BULLETIN DE L'ACADÉMIE
POLONAISE DES SCIENCES
Série des sciences de la terre
Volume XXVIII, No. 4, 1980
Publié en jouillet 1981

GEOLOGY

Early Oxfordian Perisphinctids of the Częstochowa Area; Their Stratigraphic Value

by

Wojciech BROCHWICZ-LEWIŃSKI

Presented by W. POŻARYSKI on June 6, 1980

Summary. In the Lower and lower Middle Oxfordian sections of Wrzosowa and other localities in the Polish Jura Chain, two principal perisphinctid faunas can be recognized: the older one is dominated by *Prososphinctes claromontanus* (Bukowski) and its allies, and the younger by *Perisphinctes (Otosphinctes) paturattensis* de Loriol. Comparison of the stratigraphic ranges of perisphinctid and cardioceratid assemblages gives support to the differentiation of the Episcopalis Zone in the lowermost Middle Oxfordian by I. G. Sapunov and it suggests the possibility to differentiate the Claromontanus Zone (an equivalent of the cardioceratid Bukowskii Zone or Subzone of the Cordatum Zone). *Perisphinctes bernensis* Arkell (non de Loriol), *Prososphinctes sequeirosi* sp. n. and some other species of marked stratigraphic value are described and/or figured.

A large collection of ammonites was gathered in the course of studies on Lower and Middle Oxfordian sections at Wrzosowa and other localities in the Częstochowa area. Special attention should be paid to perisphinctids, fairly common and well-preserved in these strata, especially in the Wrzosowa section [11]. The studies on the perisphinctid fauna are still in progress, but some of the results obtained so far are worth presenting as the perisphinctids appear to be of value both for the stratigraphy and for a reconstruction of the evolution of that group.

Perisphinctid succession in the Wrzosowa section. The best section of the Lower and lowermost Middle Oxfordian in the Częstochowa area is that from the Wrzosowa hill, in the SW outskirts of Częstochowa. The section was studied by Siemiradzki [18] and later by Różycki [15], who assigned the strata cropping there to the Qu. praecordatum (?), Asp. babeanum, Asp. faustum and Asp. perarmatum zones of the Neuvisian. Subsequently, the strata cropping out at Wrzosowa and Kłobuck were analysed by Malinowska [11], who followed Różycki's suggestion ([15], p. 9)

that as the most appropriate guide fossils for the Neuvisian cardioceratids should be taken as the basis for the subdivision of that stage. Malinowska [11] proposed such a subdivision, assigning the strata in question to the Bukowskii and Excavatum zones. In correlating the subdivision with those used for Submediterranean, NW-European (Subboreal pars) and Boreal regions, French and English authors treated her Bukowski Zone as an equivalent of the Bukowskii Subzone of the Cordatum. Zone and the Excavatum as an equivalent of the Vertebrale or Tenuicostatum Subzone of the Plicatilis Zone ([8] and others). Further studies on that section [19] confirmed the validity of the above correlations. The studies, based mainly on cardioceratids, showed that the strata referrable to the Excavatum zone and, at the same time, the Vertebrale subzone of the Plicatilis zone, are directly overlaying those of the Bukowskii Zone sensu [11] or the Bukowskii Subzone of the Cordatum Zone. It follows that we are dealing here with a stratigraphic gap corresponding to the two higher subzones of the Cordatum Zone (Costicardia and Cordatum subzones) in the Submediterranean, NW-European and Boreal zonal schemes.

In the further course of the analysis it was noted that the differences between perisphinctid assemblages are also fairly large, suggesting that the perisphinctid fauna may be also useful in establishing a zonation of these strata after an appropriate correlation with the *Cardioceras* subdivision.

In the Oxfordian section of Wrzosowa, two principal perisphinctid faunas can be recognized: the older one is dominated by *Prososphinctes claromontanus* (Bukowski) and its allies of the genus *Prososphinctes* Schindewolf, 1925 (the range of which comprises the Bukowskii Zone sensu Malinowska [11] and the Bukowskii Subzone of the Cordatum Zone in Submediterranean, NW-European and Boreal subdivision), while the younger by *Perisphinctes (Otosphinctes) paturattensis* de Loriol, the range of which comprises the Excavatum Zone of Malinowska [11] and thus the Vertebrale or Tenuicostatum Subzone of the Plicatilis Zone in the above-mentioned subdivisions.

The older perisphinctid fauna. As mentioned above, the older fauna is characterized by the predominance of the representatives of *Prososphinctes claromontanus* (Bukowski) and other species of the genus *Prososphinctes* Schindewolf, 1925. *Prosphinctes claromontanus* (Buk.) appears to the most common in the lower part of the section (beds corresponding to Beds Nos 23–17 in [11], Fig. 2), becoming rare upwards. In the lower part of the section, representatives of this species are accompanied by those of *Prososphinctes mairei-matheyi* group, *P. consociatus* (Buk.), *P.* cf. *michalskii* (Buk.), *P. sequeirosi* sp. n. and several other representatives of this genus which cannot be accomodated in any available species. The representatives of the *P. mairei-matheyi* group soon disappear whereas those of the species *P. mazuricus* (Buk.) probably do not appear beneath

the layer corresponding to Bed No. 16 [11] continuing upwards to the base of the Excavatum Zone.

The *Prososphinctes claromontanus* fauna also comprises representatives of *Passendorferia (Passendorferia)* and *P. (Enayites) czenstochovensis* Siem. (see [5]) and forms which may be assigned to the genus *Kranaosphinctes* Buckman, 1921 (see [11, 4]). Special attention should be paid to the specimens referrable to *Perisphinctes bernensis* sensu Arkell (1944, non de Loriol, 1898). The specimens, markedly differing from the others assigned to that species in the past (see [11], p. 154–155), occur here in a stratigraphic position analogous to that in England (Bed No. 24 and close to it). It should be added here that, according to Arkell [1], "it would be reasonable to regard *P. bernensis* as the direct forerunner of *P. uatius* and so of at least the «Otosphinctes»". However, the record of several more or less complete representatives of *Perisphinctes (Otosphinctes)*, including *P. (O.)* cf. *moeschi* de Loriol offers a more plausible explanation of the derivation of the Middle Oxfordian representatives of this subgenus.

Besides the above-mentioned forms, numerous representatives of the genus *Mirosphinctes* Schindewolf, 1926, mostly of the species *M. mirus* (Buk.) and *M. frickensis* (Moesch) (see [11] p. 71) were found there.

The younger perisphinctid fauna. The younger fauna found in beds corresponding to Beds Nos 5–2 (in [11], Fig. 2) and dated at the Excavatum (= Vertebrale Subzone of the Plicatilis Zone) Zone on the basis of cardioceratids [14] comprises mainly representatives of *Perisphinctes (Otosphinctes) paturattensis* de Loriol, *P. (O.)* ex gr. *montfalconensis.* de Loriol, *P. (O.)* spp. including some close to *P. (Dichotomosphinctes)*, *P. (? Dichotomosphinctes)* sp., fragments of *Kranaosphinctes* including *K.* sp. ex gr. *promiscuus* (Buk.), and others. *Prososphinctes* seems to be missing here whereas *Mirosphinctes* is represented by large individuals (over 40 mm in size). The differences in relation to the older fauna area also connected with the predominant trend to very thick, markedly depressed whorls, especially the outer ones, and heavy ribbing.

Correlation with other sections. The older fauna may be easily correlated with those from Kłobuck I and II [11], Jaworznik [3] and the older fauna from Zalas [14] as well as the perisphinctid fauna with *Prososphinctes*, reported by Malinowska [20] and Matyja [13] from the margins of the Holy Cross Mts.

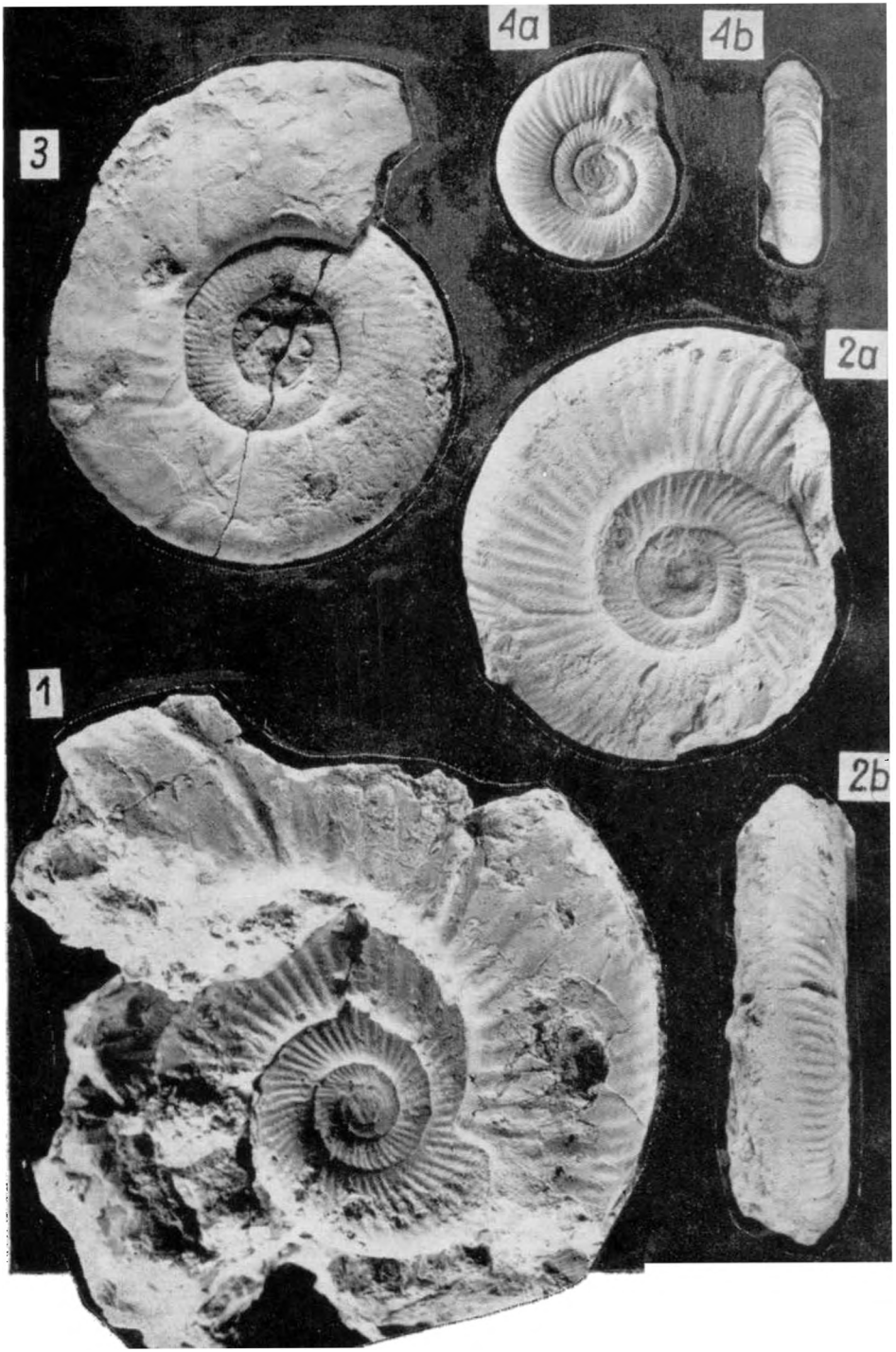
The younger fauna may be easily correlated only with that found in the Neuvisian of Prędziszów (see [3]), comprising *Perisphinctes (Otosphinctes)* cf. *paturattensis* de Loriol (figured in [5]) and other small-sized perisphinctids with thick, depressed outer whorls, and cardioceratids clearly indicative of the Excavatum Zone. The fauna appears somewhat older than that found above the Bukowskii Zone at Zalas and Ogrodzieniec as well as

the assemblage of the Vertebrale Subzone, Plicatilis Zone, described from SE France by Bourseau [2], most probably representing a higher horizon of that subzone (a similar conclusion was drawn by Marchand, pers. inf., on the basis of his analysis of the cardioceratids accompanying the compared perisphinctid faunas). Unfortunately, Bourseau's fauna was not unequivocally proven here; its presence may be inferred in the Zalas section where in some places the strata with *Prososphinctes* fauna are overlain with those of the Antecedens age and in others by somewhat older, yielding *Perisphinctes (Otosphinctes) laisinensis* de Loriol, *P. (O.) patturattensis* de Loriol and similar forms (see [14]). The record is much more complete in the case of the Antecedens fauna at Prędziszów, Jaworznik and some other localities [3] where it was possible to recognize two (*P. rotoides* and *P. buckmani*) horizons in the vertical section. The boundary beds of the Excavatum (or, as I previously termed it, the "Tenuicostatum") and the Antecedens zones are well characterized by *Kranaosphinctes promiscuus* (Buk.). Further analysis of that species showed that it may be more common and, at the same time, easier to identify than it was assumed [4]. The species is small (about 120–130 mm in size), with peristome displaying both lappets and rostrum (see Pl. 3: 1 a–b) and characterized by a highly specific change in ribbing at the body chamber—from the triplicate ribbing appearing close to the end of the penultimate whorl to the irregular biplicate in the middle of the body chamber. That feature, which is clearly displayed in the drawing of the lectotype ([6], pl. 29, fig. 1), has not been known from the remaining species of that genus.

On the possibilities to use the perisphinctid zonation. At present, the trend is to use regional subdivisions based on fauna actually present in the relevant sections. Such subdivisions are suggested instead of those originally proposed for the Subboreal province and "deeply entrenched in the literature, e.g. the zonal scheme given in the ammonite *Treatise*... [which] has perforce to be based on unconnected faunas from widely scattered localities in successions now known to be highly incomplete with major non-sequences. Moreover, the ammonites found are a mixture, not only of Subboreal elements indigenous to the province but also of the adjacent provinces which partly overlap: a mixture which changes rapidly in space and time" ([19], pp. 839 f). For these reasons attempts were made to carry out a zonation based on a single group of fossils,

PLATE I →

Prosophinctes consociatus (Buk.): 1—specimen No. 1514.II.12, Wrzosowa, Claromontanus Zone, D c. 100 mm, Ph 57–74 mm, at D 54 mm, H/D 0.35, U/D 0.43; 2—specimen No. 1514.II.41, Wrzosowa, waste, D 63 mm, Ph 57, H/D 0.34, U/D 0.41; *Prosophinctes* sp. *A*: 3—specimen No. 1514.II.18, Wrzosowa, Claromontanus Zone, D 73.5 mm, Ph 57 mm, H/D 0.38, U/D 0.37, at D 45, H/D 0.39, U/D 0.39; *Prosophinctes mairei-mathevi* group: 4—specimen No. 1514.II.45, Wrzosowa, Claromontanus Zone, D 30 mm, complete, lappeted, H/D 0.30, U/D 0.48, I/Dec. 0.27


4a
4b
3
2a
1
2b

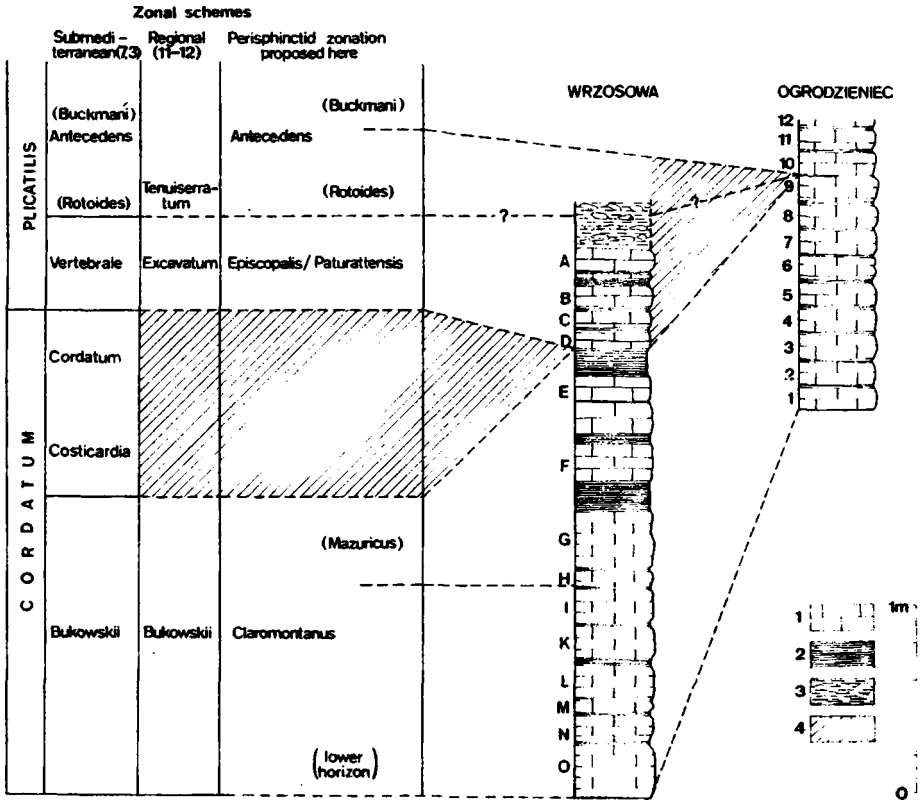
cardioceratids, for the more northerly areas. As noted by Sykes and Callomon ([19], p. 844), the first attempt at such a "systematic zonation based on this family is in Poland, where four Zones (Mariae, Bukowskii, Excavatum, and Tenuiserratum) span the Lower and Middle Oxfordian." Subsequently, the Amoeboceras zonation has been established for the remaining parts of the Oxfordian ([19, 12] and references cited therein).

For areas characterized by a large share or predominance of Mediterranean and Sub-Mediterranean fauna, attempts are being made to establish a zonal scheme based on perisphinctids for the Middle and Upper Oxfordian [8, 7, 3] and more recently for the lowermost Middle Oxfordian [16, 17]. In the latter case, the lack of cardioceratids (on which the zonation of the lowermost Middle and lower Oxfordian is traditionally based) in the relevant rocks of Bulgaria made it necessary to propose the Perisphinctes (Dichotomosphinctes) episcopalis, Creniceras renggeri and Peltomorphites athletoides zones, based on ammonites actually present in these rocks.

Notwithstanding the above gaps, the Wrzosowa section casts some light on the position and character of the ammonite assemblage of the Perisphinctes (Dichotomosphinctes) episcopalis Zone and it implies the possibility to extend the perisphinctid zonation downwards. At the same time, the rich *Cardioceras* fauna encountered here [11, 14] provides an efficient control and the possibility of a reliable correlation of *Cardioceras* and perisphinctid assemblages.

The younger perisphinctid assemblage may be easily correlated with that of Sapunov's Perisphinctes (Dichotomosphinctes) episcopalis Zone [16, 17]. Further studies should show whether *P. (O.) episcopalis* de Loriol is the most suitable index species for the zone roughly corresponding to the Vertebrale Subzone of the Plicatilis Zone (and, at the same time, the Excavatum Zone of L. Malinowska [11]) or *P. (Otosphinctes) paturattensis* would not be a better choice. At present, it would be desirable to treat that span as the Episcopalis/Paturattensis Zone. As mentioned above, certain differences in relevant fauna suggest two possible horizons in that zone: a higher one characterized by the fauna figured and described by Bourseau [2] and a lower one characterized by smaller species with broader and more depressed outer whorls as well as the presence of the ancestors of *P. (Dichotomosphinctes)* proper.

Because of the gap [14], nothing can be said about the perisphinctid equivalents of the higher parts of the Cordatum Zone here. In turn, the faunal record from older strata offers a possibility to propose the Claromontanus Zone as an equivalent of the Bukowskii Zone sensu Malinowska [11] or the Bukowskii Subzone in other zonal schemes. This Zone would be characterized by the nominal species and other species of the genus *Prososphinctes, Perisphinctes bernensis* sensu Arkell non de Loriol, *Perisphinctes (Otosphinctes)* cf. *moeschi* de Loriol and other early



Correlation of the Submediterranean, regional, and proposed perisphinctid subdivisions with reference to the Wrzosowa (NE part of the quarry) and Ogrodzieniec sections (see also [14])

1—limestones, 2—marls, 3—weathering cover, 4—inferred extent of stratigraphic gaps

P. (Otosphinctes). Here again two horizons appear possible: a lower one characterized by the *Prososphinctes mairei-matheyi* group, *P. claromontanus* and *P. sequeirosi* sp. n., and an upper one with *P. mazuricus* (Bukowski). *Prososphinctes consociatus* (Buk.) appears to be present in both horizons.

The character of older perisphinctid faunas will be better known when the strata of the Mariae-Lamberti age from the Wodna area [10] have been reanalysed. At present it may only be stated that, as in France, the *Prosphinctes mairei-matheyi* group is also present in the underlying zones (but its representatives display markedly less developed parabolic nodes) whereas *P. claromontanus* (Buk.) and other species of this genus do not appear in strata older than Beds Nos 24 or even 23 or the Wrzosowa section. Therefore, the base of the Claromontanus Zone would be tentatively defined by the first appearance of *P. claromontanus* (Buk.).

a fairly common species, and other medium-sized representatives of that genus.

The base of the Episcopalis/Paturattensis Zone would be defined by the first appearance of *Perisphinctes (Otosphinctes) paturattensis* de Loriol.

Further studies on these questions should involve the search for more complete sections which also yield rich perisphinctid and possibly cardioceratid fauna. Such sections are required for the formal introduction of a perisphinctid zonation such as that discussed above.

Paleontological comments

The ammonite fauna will be discussed in detail elsewhere and here are given only some comments. In the descriptions, the following abbreviations are used: D—shell diameter, U—diameter of umbilicus, H—whorl height, T—whorl thickness, r: D—number of primary ribs per whorl at a given diameter.

Family Perisphinctidae Steinmann, 1890

Genus *Perisphinctes* Waagen, 1896

Perisphinctes bernensis Arkell, 1944 (non de Lorriol, 1898)

(Pl. 2, fig. 1)

1898 *Perisphinctes bernensis* de Loriol; de Loriol, p. 76 (pro parte), Pl. V, fig. 24 (only).
1944 *Perisphinctes (Properisphinctes) bernensis* de Loriol; Arkell, p. 272, pl. LXI, figs 5–6.

Material. Three specimens.

Description. Three specimens, the most complete and best preserved of which attains 64 mm in size (D Ph ? 38 mm, H/D 0.28, U/D 0.52, T/D 0.28–0.30 at D=60 mm, H/D 0.30, U/D 0.54 and T/D c. 0.32 at D=50 mm). Coiling markedly evolute, whorl section subcircular, constrictions very deep. Ribs slightly to markedly prorsiradiate; point of furcation obscured by subsequent whorl. Secondaries most probably passing through the venter without interruption except for the sections between parabolae, where they markedly weaken.

Remarks. The specimens closely resemble the large one assigned to *Perisphinctes bernensis* by de Loriol (1898, p. V, fig. 24) and especially those assigned to that species by Arkell ([1], p. 272, pl. LXI, figs 5–6) in the mode of coiling, whorl shape and sculpture. According to Arkell ([1], p. 273), his specimens provide "little to add to the several previous descriptions of this species", except for the fact that *P. bernensis*, as represented by his complete specimen from Scarborough, seems very close to *P. ouatius* Buckman, the genotype of "*Otosphinctes*", except for being more involute, with rather more ribs, and by having a rather longer body chamber. According to him, "it would be reasonable to regard *P. bernensis* as the direct forerunner of *P. ouatius* and so of at least the '*Otosphinctes*' group of *Dichotomosphinctes*" ([1], p. 273).

An alternative interpretation of *P. bernensis* de Loriol was given by Malinowska ([11], p. 154) with reference to the large assemblage of Lower Oxfordian ammonites from Wrzosowa and other localities in the Polish Jura Chain. She stated that the highly varied appearance and shell dimensions do not actually reflect intraspecific variation and that the name was given to inner whorls of specimes belonging to various species. On the basis of available material, she differentiated 3 varieties referrable to *Perisphinctes (Kranaosphinctes) promiscuus* Buk., *P. (K.) indogermanus* Waagen and *P. (K.) decurrens* Buck., respectively, not excluding at the same time the existence of the species *P. bernensis* de Loriol sensu stricto (but not in the material studied).

The author's analysis generally supported the point of view of Malinowska. The record of *Perisphinctes (Otosphinctes)* cf. *moeschi* de Loriol and other representatives of that subgenus in the lower part of the Wrzosowa section gives the basis for a simpler and more plausible interpretation of the origin of the *Otosphinctes* group than Arkell's hypothesis of its evolution from *P. bernensis* de Loriol. At the same time it should be noted that both the specimens described above and those of Arkell [ä] appear surprisingly close to early *Kranaosphinctes* which gives further support to the interpretation put forward by Malinowska [11].

Occurrence. The Claromontanus Zone (=Bukowskii Zone), Wrzosowa, beds correlable with Beds Nos 24 and 20 [11] and from the waste.

Genus *Prososphinctes* Schindewolf, 1925

Prososphinctes sequeirosi sp. n.

(Pl. 2, figs 4–5)

Holotype. Specimen No. 1514.III.17, figured in Pl. 2, Fig. 4.

Type horizon. Claromontanus Zone (=Bukowskii Zone), Lower Oxfordian.

Type locality. Wrzosowa near Częstochowa, bed No. 20 [11].

Derivation of the name. In honour of Prof. Leandro Sequeiros of Zaragoza University, a student of the Mediterranean Jurassic.

Material. Five specimens.

Diagnosis. Small specimens (about 60 mm in size), with a trend to involute coiling. Whorls subrectangular, flat-sided, markedly compressed. Ribs fine, markedly prorsiradiate, triplicate on body chamber (secondaries-to-primaries ratio close to 2.8 for the second half of body chamber of the holotype), with a trend to obliteration. Parabolic nodes very poorly marked. Constrictions common, narrow and shallow.

Remarks. Specimens assigned to *Prososphinctes sequeirosi* sp. n. seem most similar to that described as *Prososphinctes michalskii* n.f. by Bukowski (1887, p. 153, pl. XXIX, figs 3a–b) in the style of ribbing and size, differing by the much less evolute coiling, more compressed and flat-sided whorls, and finer and more closely spaced ribs. They differ from the representatives of *Prososphinctes mazuricus* (Bukowski) and *P. consociatus* (Bukowski) (see [6, 11]) by smaller size and the earlier onset of trifurcation of ribs. Density and strength of ribs are closer to that of *P. mazuricus* (Bukowski) and inner whorls are similar. All the specimens assigned to the new species were found in the lower part of the Wrzosowa section, beneath the layers bearing first *P. mazuricus* (Bukowski) which would suggest that the latter are descendants of the former. However, *P. sequeirosi* sp. n. is accompanied by the below described *P.* sp. *A*, much closer to *P. mazuricus* (Buk.).

The representatives of *P. sequeirosi* sp. n. somewhat resemble more involute representatives of *P. claromontanus* (Buk.), differing mainly by the trifurcation of ribs on the body chamber.

Occurrence. Lower part of the Claromontanus Zone (=Bukowskii Zone), Wrzosowa, beds corresponding to Beds Nos 20 and 18 in [11] and from the waste.

Prososphinctes sp. *A* *)

(Pl. 1, fig. 3)

Description. Small individuals (70—80 mm in size), somewhat involute to evolute, with high, compressed subrectangular whorls; whorl margins and venter broadly rounded. Ribs triplicate on the body chamber, prorsiradiate and crowded on inner whorls, somewhat more loosely spaced on the body chamber (specimen No. 1514. II.18—r: D: c. 60:40,

*) After discussions with J. H. Callomon and other colleagues I came to the conclusion that the material deserves a new specific name. The species is named *Prososphinctes hughesi* sp. n., in honour of Sir Alec Hughes, the retired secretary of the British Association for the Advance of Science, to whom I am greatly indebted for friendly advice and suggestions. The specimen figured in Pl. 1, Fig. 3 is designated as the holotype. Type horizon and type locality as given in Occurrence.

55:61, 50:68, and 46:74), fading out in the mid-height at the end of phragmocone and the body chamber. Ventral smooth band well developed; constrictions common, weak.

Remarks. The specimens assigned to *Prososphinctes* sp. *A*. are most similar to *P. mazuricus* (Buk.) in the style of ribbing and coiling, differing in smaller size, higher and more compressed whorls and in being markedly less densicostate. As stated above, *P.* sp. *A* may represent the ancestor of the latter species, confined to higher part of the Wrzosowa section.

Prososphinctes sp. *A* is similar to *P. sequeirosi* sp. n. in the mode of coiling and dimensions, differing in more numerous ribs, secondary ribs passing through the venter without any forward sweep, thicker whorls, and generally larger size.

Occurrence. Lower part of the Claromontanus Zone (=Bukowskii Zone), Wrzosowa, beds Nos 18, 20, and 22 in [11] and from the waste.

Warm thanks are due to J. H. Callomon, R. Enay, L. Malinowska, D. Marchand, I. G. Sapunov, Z. Różak, R. Tarkowski, and A. Zeiss for fruitful discussions, comments and advice.

INSTITUTE OF GEOLOGY, RAKOWIECKA 4, 00-975 WARSAW
(INSTYTUT GEOLOGICZNY)

REFERENCES

[1] W. J. Arkell, *A monograph on the ammonites of the English corallian beds*, Palaeontogr. Soc. (London), xxxiv+420 p.

[2] J.-P. Bourseau, Nouv. Arch. Mus. Hist. nat. Lyon, fasc. 15, 1977, 116 p.

[3] W. Brochwicz-Lewiński, Bull. Ac. Pol.: Terre, **24** (1976), 37–46.

[4] W. Brochwicz-Lewiński, ibidem, **26** (1978), 163–172.

[5] Brochwicz-Lewiński, Z. Różak, Acta Palaeont. Polon. **21** (1976), 373—390.

[6] G. Bukowski, Beitr. Pal. Geol. Oesterr., Ungarns, Orients, **5** (1887), 57–1971,

[7] E. Cariou, R. Enay, H. Tintant, C. R. Somm. Seances Soc. Géol. Fr., **6** (1971), 18–21.

[8] R. Enay, H. Tintant, E. Cariou, *Les faunes Oxfordiennes d'Europe Meridionale; Essai de zonation*, Coll. Int, du Jurassique, Luxembourg 1967 (preprint).

[9] P. de Loriol, Mém. Soc. paléont. suisse, **25** (1898).

[10] L. Malinowska, Kwart. Geol., **2** (1958).

[11] L. Malinowska, Prace Inst. Geol., **36** (1963), 1–165.

[12] L. Malinowska, Kwart. Geol., **22** (1978), 309–321.

[13] B. A. Matyja, Acta Geol. Polon., **27** (1977), 41–64.

[14] D. Marchand, W. Brochwicz-Lewiński, Przegląd Geol., **28** (1980).

[15] S. Z. Różycki, Prace Inst. Geol., **17** (1953), 1–335.

[16] I. G. Sapunov, Geologica Balc., **6** (1976), 19–36.

[17] I. G. Sapunov, *Ammonoidea, Fossilite na Blgarie*, vol. III. 3, Gorna Jurska Serja, Blgarska Akademia na Naukitie, Sofia, 1979, 263 p.

[18] J. Siemiradzki, *Geologia Ziem Polskich*, Muzeum im. Dzieduszyckich Lwów, 1922, 535 p.

[19] R. Sykes, J. H. Callomon, Palaeontology, **22** (1979), 839–903.

[20] L. Malinowska, Biul. Inst. Geol. **209** (1967), 53–112.

В. Брохвич-Левиньски, **Раннеоксфордские перисфинкты околиц Ченстоховы и их стратиграфическое значение**

В разрезе нижнего и низов среднего оксфорда во Вжосовой и в других обнажениях Польской Юры можно выделить две фаунистические группы: старшую, характеризующуюся *Prososphinctes claromontanus* (Buk) и родственными видами и младшую, характеризующуюся *Perisphinctes (Otosphinctes) paturattensis* de Loriol. Сравнение границ распространения групп перисфинктов и кардиоцерас подтвердило верность выделения горизонта Episcopalis И. Г. Сапуновым (16–17) и выявило возможность выделения горизонта Claromontanus который был бы аналогом кардиоцерасового горизонта Bukowskii (или подгоризонта Bukowskii горизонта Cortatum). Данз описание и/или предсавлен *Perisphinctes bernensis* Arkell (non de Loriol), *Prososphinctes sequerosi* sp.n. и другие виды, весьма важные для стратиграфии.

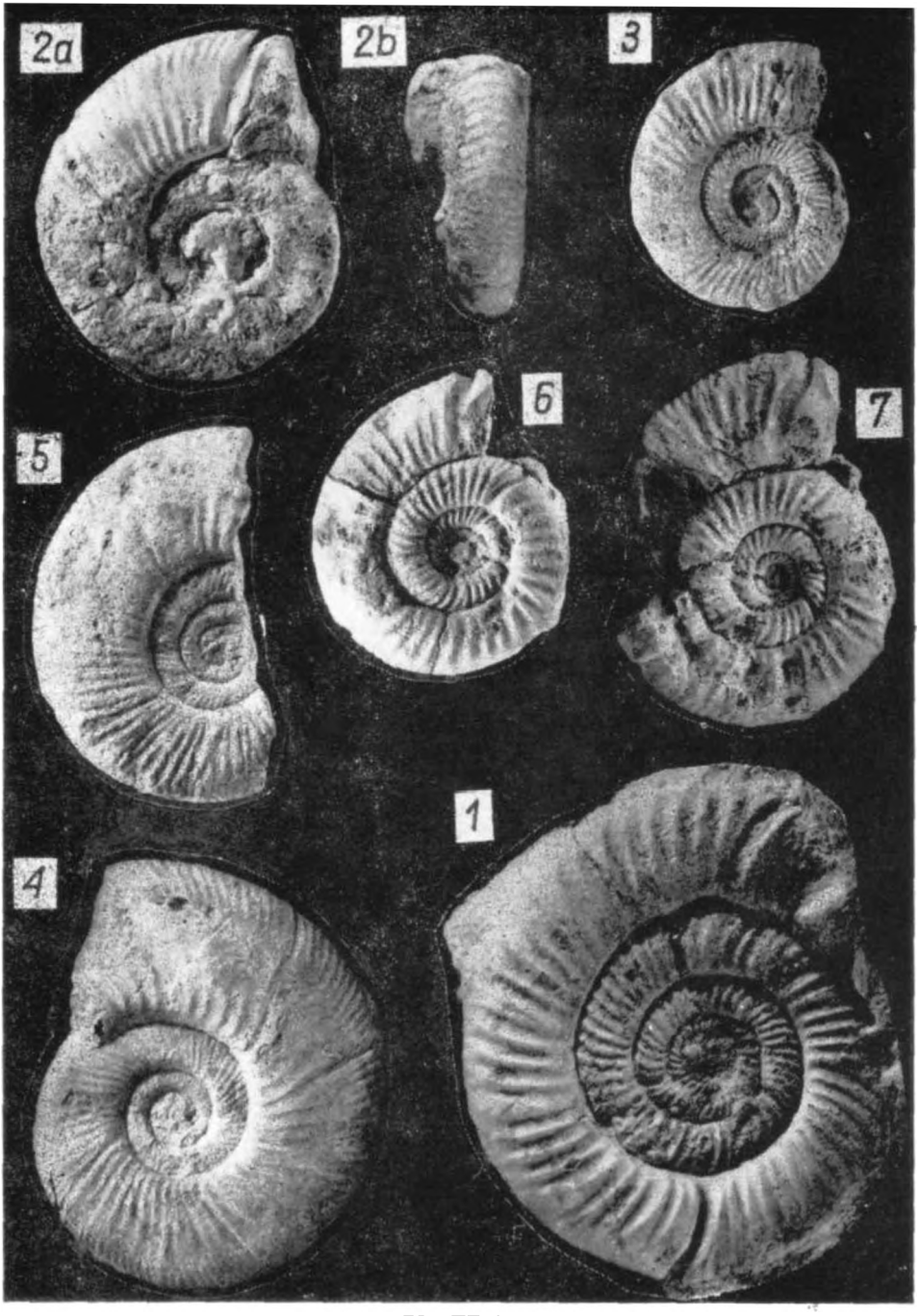


PLATE 2

Perisphinctes bernensis Arkell non de Loriol: 1 — specimen No. 1514.II.9, Wrzosowa, Claromontanus Zone, D 64 mm, at D 60 mm, H/D 0.28, U/D 0.52, T/D c. 0.29; *Prososphinctes claromontanus* (Buk.): 2 — specimen No. 1514.II.23, Wrzosowa, Claromontanus Zone, D 49.5 mm, complete, lappeted, 3 — specimen No. 1503.II.55, as above, D 38 mm, note prominent parabolic nodes and ventral smooth band; *Prososphinctes sequeirosi* sp. n.: 4 — holotype, specimen No. 1503.II.17, as above, D 57, H/D 0.38, U/D 0.37, at D 45 mm, H/D 0.39, U/D 0.36, 5 — specimen No. 1503.II.73, as above, D 50.5 mm, H/D 0.34, U/D 0.37; *Perisphinctes (Otosphinctes) cf. moeschi* de Loriol: 6 — specimen No. 1503.II.2, as above, D 52 mm, Ph c. 31 mm, at 40 mm, H/D 0.32, U/D 0.46, T/D 0.30, lappeted, 7 — specimen No. 1503.II.3, as above, D 44 mm, Ph 26.5 mm, at 33.5 mm H/D 0.33, U/D 0.48, T/D 0.33

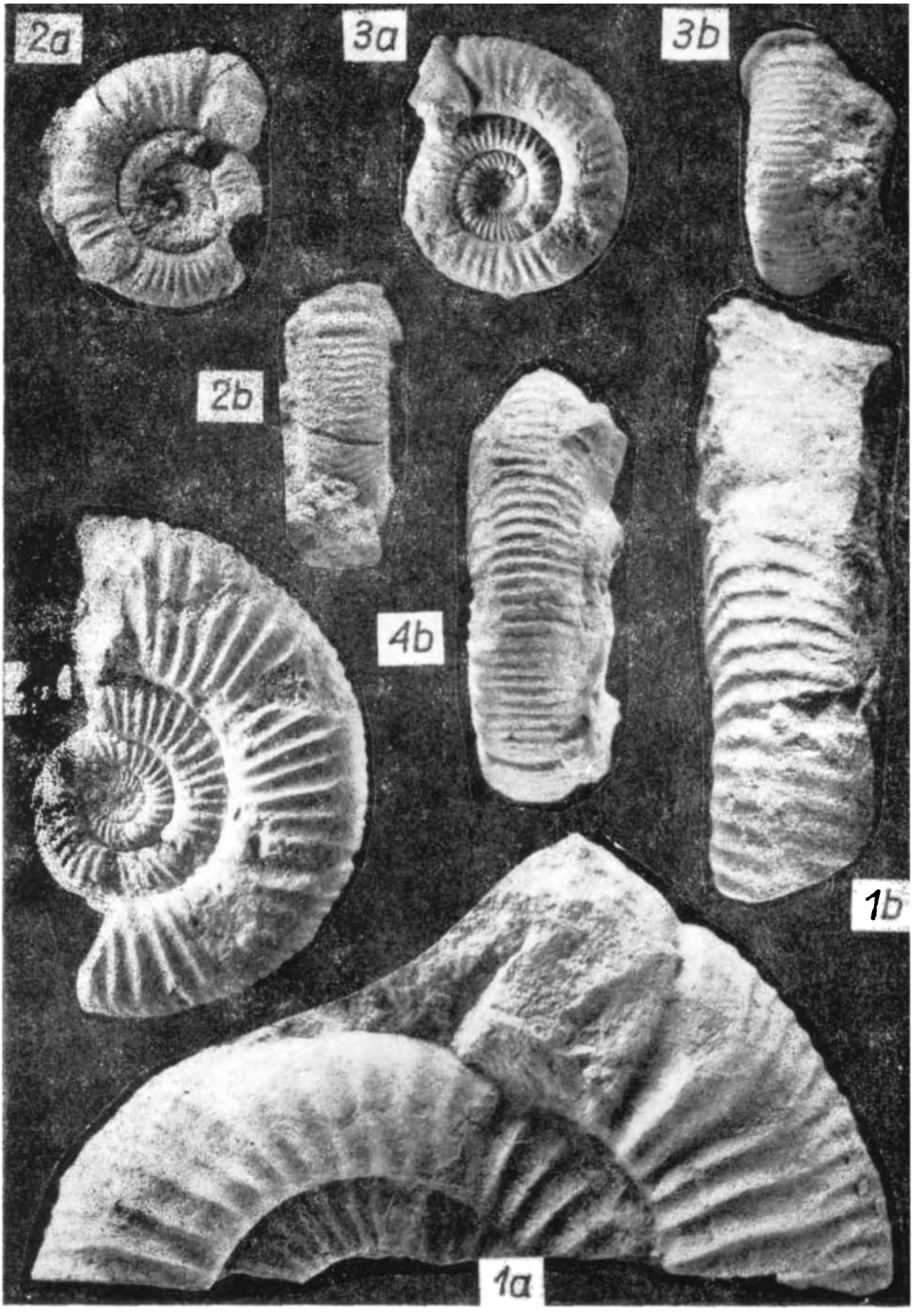


PLATE 3

Kranaosphinctes promiscuus (Buk): 1 — specimen No. 1503.II.18, displaying both ventral rostrum (1a—b) and lappets (1a), and a change from tri- to biplicate ribbing close to the peristome, Ogrodzieniec, Antecedens Zone, most probably lower part of Rotoides horizon, D c. 115 mm; *Perisphinctes (Otosphinctes) paturattensis* de Loriol: 2 — specimen No. 1503.II.82, Wrzosowa, Episcopalis/Paturattensis Zone, lappeted, D 35 mm, Ph 23 mm, H/D 0.37, U/D 0.49, T/D 0.36, 3 — specimen no. 1503.II.80, as above, lappeted, D 37.3 mm, Ph 23 mm, at D 36 mm H/D 0.33, U/D 0.47, T/D c. 0.33; *P. (O.)* ex gr. *montfalconensis* de Loriol: 4 — specimen no. 1503.II.86, Wrzosowa, coll. by L. Malinowska, most probably upper part of Excavatum (=Episcopalis/Paturattensis) Zone, D 65 mm, Ph 32.5 - 45 mm, H/D 0.34, U/D 0.45, at D 32.5 mm, H/D 0.37, U/D 0.45, T/D 0.38

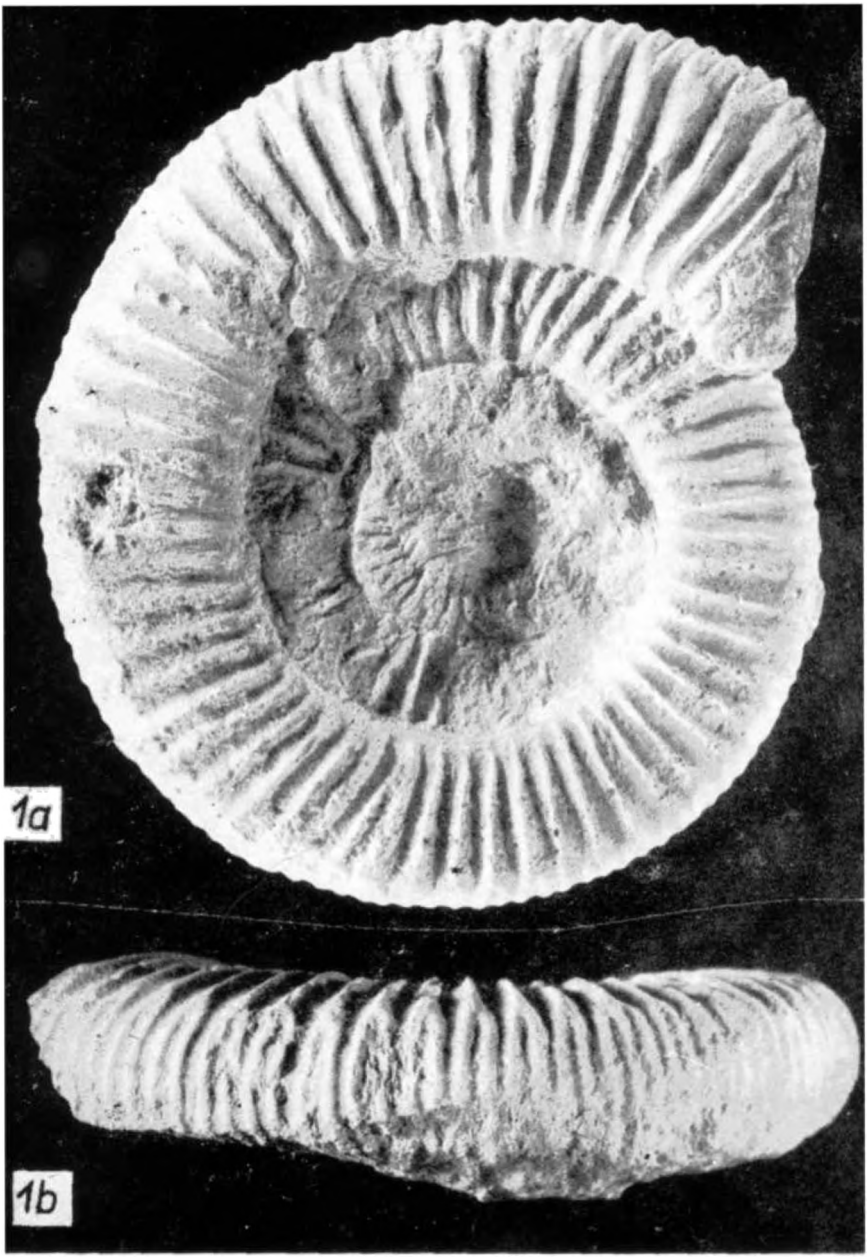


PLATE 4

Transitional form between *Perisphinctes (Dichotomosphinctes) rotoides* Ronchadze, and *P. (D.) antecedens* Salfeld, specimen No. 1503.II.1, Ogrodzieniec, derived most probably from limestone bed No. 14 [14], nat. size. Antecedens Zone, Rotoides Subzone