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ADDITIONAL OBSERVATIONS ON THE JURASSIC BELEMNOIDS OF POLAND

Abstract. — Four species of belemnoids, one new: *Belemnopsis wiekensis* n. sp. from the Middle Jurassic and from lower horizons of the Upper Jurassic of Poland, belonging to the subfamily Belemnopsinae Naef, 1922, are described together with observations on the ontogeny, variability and structure of rostra.

INTRODUCTION

As a follow-up to the monograph of the belemnoids from the Jurassic of Poland (Pugaczewska, 1961), a description is given in the present paper of the four Jurassic species, including one new. This elaboration results from a comparative investigation of the Jurassic belemnoids of Poland and those pertaining to the scientific centres in Paris and Lyon where, in 1961-1962, the author stayed 4 months thanks to a grant of the French Government.

The material described comes from the Bathonian and the Lower Oxfordian of the Kraków-Częstochowa Jurassic and it was collected between 1954 and 1958 together with that, described in the monograph, mentioned above.

The present work has been prepared at the Chair of Palaeozoology of the Warsaw University. My warmest thanks are conveyed to Professor R. Kozłowski and to Professor Z. Kielan-Jaworowska for reading the manuscript and valuable critical remarks. The author is also indebted to Miss M. Czarnocka for taking the photographs.

The material described is part of the collections of the Warsaw University Palaeontological Institute for which the abbreviation, Z. Pal. UW is used.

DESCRIPTIONS

Subfamily **Belemnopsinae** Naef, 1922
Genus *Belemnopsis* Bayle, 1878
Belemnopsis wiekensis n.sp.
(Pl. I, Figs. 1-3)

1902. *Belemnites (Hibolites) latesulcatus* d'Orbigny; P. de Loriol, Etude sur les Mollusques et Brachiopodes, p. 8, Pl. I, Figs. 8-11.

Holotypus: A rostrum, Pl. I, Figs. 3 *a-b;* Z. Pal. UW No. Bj. 889.
Stratum typicum: Lower horizons of the Upper Jurassic, the Oxfordian marls.
Locus typicus: Ogrodzieniec (Zawiercie district), „Wiek" quarry.
Derivatio nominis: *wiekensis* — after the type locality „Wiek" quarry near Ogrodzieniec.

Diagnosis. — Rostra small, cylindrical, dorso-ventrally flattened, slightly eccentric in their distal part; ventral furrow up to 4 mm. wide, sometimes with a variable trace; lateral lines double; dorsal and ventral walls slightly convex; alveolar and apical parts unknown.

Material. — Three incomplete rostra with a smooth and lustrous surface.

Description. — External structure (Pl. I, Figs. 1-3). Cylindrical, medium-sized rostra. The fragments preserved are 10 to 30 mm. long. The dorso-ventral flattening, insignificant in the proximal part of a rostrum, increases in the distal part. Ventral furrow reaches 3—4 mm. in width which, with insignificant dimensions of the rostrum (5-7 mm. thick and 6-8 mm. wide), is an exceptional phenomenon among the Jurassic belemnoids from Poland. The course of this furrow vary as it may be shifted towards one of the side walls, the edge, limiting it on this side, becomes sharper and the furrow itself deeper, while the opposite edge is rounded and the furrow very shallow. Lateral lines (sometimes double) run along the side walls.

Dimensions (in mm.):

Z. Pal. U. W. No. Bj.	Max. d-v Ø	Max. d-s Ø
889	7.0	8.0
890	4.5	6.0
891	5.0	6.0

Due to the scarcity of material, investigations of the internal structure of rostra, of their ontogeny and variability could not be done.

Remarks. — The specimens, described here, are in conformity with those from France, described by Loriol (1902, p. 8, Pl. I, Figs. 8-11) who,

however, erroneously assigned them to *Belemnites (Hibolites) latesulcatus* d'Orbigny. The holotype and the paratypes of *Belemnopsis latesulcatus* d'Orbigny fully correspond to the specimens of *B. latesulcatus* d'Orbigny from Poland (Pugaczewska, 1961, p. 150, Plates XI and XII), but they considerably differ from those, attributed to this species by Loriol. The Loriol's specimens of *B. latesulcatus* d'Orbigny together with specimens from Poland are assigned here to *Belemnopsis wiekensis* n.sp.

B. wiekensis n.sp. differs from *B. latesulcatus* d'Orbigny in its considerably smaller dimensions, wider and shallower ventral furrow, more rounded cross section, double lateral lines and in an eccentricity of the distal part of the rostrum.

Occurrence. — *Belemnopsis wiekensis* n.sp. is known in France from the Argovien II horizon and from layers, containing *Pholadomya exaltata,* in a few localities of the Jura lédonien area. In Poland, it occurs in the Oxfordian marls in the „Wiek" quarry near Ogrodzieniec (Zawiercie district).

Belemnopsis bessinus (d'Orbigny, 1842)
(Pl. I, Figs. 4-8)

1842. *Belemnites bessinus* n.sp.; A. d'Orbigny, Paléontologie française. Terrains jurassiques, p. 110, Pl. I, Figs. 7-13.
1878. *Belemnopsis bessina* d'Orbigny; E. Bayle, Explication de la Carte..., Atlas, I-e partie, Pl. 30, Fig. 1.
1920. *Belemnopsis bessina* d'Orbigny; E. von Bülow-Trummer, Fossilium Catalogus, p. 126.
1922. *Belemnopsis bessinus* d'Orbigny; A. Naef, Die fossilen Tintenfische, p. 247, Text-fig. 89e.
1925. *Belemnopsis bessinus* d'Orbigny; M. Lissajous, Répertoire alphabétique..., p. 34, Text-fig. 19.

Material. — Five almost complete rostra of different individual ages and many fragments. Preservation good, surface smooth. Phragmocones absent.

Description. — External structure (Pl. I, Figs. 4-8). Rostra cylindrical, slender, strongly elongated, with a long, sharply pointed distal part. Rostra of young individuals are fusiform. Length of rostra varies between 52 and 150 mm., the longest lateral diameters amounting respectively to 4.5-14 mm. and dorso-ventral diameters — 4-10 mm. Rostra are dorso-ventrally flattened over the entire length and considerably less so in their alveolar part. Lateral lines, more distinct in the rostra of young individuals, run along the side walls. A broad (to 4 mm.) furrow, narrower and deeper in the alveolar part of the rostrum, bordered by sharp rims, extending and becoming ever shallower in the medial part of the rostrum, runs along the ventral wall. It disappears in the distal part of the rostrum or, sometimes, is visible in the form of a narrow slit.

The cross section of the rostrum is reniform with its lateral diameter longer. The alveole fills about $^2/_5$ of the length of the rostrum. The alveolar angle amounts to 22-24°.

Dimensions (in mm.):

Z. Pal. U. W. No. Bj.	Max. d-v Ø	Max. d-s Ø	Rostrum length	Flattening index
289	4.0	4.5	52	1.12
277	5.0	6.0	65	1.20
282a	7.3	9.3	95	1.27
283	7.6	10.0	100	1.31
283a	10.0	14.0	150	1.40

The thickness (d-v ϕ), width (d-s ϕ) and index of flattening increase together with the size of individuals.

Internal structure. Numerous fine lines of growth, more distinct in certain phases of the growth, are visible in thin longitudinal and transverse sections. The apical line, slightly eccentric, approaches the ventral side of the rostrum.

Ontogeny. — The youngest growth stages are fusiform. With the growth of an individual, this shape gradually becomes cylindrical. During the growth, the distal section becomes ever more slender, tapering and sharply pointed. The ventral furrow, narrow in young individuals, considerably extends in older growth stages. Lateral lines, distinct in young individuals, usually disappear in adult. Cross sections, round in young individuals, change into oval in older and into reniform, with longer lateral diameter, in adult specimens.

Variability. — The small variability of the adult individuals of *Belemnopsis bessinus* (d'Orbigny) is mostly shown by a degree of sharpening and elongation of the distal section, as well as by certain changes in the width and length of the ventral furrow.

Remarks. — The specimens, described from Poland, are identical with those, attributed to this species in the Puzos' collection at Ecole des Mines, in Curet's collection at the Sorbonne, with the types of d'Orbigny at Musée d'Histoire Naturelle in Paris, as well as with the specimens of Lissajous collection at the Institut de Géologie in Lyon.

The validity of this species was questioned by Roman (in Lissajous, 1925, pp. 34, 58) who considered it is only an adult stage of *Belemnopsis fusiformis* (Parkinson). The comparison of these species has shown the present writer that they are not identical. Their similarity concerns an approximately identical shape of rostra in young individuals. However, *Belemnopsis bessinus* (d'Orbigny) differs from *B. fusiformis* (Parkinson) in numerous characters of the internal and external structure of rostra,

in having a broad and deep ventral furrow, in a sharp, strongly elongated distal part and in a cylindrical shape of the rostra of adult individuals.

Occurrence. — *Belemnopsis bessinus* (d'Orbigny) is known from numerous Bajocian and Bathonian outcroppings in France, Germany, Switzerland and the USSR. In Poland, it occurs in the Bathonian clays of Trzebionka (Chrzanów district).

Belemnopsis apiciconus (Blainville, 1827)
(Pl. II, Figs. 1-6)

1827. *Belemnites apiciconus* n.sp.; D. Blainville, Mémoire sur les Bélemnites, p. 69, Pl. 2, Fig. 2.
1827. *Belemnites acutus* Miller; D. Blainville, *Ibid.*, pp. 69-71, Pl. 2, Fig. 3.
1846—1849. *Belemnites canaliculatus* Schlotheim; F. A. Quenstedt, Petrefactenkunde..., p. 439, Pl. 29, Fig. 6.
1850—1860. *Belemnites sulcatus* Miller; A. d'Orbigny, Paléontologie française, p. 105, Pl. 12, Figs. 1-8 (except Fig. 4).
1858. *Belemnites canaliculatus* Schlotheim; F. A. Quenstedt, Der Jura, p. 411, Pl. 56, Fig. 6.
1868. *Belemnites apiciconus* Blainville; J. Phillips, Liassic and Oolitic Belemnites, pp. 101-102, Pl. 25, Fig. 58.
1869. *Belemnites canaliculatus* Schlotheim; J. Phillips, British Belemnitidae, p. 103, Pl. 25, Figs. 61 „V", „S", „s".
1911. *Belemnites apiciconus* Blainville; M. Lissajous, Jurassiques mâconnais, p. 14, Pl. 2, Fig. 6.
1920. *Belemnopsis sulcatus* Miller; E. von Bülow-Trummer, Fossilium Catalogus, p. 131.
1925. *Belemnopsis apiciconus* Blainville; M. Lissajous, Répertoire alphabétique..., p. 54.

Material. — Sixteen rostra with partially preserved alveoles and many fragments, in a good state of preservation.

Description. — External structure (Pl. II, Figs. 2 *a-b* to 6 *a-b*). Rostra are ventrally cylindrical and laterally conical. Their length varies between 47 and 86 mm. The largest width — at a distance of about $^1/_3$ of their length from the end — amounts, in measured specimens, to 6-15 mm., while the thickness, in the same place, to 5-12 mm. Ventral furrow long, sometimes reaching the end of the rostrum, in the proximal part is usually narrow and deep, bordered by sharp edges. Towards the end, it becomes shallower and wider. Lateral lines lacking. In the proximal part, the cross section is rounded, in the distal, it changes into oval, with lateral diameter longer. The depth of alveole is equal to $^1/_3$ of the length of the rostrum, its angle amounts to 19—22°.

Dimensions are given in Table 1.

The index of growth is inversely proportional to the age of individuals, decreasing from 4.3 to 2.6. This correlation shows that the rostra of young individuals are more elongated, with a slender distal section,

Table 1

Dimensions of rostra of *Belemnopsis apiciconus* (in mm.)

Z. Pal. U. W. No. Bj.	Max. d-s Ø	d-v Ø in this place	Length of distal part	Growth index
	a	b	c	c : a
856	6.0	5 0	26.0	4,3
857	6.6	5.5	27.0	4.1
858	8.0	6.5	34.0	4.2
859	8.2	6.5	34.0	4.2
860	9.5	7.0	30,0	3.1
861	9.7	7.3	30.0	3.0
862	10.0	7.5	34.0	3.4
863	9.5	7.6	34.0	3.4
864	11.0	8.0	37.0	3.3
865	11.0	8.0	35.0	2.9
866	12.0	10.0	44.0	3.5
867	13.0	10.0	44.0	3.4
868	13.0	10.5	50.0	3.5
869	13.0	11.0	41.0	3.1
870	15.0	12,0	40.0	2.6

while in older individuals they become thicker and their distal end becomes shorter and thicker.

Internal structure (Pl. II, Figs. 1 *a-b*, 6 *a-e*). Fine lines of growth, visible on thin transverse and longitudinal sections, are, at certain intervals, marked more distinctly which probably is a result of successive stages of the growth of a rostrum. A recess of the line of growth which can be observed in transverse sections in a place where the ventral furrow is situated, is distinctly marked only in the vicinity of the alveoles. In the medial part of the rostrum it becomes considerably shallower and, in the distal part, completely disappears. The younger growth stages, visible in the cross section in the medial part of the rostrum, are round in outline, while the older ones, as marked by peripheral lines of growth, are reniform in the distal part of the rostrum and rounded in the proximal part. The apical line, somewhat eccentric, approaches the ventral side of the rostrum. An incomplete phragmocone consists of a large embryonic chamber 0.5 mm. in diameter and 18 air chambers, the last of them only 0.45 mm. high (Pl. II, Fig. 1*b*).

Ontogeny. — With the growth of an individual, the rostrum increases in length, thickness and width. Certain characters of the rostrum, such as, the elongation of the distal section, the depth and width of the ventral furrow and dorso-ventral flattening are subject to changes, depen-

ding on individual age. On the basis of these changes, the nepionic, neanic and ephebic-gerontic stages can be distinguished.

Dimensions are given in Table 2.

Table 2

Characteristics of the ontogeny of *Belemnopsis apiciconus*

Growth stages	Max. diameter d-s mm.	Max. diameter d-v mm.	Growth index	Rostrum
Nepionic	6.0-9.5	5.0-9.0	4.3-3 1	Elongated, slender; the increase in length greater than the increase in thickness and width; distal part long; max. d-s diameter halfway the length of the rostrum; ventral furrow narrow, very deep, not reaching the end of the rostrum; lateral lines lacking; transverse section, rounded in the proximal part, becomes oval and with longer lateral diameter in the medial part.
Néanic	9.6-11.0	7.1-8.0	3.0-2.9	Elongated; increase in length somewhat smaller than in the former stage; distal section shorter; max. d-s diameter shifted towards the end; ventral furrow wider, deep, with sharp edges; lateral lines lacking; cross section more flattened in the medial and distal parts of the rostrum.
Ephebic-gerontic	11.1-15.0	8.1-12.0	2.8-2.6	Thick; thickness and width increase proportional to the elongation; distal part shorter; longest d-s diameter at 1/3 of the length from the end of the rostrum; ventral furrow wide, shallower; lateral lines lacking; cross section unchanged.

The embryonic stage, visible only in thin sections, is elongated and with a round cross section.

Variability. — The degree of variability of the rostra of the same individual age is low and manifested in a non-uniform increase in length, width and thickness, in certain differences in the length and width of the ventral furrow, in different elongations of the distal part and in the shape of its end which can be pointed, round, or mucronate.

Remarks. — *Belemnopsis apiciconus* (Blainville) resembles, in a similarly developed ventral furrow, *B. canaliculatus* (Schlotheim), as well as *B. latesulcatus* (d'Orbigny). It differs from them in a conical shape of the rostrum (lateral view), lesser dorso-ventral flattening, lack of

lateral lines and different proportions of the length to the width and thickness.

Occurrence. — *Belemnopsis apiciconus* (Blainville) is known from the Bajocian and the Bathonian of Great Britain, France, Spain and the Island of Madagascar. In Poland, it occurs in the same horizons at Trzebionka (Chrzanów district), Kamienica Polska and Rudnik (Zawiercie district).

Genus *Hibolites* Mayer, 1883
Hibolites pressulus (Quenstedt, 1858)
(Pl. I, Figs. 9-14)

1858. *Belemnites pressulus* n.sp.; F. A. Quenstedt, Der Jura, p. 579, Pl. 73, Figs. 22-27.
1900. *Hibolites pressulus* Quenstedt; P. de Loriol, Jura lédonien..., p. 9. Pl. 2, Figs. 5-9 (except Fig. 8).
1902. *Belemnites (Hibolites) pressulus* Quenstedt; P. de Loriol, Étude sur les Mollusques..., p. 13.
1910. *Belemnites pressulus* Quenstedt; E. Fraas, Der Petrefaktensammler, p. 182, Pl. 55, Figs. 10—11.
1911. *Belemnites (Hibolites) pressulus* Quenstedt; M. Lissajous, Jurassique mâconnais..., p. 15, Pl. 2, Figs. 9-10.
1920. *Hibolites pressulus* Quenstedt; E. v. Bülow-Trummer. Fossilium Catalogus, p. 150.
1925. *Belemnopsis pressulus* Quenstedt; M. Lissajous, Répertoire alphabétique..., p. 123.

Material. — Twelve rostra of different individual age. Phragmocones and alveoles not preserved.

Description. — External structure (Pl. I, Figs. 10 *a-b* to 14 *a-b*). Rostra club-like in shape with an elongated proximal part. The length of rostra varies between 10 and 25 mm. The longest diameter, at $^1/_4$ of the length from the end, amounts to 2-7 mm. Distal end short, often mucronate, sometimes asymmetrical. Distinct lateral lines, reaching the end, run along the side walls. A very short ventral furrow is visible on one specimen. Cross section rounded or square in the proximal part of the rostrum, round in the distal part.

Dimensions are given in Table 3 .

During the ontogeny, the growth index is non-uniform. At first, it increases from 2.2 to 2.5 and, afterwards, decreases to 1.6. This is undoubtedly related with a considerable variability of shape and proportion of particular growth stages of the specimens of this species.

Internal structure (Pl. I, Fig. 9). Numerous fine growth lines, at certain intervals more strongly marked, are visible in thin sections. At the level of lateral lines, the growth lines are slightly deeper. The apical line is arranged along the rostrum axis. In the specimens with asymmetrically deflected distal cross section, this line approaches the ventral side of the rostrum.

Table 3

Dimensions of rostra of *Hibolites pressulus* (in mm.)

Z. Pal. U W. No. Bj.	Max. d-s Ø	Max. d-v Ø	Length of distal part	Growth index
	a	b	c	c : a
873	2.0	2.1	4.5	2.2
874	2.2	2.2	5.0	2.3
875	2.5	2.6	6.0	2.4
876	3.0	3.0	7.6	2.5
877	3.4	3.3	6.7	2.0
878	3.4	3.2	6.0	1.8
889	3.9	3.5	9.5	2.4
880	3.8	4.0	9.0	2.3
881	4.3	4.1	9.3	2.1
882	4.5	3.6	7.6	1.7
883	5.0	4.8	9.5	1.9
884	7.0	6.5	11.5	1.6

Table 4

Characteristics of the ontogeny of *Hibolites pressulus*

Growth stages	Max. diameter		Growth index	Rostrum
	d-s mm.	d-v mm.		
Nepionic	2.0—2.5	2.1—2.6	2.2—2.4	Elongated, slender, with long proximal part; longest d-s diameters are at 1/3 of the length from the end; distal section elongated, sharply pointed; distinct, double lateral lines; cross section round or rounded.
Neanic	2.6—4.5	2.7—4.1	2.5—1.8	Less slender; longest d-s diameters are at 1/4 of the length from the end distal part shorter, thick; the tip of the rostrum mucronate in several specimens; distinct, double lateral lines; cross section oval or subsquare.
Ephebic-gerontic	4.6—7.0	4.2—6.5	1.9—1.6	Thick; largest diameters are more shifted posteriorly; distal part short, thick, often terminating in a mucro; cross section square; lateral lines distinct.

Ontogeny. — With the growth, the shape of rostrum changes. The rostra of young individuals are more elongated, slender, with small increase in thickness and width. The older growth stages are distinguished by a more uniform growth, their rostra become ever thicker in their distal part and even take a mace-like shape. The distal part shortens, the longest diameters of the rostrum shifting posteriorly. On the basis of these changes, the three main growth stages, nepionic, neanic and ephebic-gerontic can be distinguished in *Hibolites pressulus*.

Dimensions are given in Table 4.

Variability. — The rostra of adult *H. pressulus* are distinguished by an exceptionally great variability in a larger or smaller elongation of the proximal part, in sharpening or rounding of the tip, in a non-uniform increase in thickness, width and length, as well as in the outline of the cross section.

Remarks. — Quenstedt (1858, p. 579) points out the similarity of *Hibolites pressulus* to the rostra of the young *H. hastatus*. It seems, however, that these species are not similar. Though the specimens of *H. pressulus* with a symmetrical structure and strongly elongated proximal part resemble young specimens of *H. hastatus* in their fusiform shape. In all the other characters as, a club-like form of adult individuals, a mucronate tip, an absence of ventral furrow, or its only insignificant length, a round to square transverse section and very small dimensions of rostra, *H. pressulus* is considerably different from *H. hastatus*.

In French collections, *H. pressulus* is represented by specimens, marked by all characters, distinguished in those of the Polish material.

Occurrence. — *Hibolites pressulus* is known from the Lower Oxfordian of Switzerland, France and Germany. In Poland, it occurs in the same horizon at Racławice (Krzeszowice district).

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HALINA PUGACZEWSKA

DODATKOWE BADANIA NAD BELEMNITAMI JURAJSKIMI W POLSCE

Streszczenie

Opisano 4 gatunki belemnitów jurajskich, w tym 1 nowy, należące do podrodziny Belemnopsinae Naef, 1922. Stanowią one uzupełnienie do monografii belemnitów jurajskich Polski (Pugaczewska, 1961).

Materiał pochodzi z margli oksfordzkich kamieniołomu „Wiek" koło Ogrodzieńca (pow. Zawiercie), z iłów batońskich Trzebionki (pow. Chrzanów), Kamienicy Polskiej i Rudnika (pow. Zawiercie) oraz z dolnego oksfordu Racławic (pow. Krzeszowice).

Poniżej podana jest charakterystyka gatunku nowego.

Belemnopsis wiekensis n.sp.
(Pl. I, fig. 1-3)

Diagnoza. — Rostra cylindryczne, o długości 10-30 mm, spłaszczone dorsowentralnie, w części dystalnej nieco ekscentryczne; bruzda wentralna szeroka do 4 mm, o zmiennym przebiegu; linie boczne podwójne; ścianki dorsalna i wentralna wypukłe; część alweolarna i dystalna nie znane.

Uwagi. — *Belemnopsis wiekensis* n.sp. odpowiada pod względem struktury wewnętrznej i zewnętrznej okazom z Francji, opisanym przez Loriola (1902), lecz błędnie zaliczonym przez niego do gatunku *Belemnites (Hibolites) latesulcatus* d'Orbigny. Holotyp i paratypy *Belemnopsis latesulcatus* d'Orbigny różnią się od

gatunku, opisanego pod tą samą nazwą przez Loriola, licznymi cechami, m.in.: znacznie większą długością (do 120 mm), silniejszym spłaszczeniem dorso-wentralnym, pojedynczymi liniami bocznymi, a także występowaniem w niższych poziomach jury (baton, kelowej). Uważam więc za słuszne wyłączyć okazy opisane przez Loriola z gatunku *Belemnites latesulcatus* d'Orbigny i zaliczyć je razem z identycznymi okazami z Polski do nowego gatunku *Belemnopsis wiekensis* n.sp.

Występowanie. — Margle oksfordzkie kamieniołomu „Wiek" koło Ogrodzieńca (pow. Zawiercie).

ГАЛИНА ПУГАЧЕВСКА

ДОПОЛНИТЕЛЬНЫЕ ИССЛЕДОВАНИЯ ЮРСКИХ БЕЛЕМНИТОВ В ПОЛЬШЕ

Резюме

Описанные тут 4 вида юрских белемнитов, в этом 1 новый, принадлежащие к подсемейству Belemnopsinae Naef, 1922, составляют дополнение к монографии белемнитов из юры Польши (Pugaczewska, 1961).

Материал собран в оксфордских мергелях камнеломни „Век" близ Огродзеньца (повят Заверце), в батских илах около Тржебионки (п. Хржанув), Каменицы Польской и Рудника (п. Заверце) и в нижнем оксфорде Рацлавиц (пов. Кржешовице).

Ниже приведена характеристика нового вида.

Belemnopsis wiekensis n. sp.
(Пл. I, фиг. 1—3)

Диагноз. — Ростры цилиндрические, длины 10—30 мм, сплющенные в дорсо-вентральном направлении, в части дистальной немного эксцентрические; вентральная борозда ширины до 4 мм, изменчивой длины; боковые линии двойные; дорсальная и вентральная стенки выпуклые; альвеоларная и дистальная части не известны.

Замечания. — *B. wiekensis* n. sp. в отношении внутренней и внешней структуры соответствует образцам из Франции, которые описал Лориоль (Loriol, 1902), но неправильно причислил к виду *Belemnites (Hibolites) latesulcatus* d'Orbigny. Голотип и паратипы *Belemnopsis latesulcatus* d'Orbigny отличаются от формы, описанной Лориолом под таким же названием, многими чертами, между прочим:

значительно большей длиной (до 120 мм), дорсо-вентральной сплющенностью, единичными боковыми линиями, а также присутствием в более низких ярусах юры (бат, келловей). Формы описанные Лориолюм надо исключить из вида *B. latesulcatus* d'Orbigny и причислить их вместе с формами из Польши к новому виду *Belemnopsis wiekensis* n. sp.

Местонахождение. — Оксфордские мергели камнеломни „Век" близ Огродзеньца (пов. Заверце).

PLATES

Plate I

Belemnopsis wiekensis n.sp.

Fig. 1-3. Three rostra of different individual age: *a* ventral view, *b* side view; × 1.5 (Bj. 889, 890, 891); Oxfordian, Ogrodzieniec (Zawiercie district). Fig. 3 *a-b* Bj. 889 — holotype.

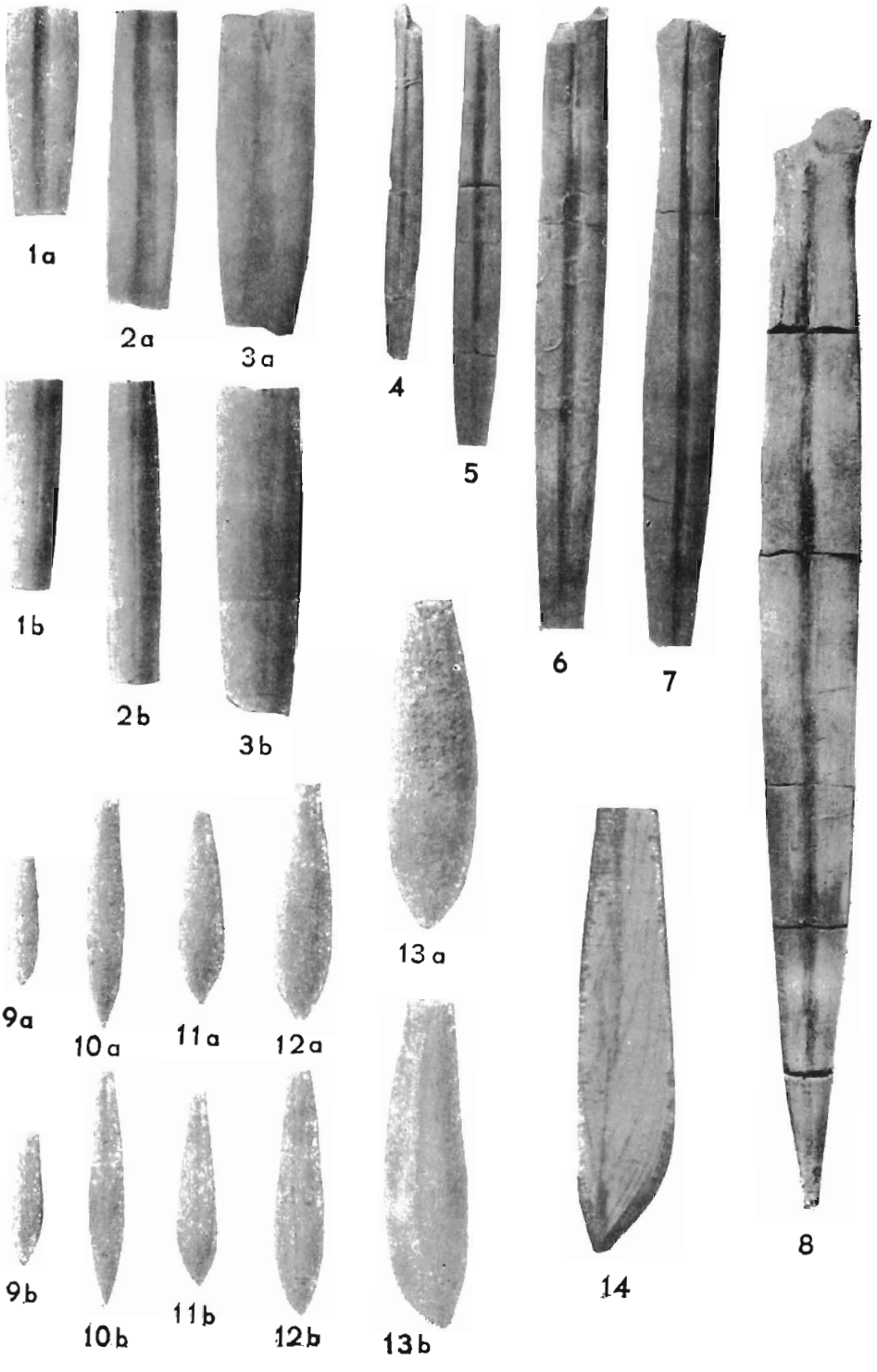
Belemnopsis bessinus (d'Orbigny)

Fig. 4-8. Five rostra of different individual age, ventral view; nat. size (Bj. 277a, 282a, 283a, 289, 888); Bathonian, Trzebionka (Chrzanów district).

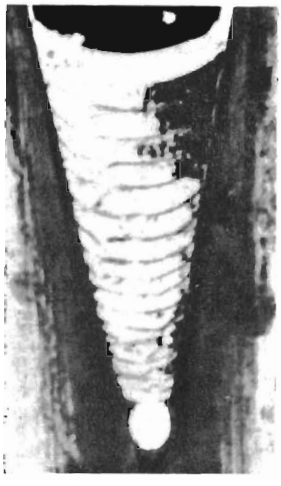
Hibolites pressulus (Quenstedt)

Fig. 9-13. Five rostra of different individual age: *a* ventral view, *b* side view; × 2 (Bj. 873, 876, 880, 881, 884); Lower Oxfordian, Racławice (Krzeszowice district).

Fig. 14. Longitudinal section in the plane of symmetry; × 3.7 (Bj. 886), Lower Oxfordian, Racławice (Krzeszowice district).



Phot. M. Czarnocka



1b

2a

3a

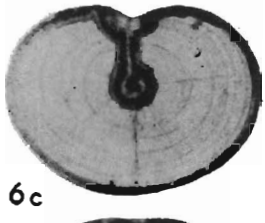
4a

5a

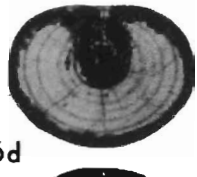
1a

6a

6b



6c



6d

6e

2b

3b

4b

5b

Phot. M. Czarnocka

Plate II

Belemnopsis apiciconus (Blainville)

Fig. 1. Longitudinal section of rostrum: *a* adult rostrum in the plane of symmetry, × 2; *b* phragmocone with protoconch and air chambers, × 13 (Bj. 872); Bathonian, Trzebionka (Chrzanów district).

Fig. 2-5. Four rostra of different individual age: *a* ventral view, *b* side view, nat. size (Bj.: 859, 864, 869, 870); Bathonian, Trzebionka (Chrzanów district).

Fig. 6 *a-c*. Five transverse sections in various parts of rostrum, from the alveolus to the apex; × 4.5 (Bj. 871): Bathonian, Trzebionka (Chrzanów district).