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Evolution of the Lower Carboniferous conodont genus *Mestognathus*

ABSTRACT: A new species of the conodont genus *Mestognathus* is recognized in the Lower Carboniferous carbonates of the Cracow Upland, southern Poland. It appears much earlier than the base of the Lower Viséan, from which the genus *Mestognathus* has hitherto been noted. The phyletic lineage of *M. groessensi* sp.n. → *M. beckmanni* → *M. bipluti*, Middle Tournaisian to lowermost Namurian in age, is shown from the carina and the inner parapet characteristics which illustrate a progressive trend in the evolution of *Mestognathus*. Additionally, the taxonomy of the genus *Mestognathus* is revised. It is suggested that *Mestognathus* was restricted only to the shelf area, from its margin to the intertidal zone. The rare basinal settings of this genus are interpreted as a result of synsedimentary re-deposition affected by basinward debris flow.

INTRODUCTION

The Lower Carboniferous is the time interval of the greatest morphological diversity of conodont genera. Those short-ranging with distinctive shape, often represented by only a few species, have particularly been useful as excellent biostratigraphic keys, for instance *Scaliognathus*, *Dollymae*, *Doliognathus*, and *Mestognathus*.

The genus *Mestognathus* is regarded as characteristic of the Viséan. It has not been included into the apparatus nomenclature, and it used here as disjunct element of an unknown organism. This genus was erected by Bischoff (1957) with *Mestognathus beckmanni* as the type species, collected from the Gox Zone of Germany. The second species, *M. bipluti* was described by Higgins (1961) from the Lower Namurian strata of North Staffordshire. As apparent from the hereafter accepted taxonomy of *Mestognathus*, all the other formerly used species of the genus (cf. Globensky 1967; Rhodes, Austin & Druce 1969) represent junior synonyms of *M. beckmanni* and *M. bipluti*.

Thus, the two accepted species of *Mestognathus*, namely *M. beckmanni* and *M. bipluti* constituted the only hitherto known taxa of the

genus. They mark the stratigraphic range of the genus from the base of the Lower Viséan until the Lower Namurian. There are also, however, some data (Lane, Sandberg & Ziegler 1980) on earlier occurrences of *Mestognathus*. The type species, *M. beckmanni* originates just over the Tournaisian/Viséan boundary and it is used as index fossil for the Lower Viséan (Groessens 1974; Conil, Groessens & Pirlet 1976). The species, *Mestognathus bipluti* ranges from the Upper Viséan into the Lower Namurian, Pendleian Stage (Higgins 1975). The genus *Mestognathus* is widespread in Europe, but usually it is represented by a few specimens only.

In Poland (cf. Text-fig. 1), the genus *Mestognathus* was first noted to occur (Gromczakiewicz-Łomnicka 1974) in uppermost Viséan limestones of the Cracow Upland, southern part of the Polish Jura, where it is represented by *M. bipluti*. Moreover, single specimens of *M. beckmanni* were recognized in the borehole section situated NE of Olkusz

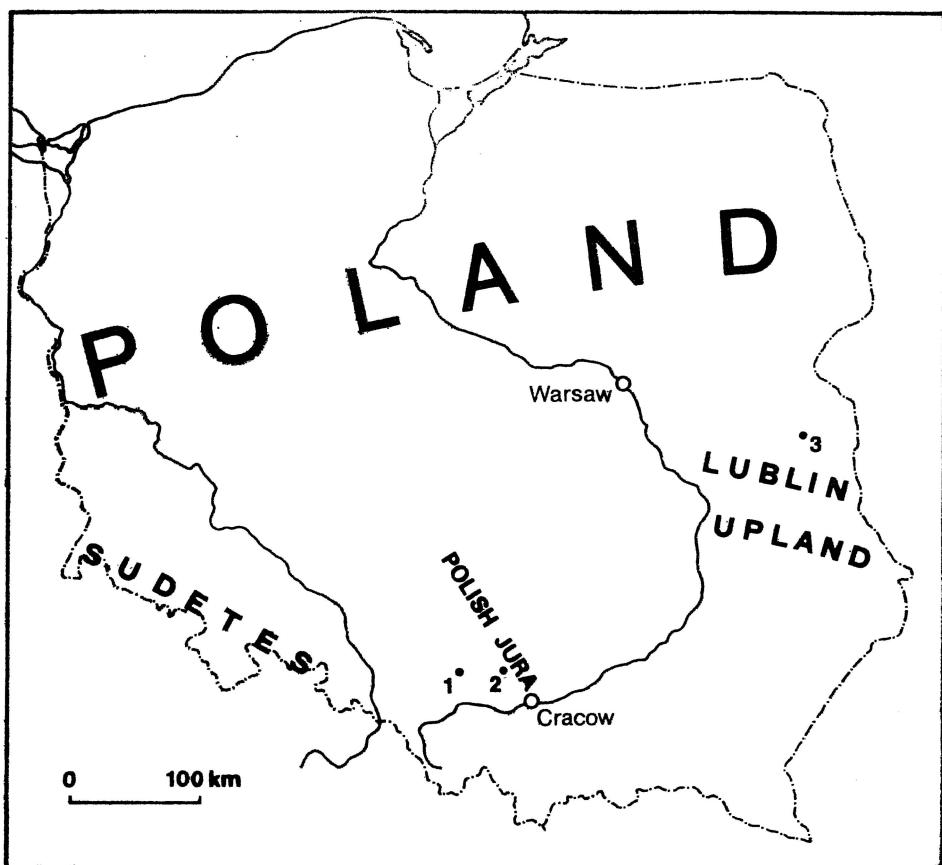


Fig. 1. Location map. The numbers indicate the approximate geographic position of the investigated boreholes from: 1 — Olkusz area, 2 — Sosnowiec, 3 — Lublin Upland

(Narkiewicz & Matyja 1979) and also in the Sudetes (Chorowska 1978). In the Lublin Coal Basin, the genus *Mestognathus* represented by *M. bipluti* was reported from the *nodosus* Zone (Skompski & Soboń-Podgórska 1980).

In other European countries, the genus *Mestognathus* is known from Portugal (van den Boogaard 1963, Higgins 1974), Spain (Marks & Wensink 1970, Higgins 1974, Buchroithner 1979, van den Boogaard & Vázquez Guzmán 1981, Higgins & Wagner-Gentis 1982), France (Perret 1977), England (Higgins 1961, 1975; Rhodes, Austin & Druce 1969; Reynolds 1970), Wales (Aldridge, Austin & Husri 1968, Austin & Aldridge 1973, Austin 1974), Ireland (Austin & Husri 1974, Austin & Mitchell 1975), Belgium (Groessens 1971, 1974; Groessens & Noël 1974; Conil, Groessens & Pirlet 1976), and Germany (Bischoff 1957, Voges 1959, Witten 1979).

Outside Europe the genus *Mestognathus* was recorded in Australia (Druce 1970), North Africa (Remack-Petitot 1960), and in Nova Scotia (Globensky 1967, von Bitter & Plint-Geberl 1982) which displays the faunal elements of the European type. According to Higgins (1981), *Mestognathus* is clearly restricted areally and can be used to identify the Eurasian conodont province, which was partially separated from the Midcontinental area of North America during late Viséan-Namurian time.

The Lower Carboniferous shelf carbonates in the Cracow Upland, have recently been under investigation of their conodont faunas. The genus *Mestognathus* has been recognized in a few boreholes of the Olkusz area and near Sosnowiec (Text-fig. 1), but it appears much earlier than the base of the Lower Viséan. It is represented by *Mestognathus groessensi* sp.n.* and *M. beckmanni*. The oldest appearance of *M. groessensi* sp.n. is in the *isosticha* — Upper *crenulata* Zone, somewhat earlier than the last occurrence of *Siphonodella obsoleta*. Associated with *M. groessensi* sp.n. are *Gnathodus delicatus*, *G. punctatus* and *G. typicus* morphotype 1. The new species, *M. groessensi* sp.n. ranges into the *anchoralis-latus* Zone but does not extend as high as the extinction of *Scaliognathus*. The species *M. beckmanni* makes its first appearance in the Cracow Upland in the base of the *texanus* Zone, thus the order of ranges of *Scaliognathus* and *M. beckmanni* is the same as that in Belgium (cf. Groessens 1974).

* When this paper was in proofs, it appeared that P. von Bitter (personal communication, October 1982), Royal Ontario Museum, Ch. Sandberg, US Geological Survey and M. Orchard, Geological Survey of Canada, had been working together on a monograph of *Mestognathus*. They also have found a form of *Mestognathus* older than *M. beckmanni*. Their pre-*beckmanni* forms of *Mestognathus* seem to be very close with *M. groessensi* sp.n. described herein.

The applicated conodont zones are taken from preliminary standard zonation of Sandberg & *al.* (1978) and Lane, Sandberg & Ziegler (1980), and also from Meischner (1970) and Higgins (1975).

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SYSTEMATIC DESCRIPTION

Genus *MESTOGNATHUS* Bischoff, 1957

Type species: *Mestognathus beckmanni* Bischoff, 1957

Diagnosis: A genus characterized by a boat-like platform, displaying Class IV symmetry, having a right-sided blade outer parapet and carina. Basal cavity in juvenile specimens is open but ontogenetically becomes small or produces a pit.

Remarks: — The genus is similar to *Scaphignathus* of the Upper Devonian, which is probably an older homeomorph. Austin (1973) suggested that they performed a similar function. This genus is also closely related to *Cavusgnathus* and *Clydagnathus*, from which it differs by having a prominently developed carina and by a much smaller basal cavity.

Range. — From the *isosticha*-Upper *crenulata* Zone (Middle Tournaisian) into the *Kladognathus*-*Gnathodus girtyi simplex* Zone, i.e. the Pendleian (E_1), lowermost Namurian (Higgins 1975).

Mestognathus beckmanni Bischoff, 1957

(Pl. 1, Figs 3—4 and Pl. 2, Figs 3—5)

1957. *Mestognathus beckmanni* n. sp.; Bischoff, p. 37, Pl. 2, Figs 4—6 and 9.
 1967. *Mestognathus dhuensis* n. sp.; Globensky, pp. 442—443, Pl. 57, Figs 21—24.
 1969. *Mestognathus beckmanni* Bischoff; Rhodes, Austin & Druce, pp. 150—151, Pl. 15, Fig. 7a-d.
 1969. *Mestognathus neddensis* sp. nov.; Rhodes, Austin & Druce, pp. 153—154, Pl. 15, Figs 4—5 (only).
 1970. *Mestognathus beckmanni* Bischoff; Druce, pp. 74—75, Pl. 13, Figs 4—5.
 1970. *Mestognathus neddensis* Rhodes, Austin & Druce; Druce, p. 75, Pl. 13, Figs 2—3.
 1971. *Mestognathus beckmanni* Bischoff; Groessens, Pl. 2, Fig. 8.
 1973. *Mestognathus beckmanni* Bischoff; Butler, p. 501, Pl. 58, Figs 1—2.
 1974. *Mestognathus beckmanni* Bischoff; Austin & Husri, Pl. 5, Fig. 8.
 1974. *Mestognathus neddensis* Rhodes, Austin & Druce; Austin & Husri, Pl. 5, Figs 2 and 7.
 1975. *Mestognathus beckmanni* Bischoff; Austin & Mitchell, p. 52, Pl. 1, Fig. 21.
 1982. *Mestognathus* spp.; von Eitter & Plint-Geberl, pp. 198—200, Pl. 4, Figs 1—7.

Holotype: As the original designation by Bischoff (1957, Pl. 2, Fig. 4a-d).

Material: More than 50 specimens.

Revised diagnosis: A species of *Mestognathus* that has inner (left) parapet expanded and raised to form one denticle at the anterior end. The carina extends to the anterior tip, and a minute basal cavity is located medially.

Remarks. — The basal cavity is small in the adult specimens (Pl. 2, Fig. 3b) but a narrow and open one in the juveniles. Some specimens show the inner parapet pointed rectangularly, rather than bear one distinct denticle. In the anterior third, the carina is often weakly developed as a smooth ridge, what differs it from that of *M. bipluti*. The species is distinguished from its predecessor, *M. groessensi* sp.n., which has a rounded inner parapet, clearly asymmetrical and larger basal cavity, and shorter carinae (cf. Pl. 1, Figs 1—2) The species is connected with *M. bipluti* by transitional forms which appear in the *bilineatus bilineatus* Zone; these specimens bear second germ denticle in the inner parapet (Pl. 2, Figs 3—4).

Range. — Base of the *texanus* Zone into the *bilineatus bilineatus* Zone.

ANTERIOR

POSTERIOR

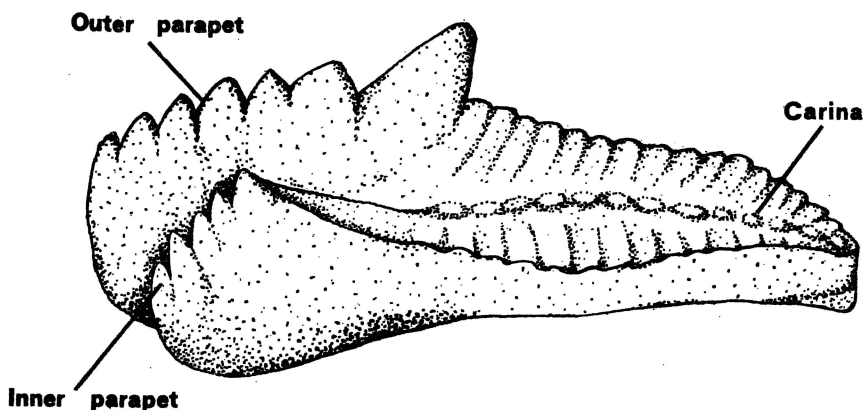


Fig. 2. Morphological terms of *Mestognathus* used in the text

Mestognathus bipluti Higgins, 1961
(Pl. 1, Figs 5—8 and Pl. 2, Figs 7—8)

1961. *Mestognathus bipluti* sp. nov.; Higgins, pp. 216—217, Pl. 10, Figs 1—2.

1969. *Mestognathus bipluti* Higgins; Rhodes, Austin & Druce, pp. 152—153, Pl. 15, Figs 1—3 and 8.

1969. *Mestognathus neddensis* sp. nov.; Rhodes, Austin & Druce, pp. 153—154, Pl. 15, Fig. 6 (only).

1973. *Mestognathus neddensis* Rhodes, Austin & Druce; Austin & Aldridge, Pl. 1, Fig. 12.

1974. *Mestognathus bipluti* Higgins; Austin, Pl. 1, Fig. 22.

1974. *Mestognathus bipluti* Higgins; Austin & Husri, Pl. 5, Figs 9—10.

1975. *Mestognathus bipluti* Higgins; Higgins, p. 62, Pl. 8, Figs 8 and 10.

1980. *Mestognathus bipluti* Higgins; Skompski & Soboń-Podgórska, Pl. 5, Figs 11 and 13—14.

Holotype: As the original designation by Higgins (1961, Pl. 10, Fig. 1).

Material: About 20 specimens.

Revised diagnosis: A species of *Mestognathus* with an inner parapet developed as a denticulate crest. It has denticles, at least three in number but usually six. The carina is slightly curved in the middle of the unit and extends to the anterior tip; it tends to be distinctly developed as a row of fused denticles along the anterior third. The aboral side displays a small cavity or a basal pit.

Remarks. — The inner parapet may extend farther anteriorly than the blade (outer parapet). In adult specimens, the surface ornamentation of the platform is rudimentary. In the transitional field between *M. beckmanni* and *M. bipluti*, one of the specimens bears the posterior platform reduced identically (cf. Pl. 2, Fig. 4) as the forms described by Austin & Aldridge (1973, Pl. 2, Fig. 12) from the Upper Viséan of the Isle of Man, and by Higgins (1975, Pl. 10, Figs 12—13) from the lowermost Namurian of England. In other respects, these all specimens are closely related to *M. bipluti*. Future work may document the division of the species into two different morphotypes. The species is easily distinguished from other species of *Mestognathus* that have a denticulate inner parapet, although small juveniles may show the developmental stage of *M. beckmanni* (Pl. 2, Fig. 7).

Range. — From the *nodosus* Zone into the *Kladognathus-Gnathodus girtyi simplex* Zone.

Mestognathus groessensi sp.n.
(Pl. 1, Figs 1—2 and Pl. 2, Figs 1—2 and 6)

1969. *Scaphignathus?* sp. A; Rhodes, Austin & Druce, p. 218, Pl. 2, Fig. 13a-c.

1969. *Scaphignathus?* sp. B; Rhodes, Austin & Druce, p. 219, Pl. 2, Fig. 12a-c.

Holotype: The specimen illustrated in Pl. 1, Fig. 1.

Derivation of the name: In honour of Dr. Eric Groessens, Geological Survey of Belgium, in recognition of his contribution to the Carboniferous conodont biostratigraphy.

Type locality: Borehole WB-64, east of Olkusz, Polish Jura.

Type horizon: The *isosticha*-Upper *crenulata* Zone (Middle Tournaisian).

Diagnosis: A species of *Mestognathus* characterized by a bluntly pointed and rounded inner parapet. The carina is developed in the posterior part of the unit; it extends to the midpoint of the platform or, in adult specimens, a little away where it curves inwards to meet the inner lateral margin. The basal cavity is large and asymmetrical being expanded on the inner side; it is never as wide as the platform.

Material: 16 specimens.

Remarks. — Early forms from the *isosticha*-Upper *crenulata* Zone have clearly asymmetrical basal cavity reminiscent of *Clydagnathus*, which turns into a vast pseudokeel (see Pl. 1, Fig. 2). Their platform tends to be broader than that of specimens from the *anchoralis-latus* Zone (cf. Pl. 2, Fig. 2), the blade of which may be present between a medial and lateral position.

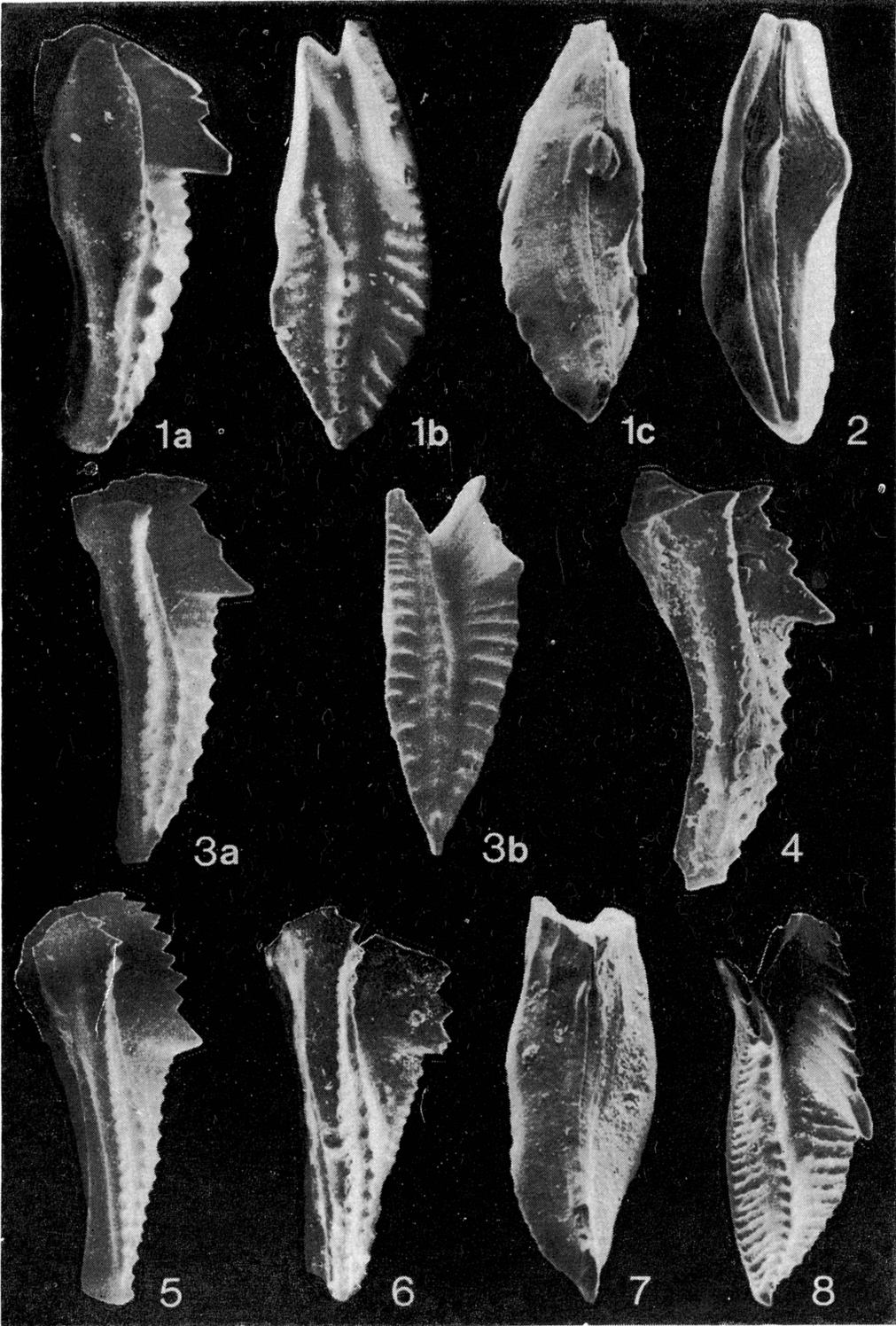
The specimens reported by Rhodes, Austin & Druce (1969) as „*Scaphignathus?* sp. A” and „*Scaphignathus?* sp. B” from the North Crop of the South Wales Coalfield and here transferred to *M. groessensi* sp.n. (see synonymy), were recognized in the *Spathognathodus costatus costatus*-*Gnathodus delicatus* Zone (there are difficulties to correlate precisely the conodont fauna of this zone with the German succession, but most certainly it corresponds to pre-*anchoralis* time). Because of the presence of a large, asymmetrical basal cavity, these specimens have not been assigned by Rhodes, Austin & Druce to *Mestognathus*; based on the large basal cavities occurring in juveniles of *Scaphignathus*, Rhodes, Austin & Druce (1969) placed them tentatively into this very genus, i.e. *Scaphignathus*.

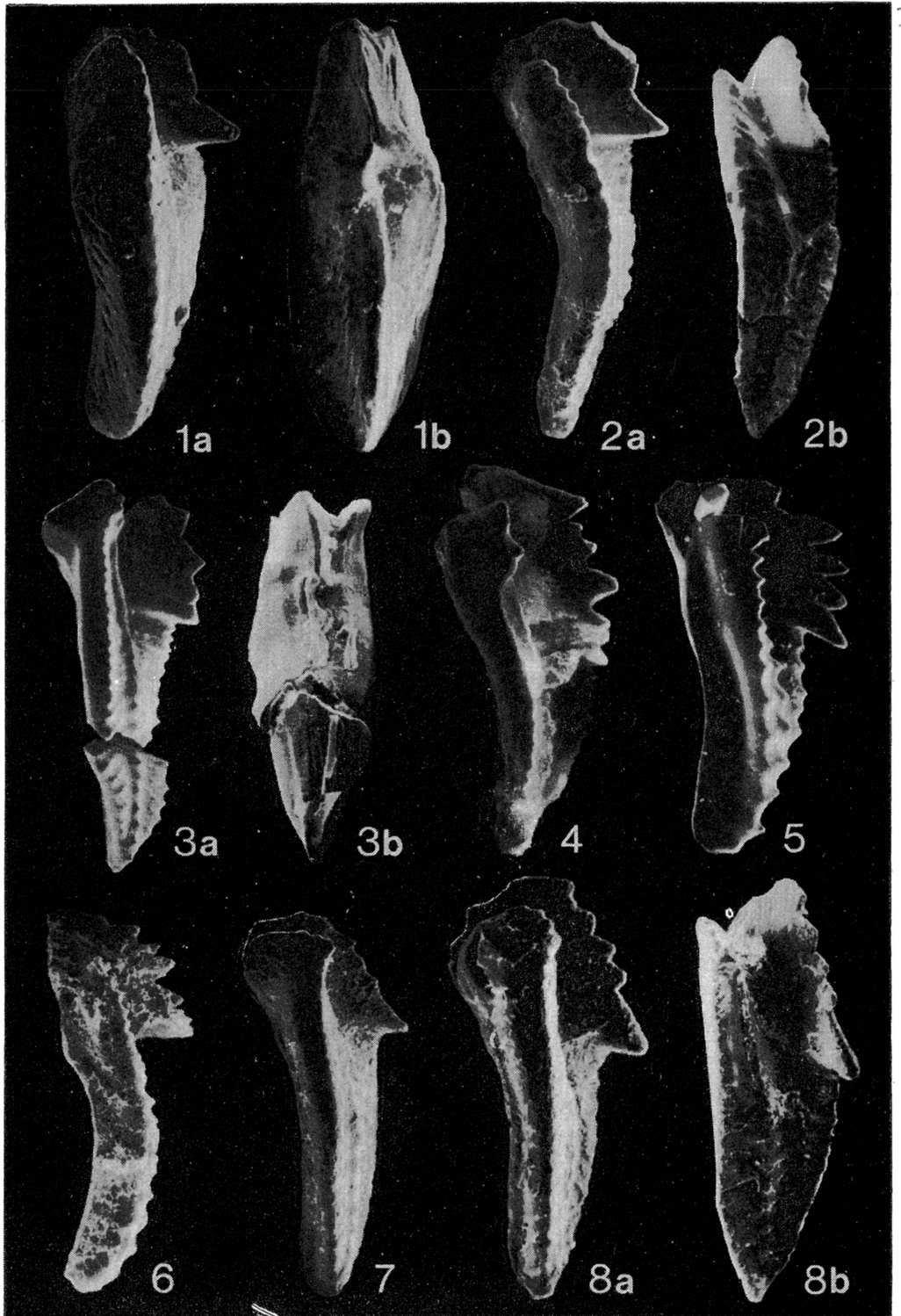
The new species, *M. groessensi* sp.n., differs both from *M. beckmanni* and *M. bipluti* by its short carina, rounded and undenticulated inner parapet, and by the presence of an asymmetrical and relatively large basal cavity. This species is also similar to those of the genus *Clydagnathus*, from which it evolved, but differs by having a carina.

Range. — From the *isosticha*-Upper *crenulata* Zone into the *anchoralis-latus* Zone.

PLATE 1

- 1—2 — *Mestognathus groessensi* sp.n.; 1 — holotype, WB-64 borehole near Olkusz (depth 125 m), a — inner lateral view, $\times 55$; b — upper view, $\times 55$; c — lower view, $\times 50$; 2 — WB-64 (depth 165 m), lower view of early form with asymmetrical, *Clydagnathus*-like basal cavity, $\times 55$
- 3—4 — *Mestognathus beckmanni* Bischoff; 3 — Sosnowiec (depth 1782.5 m), a — inner lateral view, $\times 50$; b — upper view, $\times 50$; 4 — Sosnowiec (depth 1779 m), juvenile specimen, inner lateral view, $\times 80$
- 5—8 — *Mestognathus bipluti* Higgins; 5 — Rudno (depth 759 m), inner lateral view, $\times 35$; 6 — Rudno (depth 759 m), inner lateral view, $\times 59$; 7 — Włodawa (depth 408 m), lower view, $\times 45$; 8 — Rudno (depth 759 m), oblique upper view, $\times 35$





PHYLOGENY OF THE GENUS MESTOGNATHUS

During the Lower Carboniferous the genus *Mestognathus*, as a disjunct element, yielded phylogenetic changes important both for taxonomy and biostratigraphy. This genus evolved from *Clydagnathus* within the *isosticha*-Upper *crenulata* Zone. As presently conceived, it contains three species: the oldest is *M. groessensi* sp.n., the second *M. beckmanni* Bischoff, 1957, and the most advanced *M. bipluti* Higgins, 1961. In the presented concept of phyletic succession (Text-fig. 3), the other earlier described species, *M. dhuensis* Globensky (1967) and *M. neddensis* Rhodes, Austin & Druce (1969), are regarded as junior synonyms of *M. beckmanni* and *M. bipluti*, respectively.

The morphologic changes between particular species and their ontogeny show that only two parts of the conodont platform illustrate a progressive trend in the evolution of *Mestognathus*. These are the inner parapet and the carina (cf. Text-fig. 2), the shape of which are characteristic of species significance. The most primitive species, *M. groessensi* sp.n., has the inner parapet bluntly rounded and the carina developed in the posterior half of the unit. It extends the midpoint of platform where it curves inwards to meet the inner lateral margin. At the top of the *anchoralis-latus* Zone, *M. groessensi* gave rise to *M. beckmanni* by the development of the inner parapet to produce one distinct denticle at the anterior tip. The carina in this species occupies a median position and, as an undenticulated ridge, it joins the inner anterior tip. Within the *bilineatus bilineatus* Zone, there appear forms transitional to *M. bipluti*, and bearing an additional second denticle on the inner parapet. This stage of evolution of *Mestognathus* is not well documented in the investigated sections, because *M. bipluti* (recognized in the *nodosus* Zone) is characteristic by the inner parapet developed as a denticulate crest which consists of 3 or more (up to 6) small denticles. The carina continues in a way very similar to that of *M. beckmanni*, but its anterior part is composed of small fused denticles.

The all species of *Mestognathus* exhibit during their ontogeny a reduction of the basal cavity, the size of which is relatively large and

PLATE 2

- 1—2, 6 — *Mestognathus groessensi* sp.n.; 1 — WB-64 borehole near Olkusz (depth 147.5 m), a — inner lateral view, $\times 55$; b — lower view, $\times 60$; 2 — Sosnowiec (depth 1815.7 m), a — inner lateral view, $\times 35$; b — upper view, $\times 35$; 6 — Sosnowiec (depth 1819 m), inner lateral view, $\times 60$
- 3—5 — *Mestognathus beckmanni* Bischoff; 3 — Sosnowiec (depth 1780 m), specimen transitional to *M. bipluti*, a — inner lateral view, $\times 35$; 4 — Sosnowiec (depth 1697.6 m), specimen transitional to *M. bipluti*, to show the posteriorly reduced platform, inner lateral view, $\times 30$; 5 — Sosnowiec (depth 1782.5 m), juvenile specimen, inner lateral view, $\times 90$
- 7—8 — *Mestognathus bipluti* Higgins; 7 — Rudno (depth 759 m), juvenile specimen, to show the germinal inner parapet, inner lateral view, $\times 70$; 8 — Podedwórze (depth 592 m), juvenile specimen, a — inner lateral view, $\times 90$; b — upper view, $\times 90$

which is elongated in younger specimens. When the adult specimens are compared it seems that there is also a tendency of reduction of the basal cavity from *M. groessensi* to *M. bipluti*, which is phylogenetic in nature. The former species has a large, asymmetric *Clydagnathus*-like cavity (Pl. 1, Figs 1—2), but *M. bipluti* has a basal pit (Pl. 1, Fig. 7) located anteriorly to the middle of the unit, rather than a cavity.

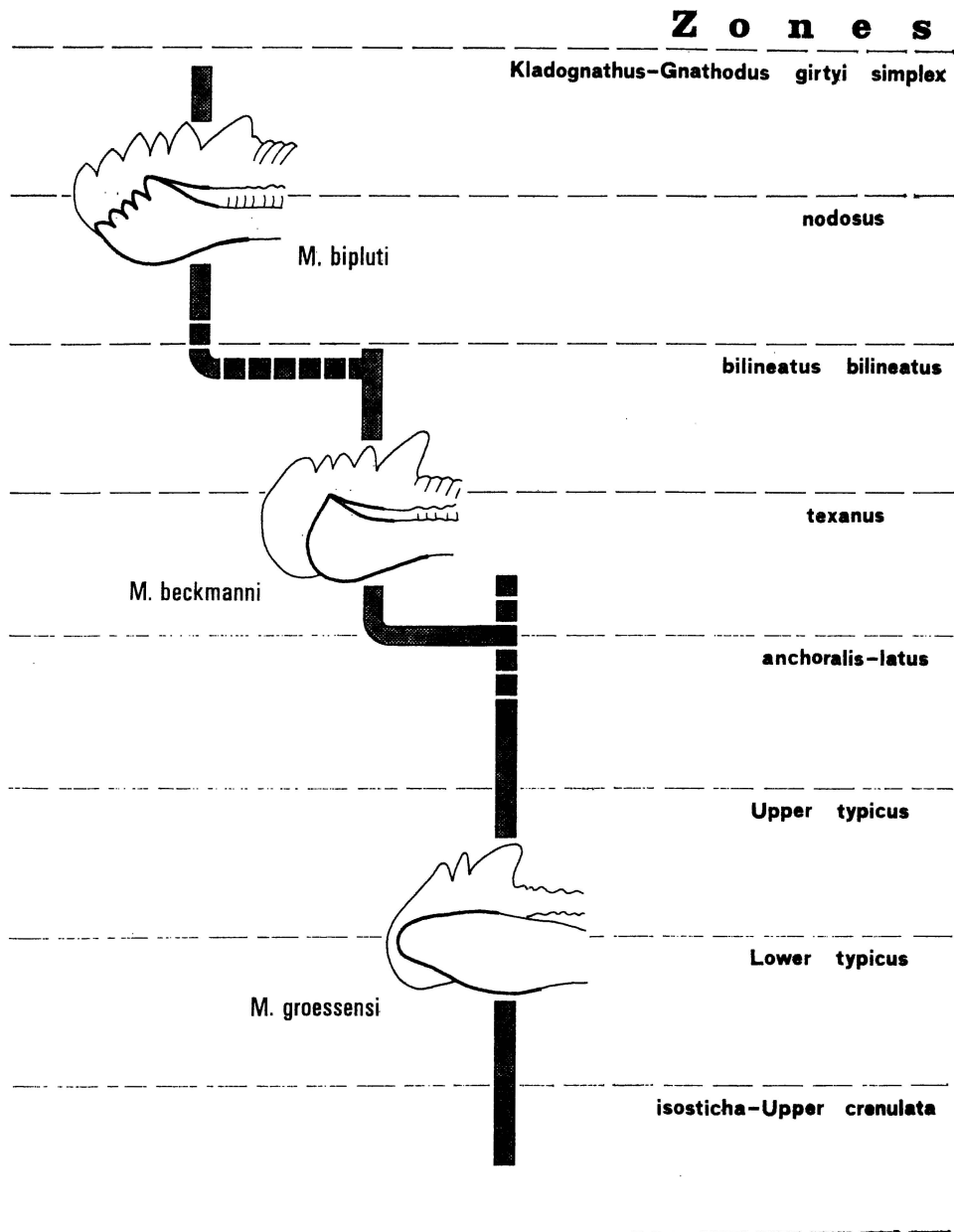


Fig. 3. Phyletic lineage of the *Mestognathus* species

ECOLOGICAL REMARKS

The data on the distribution of *Mestognathus* show that this typically shelf genus (Austin 1976) has been recorded in facies ranging from intertidal (von Bitter 1976) through sublittoral (Austin 1976) to basinal deep-water ones (e.g. in the Cantabrian Mts; Higgins 1981). It seems however that wide distribution of *Mestognathus* in different depositional environments is due to syndepositional transport of soft sediments, the conodonts in which could be shifted from one place to another one. Attention to this process is drawn only in some paleoecological interpretations of Dinantian conodonts (e.g. Austin 1976, Sandberg & Gutschick 1979).

Generally, any reconstruction of the conodont ecology mainly consists in the recording of the dependence of conodont distribution upon lithology and facies. The knowledge of the origin of many deposits only occasionally allow to recognize the depth, salinity, water energy and other factors. Consequently, these parameters are used to determine the biofacies requirements of conodont genera or species. The analysis of the type "conodont → sediment → environment → conodont" takes no account on sediment transport in many environments, resulting from the wave-energy, tidal and bottom currents, and turbidity flows. As a consequence, the conodont dispersion in sediments of different environments, first of all these of the shelf, is much greater than the real ecological restriction of particular conodonts. The conodont elements underwent a posthumous transport (that is here beside the point of the redeposition of conodonts within extraclasts originated by reworking of a substrate that has already been lithified to produce mixed faunas) particularly intensive on the shelf margin and upper foreslope, where the detrital material was removed by the erosive capacity of turbidity currents and then transported as a basinward flow. Thus, it is important for interpretation of conodont paleoecology to treat differently all cases of the conodont co-occurring with allochthonous detrital material, for instance, in allodapic limestones connected with the Carboniferous Limestone platforms (cf. Franke, Eder & Engel 1975).

The *Mestognathus* occurrences in Poland reflect a wide range of its environmental distribution. This genus is present, but infrequently in nearshore littoral facies of the Lublin Coal Basin (Skompski & Soboń-Podgórska 1980) and of the Cracow Upland (Gromczakiewicz-Łomnicka 1974). More frequently, *Mestognathus* appears in bioclastic and oolitic grainstones or packstones deposited on the shelf margin of the Olkusz area (Polish Jura). The basinal spiculites with bioclastic grainstone beds, recorded in the borehole "Sosnowiec IG-1" contain *Mestognathus* associated by such genera as *Pseudopolygnathus*, *Gnathodus*, *Eotaphrus* and *Scaliognathus*. The last one, *Scaliognathus*, is interpreted to have lived in deep-water biofacies (Austin 1976), but it can also extend onto

the carbonates platforms (Lane, Sandberg & Ziegler 1980). Because of an environmentally mixed content of conodont fauna and of the allodapic nature of sediments, the *Mestognathus* setting recognized in the borehole Sosnowiec is interpreted as a result of seaward transported debris-flow. The interpretation of the restricted paleoenvironment of the *Mestognathus* only to the shelf area follows Higgins' suggestions (1981) that this genus was nektobenthic. The distribution of *Mestognathus* in the Carboniferous Limestone of Poland shows in any way that it was controlled more by the water-energy than by the conditions prevailing on the sea floor (cf. also von Bitter 1976), and thus its habitat could have been nektic.

To compare with the model of conodont biofacies presented by Sandberg & Gutschick (1979), adopted later to the European settings of Upper Tournaisian and Lower Viséan age (Lane, Sandberg & Ziegler 1980), the investigated *Mestognathus* occurrences correspond to the "Eotaphrus biofacies".

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Z. BEŁKA

EWOLUCJA KONODONTÓW Z DOLNOKARBOŃSKIEGO RODZAJU *MESTOGNATHUS*

(Streszczenie)

Przedmiotem pracy jest ewolucja i taksonomia konodontowego rodzaju *Mestognathus*. Rodzaj ten, reprezentowany jedynie przez dwa gatunki, *M. beckmanni* Bischoff, 1957, oraz *M. bipluti* Higgins, 1961, znany jest powszechnie z osadów wizenu i najniższego namuru Europy, Afryki i Australii (por. Higgins 1981). Jego gatunek typowy, *Mestognathus beckmanni*, pojawiający się w profilach belgijskich dokładnie na granicy turneju z wizenem, stanowi takson wskaźnikowy dla dolnego wizenu (Groessens 1974).

W profilach wapienia węglowego regionu śląsko-krakowskiego stwierdzono obecność nieznaną formę rodzaju *Mestognathus* pojawiającej się już od środkowego turneju (w poziomie *isosticha*-Upper *crenulata* sensu Sandberg & al. 1978). Formę tę opisano jako gatunek nowy, *M. groessensi* sp.n. W obrębie rodzaju *Mestognathus* jest on najbardziej prymitywny i wykazuje szereg cech wspólnych z gatunkami rodzaju *Clydagnathus*. W oparciu o różnice morfologiczne pomiędzy *M. groessensi*, *M. beckmanni* i *M. bipluti* oraz ich ontogenezę pokazano, że w filogenezie rodzaju *Mestognathus* progresywnej ewolucji ulegają tylko dwa elementy platformy, a mianowicie parapet wewnętrzny oraz karina. Elementom tym nadano znaczenie diagnostycznych cech gatunkowych w zrewidowanej taksonomii rodzaju. Wysłunięto przypuszczenie, że rodzaj *Mestognathus* był ekologicznie ograniczony jedynie do obszaru szelfu (od jego krawędzi do strefy międzypyłkowej), zaś rzadkie wystąpienia tych konodontów w osadach basenowych są efektem synsedymencyjnej redepozycji.
