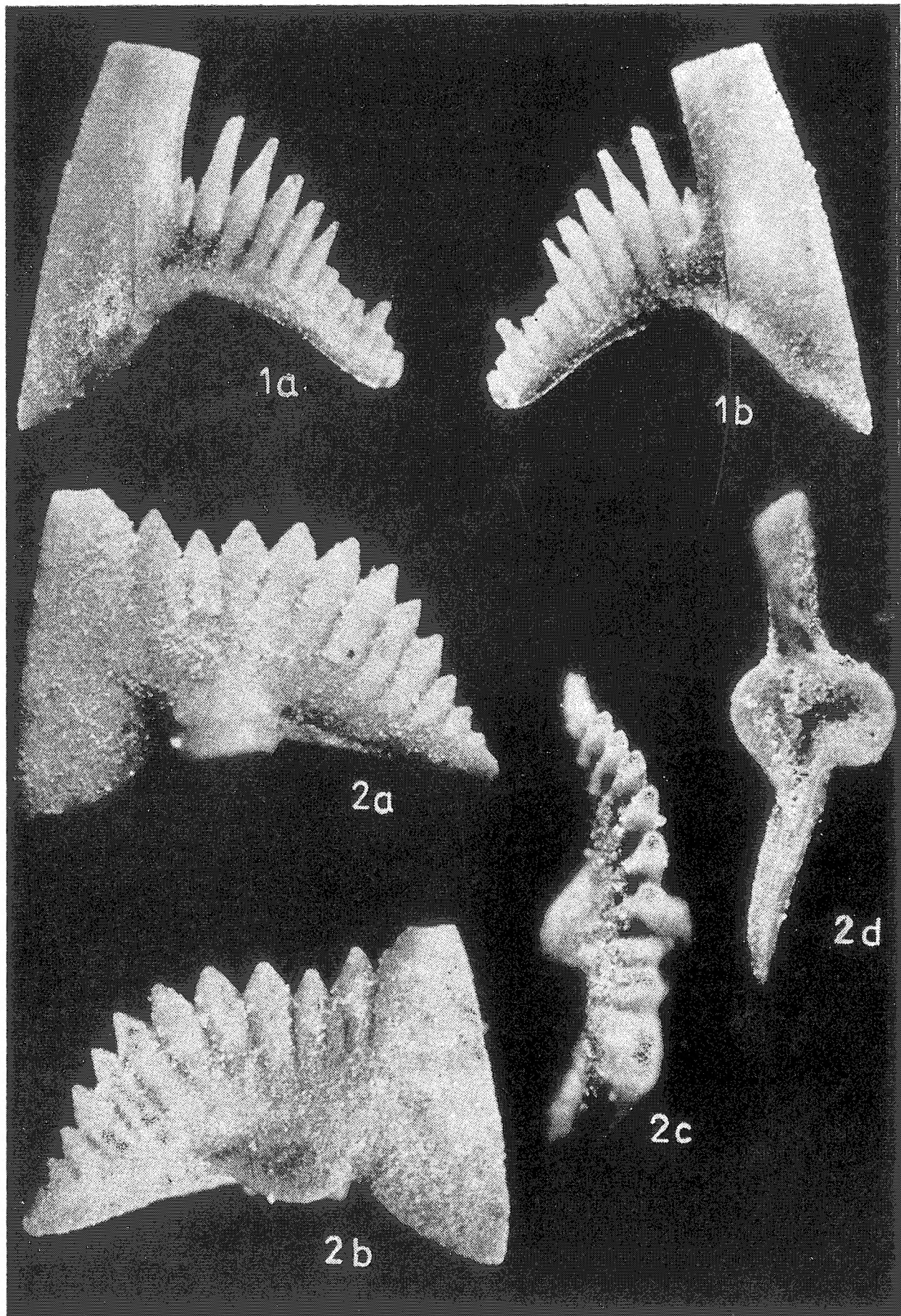
Plate — Tablica III

All specimens magnified $\times 60$

- Fig. 1. *Neoprioniodus scitulus* (Branson et Mehl). 1a — Lateral view of specimen DC 374, 1b — Lateral view of specimen DC 374
- Fig. 2. *Spathognathodus scitulus* (Hinde). 2a — Lateral view of specimen DC 98, 2b — Lateral view of specimen DC 98, 2c — Oral view of specimen DC 98, 2d — Aboral view of specimen DC 98







A. Gromczakiewicz-Łomnicka