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STRINGOCEPHALUS BURTINI DEFRANCE FROM THE ENVIRONS OF SIEWIERZ, POLAND

Abstract. — The results of investigations on *Stringocephalus burtini* from the Limestone of Dziewki, Givetian, vicinity of Siewierz, with some remarks on the palaeoecology of the species are given.

INTRODUCTION

Stringocephalus burtini Defr. has been known for many years from Poland, but, up to now, has not been described or illustrated. This is, no doubt, connected with the very poor state of preservation of the specimens which in general are not suitable for more detailed studies.

First data on this species from the Silesian-Cracowian Upland can be found in Roemer's papers (1866, 1870). Only very brief information and one poor drawing partly, illustrating the shell interior of *S. burtini* from the Limestone of Dziewki, environs of Siewierz are given. Gürich (1903) mentions this species in Dębnik (vicinity of Cracow), Siemiradzki (1903, 1922) includes it in the list of fossils from the Silesian-Cracowian Upland and for the first time from the Holy Cross Mountains (Góry Świętokrzyskie). Samsonowicz (1930) states the presence of *S. burtini* in the eastern part of the Holy Cross Mts. (Jurkowice-Budy). Further mentions of this species are found in more recent papers, e.g. Siedlecki, 1954; Klimek & Koszarski, 1955; Śliwiński, 1956; Pajchel, 1959; Pajchel & Stasińska, 1965; Filonowicz, 1967. From all these very superficial data it is not clear whether the cited specimens from the Silesian-Cracowian Upland can be really assigned to *S. burtini*, the more so as the illustrations are missing.

The studied specimens, collected in 1969—1970 from the Limestone of Dziewki, although very poorly preserved, enable one to make a sufficiently detailed analysis of their external morphology and to some extent, the internal structure, and to identify them as *Stringocephalus burtini* Defrance.

ACKNOWLEDGEMENTS

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All the studied material is deposited at the Palaeozoological Institute, Polish Academy of Sciences, Warszawa, for which the abbreviation Z.Pal. is used.

REMARKS ON GEOLOGY AND STRATIGRAPHY

Givetian deposits are exposed in a small area North of Siewierz, vicinity of Dziewki, Podlaśna, Brudzowice and Nowa Wioska, within the area of Triassic and Quaternary deposits, forming two ridges (F. Roemer, 1866; Śliwiński, 1956): a northern ridge built of, the so named, Lime-

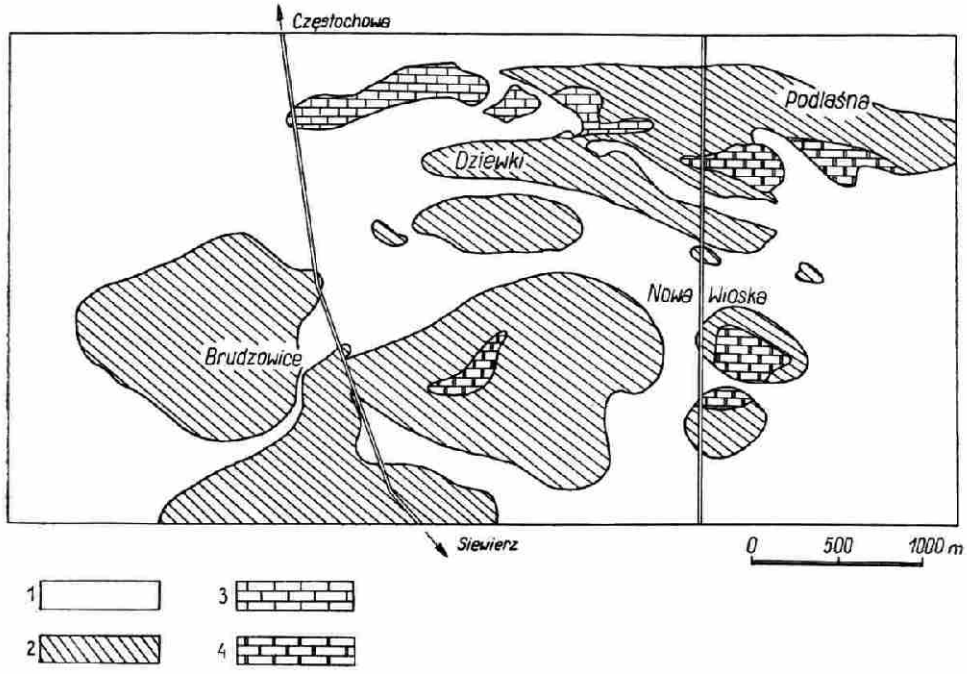

Fig. 1. — Geological sketch map, environs of Brudzowice and Dziewki (after Śliwiński, 1956, slightly changed).

1 — Quaternary, sands; 2 — Triassic (muschel-kalk, keuper), limestones, dolomites, clays; 3 — Devonian (Givetian), limestones (Limestone of Dziewki); 4 — Devonian (Givetian), dolomites.

stone of Dziewki, which to the East passes into dolomites, the southern one built of dolomites.

Due to the lack of more recent descriptions of the Devonian fauna of Siewierz it is difficult to define the precise stratigraphical age of the Limestone of Dziewki. The presence of *Stringocephalus burtini* indicates that the discussed limestone is not older than the lowermost Givetian (Struve, 1963; Boucot, Johnson & Struve, 1966), and the occurrence of the genus *Heliolites* that it is not younger than uppermost Givetian (Sokolov, 1962).

In the Limestone of Dziewki *S. burtini* occurs in two kinds of deposits exposed, among others, near the road (East of it) Siewierz-Częstochowa. These are: 1) Banks of biostromal limestone gray, micritic, slightly bituminous; of the brachiopods usually occur only the fragments of separated valves of *S. burtini,* complete shells being very rare and, in addition, seriously damaged; of the other fossils rugose corals and stromatoporoids dominate; 2) The limestones of the second kind are much less micritic, forming thick banks poor in fossils, represented only by brachiopods and solitary corals: *S. burtini* is preserved in complete shells of different size.

DESCRIPTION

Family **Stringocephalidae** King, 1850
Subfamily **Stringocephalinae** Cloud, 1942
Genus *Stringocephalus* Defrance, 1825
Stringocephalus burtini Defrance, 1825
(Pls. I—II; Text-figs. 2—4)

1825. *Terebratula burtini* Defr.; J. M. L. Defrance, *In*: H. M. D. Blainville, Manuel de malacologie..., p. 511; atlas (1827), Pl. 53, Fig. 1—1c.

1942. *Stringocephalus burtini* Defr.; P. E. Cloud, Terebratuloid..., pp. 107—108, Pl. 17, Figs. 3—6; Pl. 18, Figs, 1, 4, 6, 7 (*here synonymy from* 1827 to 1936).

1963. *Stringocephalus burtini* Defr.; J. Dvořak & V. Havliček, Ramenonožci..., p. 89, Pl. 1, Figs. 1—3.

Material. — The collection includes 10 almost complete shells of *S. burtini* and more than 200 fragments. The shells are very firmly attached to the matrix. The complete shells are infilled with the micritic sediments. The best preserved specimens come from th weathered rock. The size of the specimens ranges in the limits of a few mm to a few cm.

Dimensions (in mm):

Features \ Z. Pal. Bp. XVI	32	167	170	3	15	1
Length vv	33	50	48	42	49	105
Length dv	23	36	41	31	36	85
Width	33	50	47	—	—	100
Thickness	15	25	30	17	29	73
Width of pedicle foramen	4	—	—	6	4	2.8
Umbonal angle of vv	95°	84°	86°	—	—	87°
Umbonal angle of dv	—	—	—	154°	—	156°
$\frac{\text{Length vms}}{\text{Length vv}} \cdot 100\%$	—	—	88	86	87	—
$\frac{\text{Length dms}}{\text{Length dv}} \cdot 100\%$	—	—	—	—	67	—

vv — ventral valve
dv — dorsal valve
vms — ventral median septum
dms — dorsal median septum

Description. — Shell strongly ventri-biconvex, roundly outlined, large, almost as wide as long, attaining 11.5 cm or more in length, heart- or pear-like in outline; antero-lateral margins rounded, hinge line slightly arcuate, anterior commissure rectimarginate.

Ventral valve strongly convex, beak large, very incurved, area large, slightly concave posteriorly, weakly sculptured; pedicle foramen small, elipsoidal, moved posteriorly.

Dorsal valve strongly convex, constituting to about 40% of the whole shell thickness, almost round in outline.

Interior: The ventral valve displays a long median septum, thin anteriorly, low and thick posteriorly; teeth in the shape of horns weakly curved, rudiments of dental plates sometimes present, in gerontic specimens a callus closes internally the pedicle foramen. In the dorsal valve the median septum is high posteriorly, in general shorter than that of the opposite valve; cardinal process long, massive, arcuate distally bifurcate; hinge plate large, slightly arcuate, relatively thin (Text-figs. 2, 3), teeth sockets deep, narrowing medially; scars of adductors preserved.

Variability in the growth process. — The main changes in growth concern the degree of the shell convexity, size and the degree of the ventral beak curvature, size of the deltidial plates restraining the pedicle foramen.

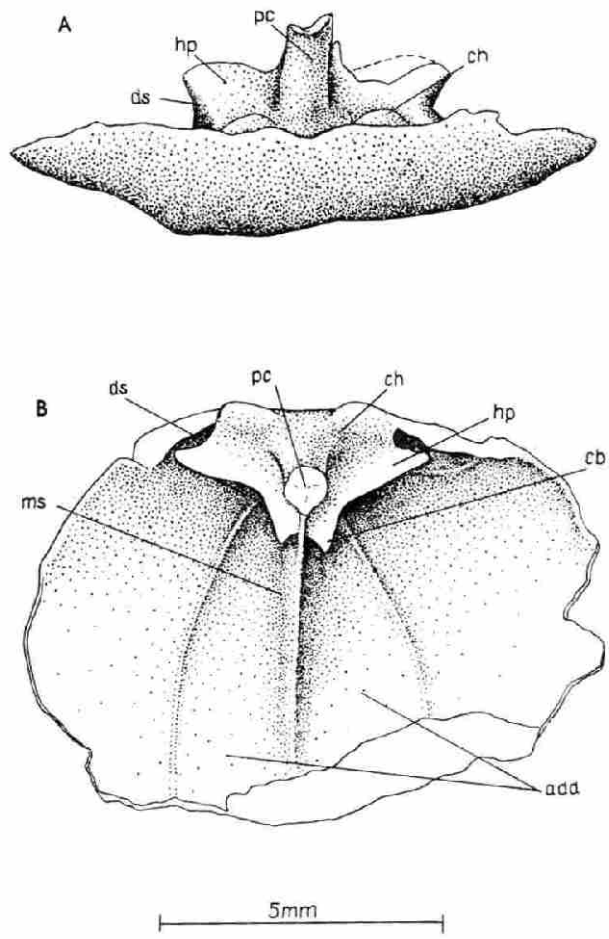

Fig. 2. — *Stringocephalus burtini* Defr. Limestone of Dziewki (Bp. XVI/163); interior of the small dorsal valve: *A* ventral view, *B* posterior view, *pc* — fragment of the cardinal process, *ds* — dental sockets, *hp* — hinge plates, *cb* — crural bases, *ms* — medium septum, *ad* — adductors, *ch* — chilidial plates.

Small shells, to about 3.5 cm long, are flattened, their thickness attains about 45% of the shell length; shells to above 10 cm long are strongly convex, almost spherical — their thickness constituting about 72% of the whole shell length. In specimens 3 cm—5 cm long the ventral beak is straight, high about 30% of the valve length, its height diminishes with growth to about 25% and in gerontic specimens to about 19%, being in side view inclined to the marginal plane.

Delthyrium, open and triangular in youth, is subsequently, with growth, closed by the delthyrial plates, which in specimens to about 4—6 cm long are joined; the pedicle foramen changes in outline from lenticular to elliptical (Text-fig. 5). In the gerontic specimens the size of the pedicle foramen appears to be stable due, in all probability, to

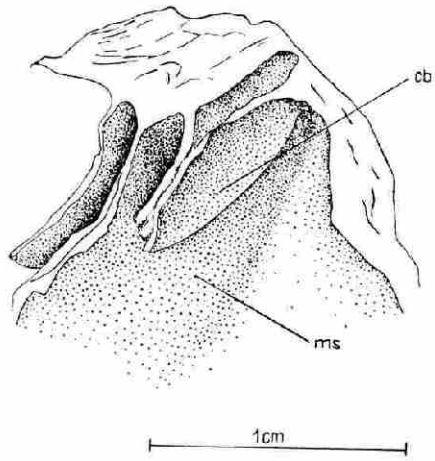

Fig. 3. — *Stringocephalus burtini* Defr., Limestone of Dziewki (Bp. XVI/70); posterior fragment of a large dorsal valve, very damaged: *ms* medium septum; *cb* crural bases.

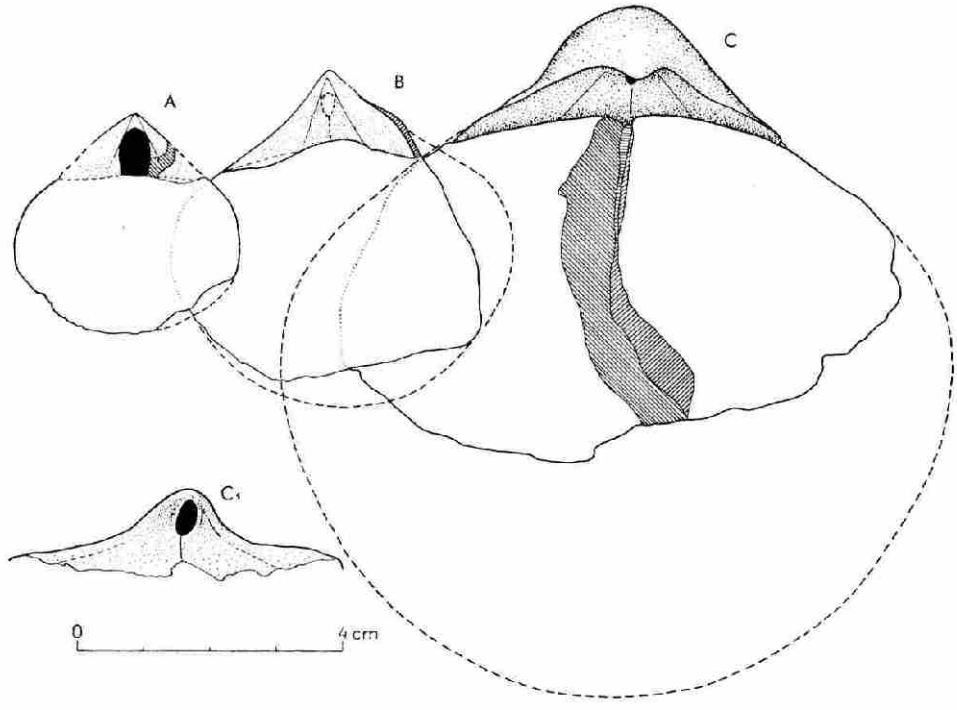

Fig. 4. — *Stringocephalus burtini* Defr. Limestone of Dziewki: *A*—*C* three shells (Bp. XVI/32, 167,1) of different individual age in dorsal view, C_1 ventral umbo in anterior view.

the callus closing the foramen from the interior (Pl. II, Fig. 2). In consequence, the pedicle disappears and this is a gerontic features (Cloud, 1942, p. 105). The scarcity of material makes impossible a more detailed observations.

Comparison. — The discussed specimens display the characters of the typical *Stringocephalus burtini* Defr., differing a little only in having a slightly larger umbonal angle. In the characteristic lateral furrows on both sides of the pedicle foramen and the rudimentary dental plates they are very close to the *Stringocephalus* sp. from Paffrath (Cloud, 1942, Pl. 18, Figs. 3, 5). As the length and height of the median septum in typical *S. burtini* are not exactly known (including the limits of the individual variability), it is at present not possible to use these features for comparison with the type species.

REMARKS ON PALAEOECOLOGY

The Givetian sea in the Siewierz region was, in all probability, shallow and moderately calm, but with a little differentiated conditions of sedimentation. The biostromal limestone was deposited in the most shallow places. The rugose corals and stromatoporoids dominate, being accompanied by much less numerous crinoids, gatropods, e.g. *Murchisonia,* and very rare brachiopods such as atrypids, ambocoelids, the most abundant being *Stringocephalus burtini* Defr. Its poor state of preservation is evidence of a strong water movement. The fragments of shells or valves of different size, carried by currents accumulated in the depressions of the biostromes, forming there discontinuous layers.

Less micritic limestone with a very poor fauna characterizes a slightly deeper and calmer sea, the agitation of water being very weak. The fauna there consists of solitary corals and rare *S. burtini,* this latter preserved as complete shells attaining a very large size.

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REFERENCES

BOUCOT, A. J., JOHNSON, J. G. & STRUVE, W. 1966. Stringocephalus, ontogeny and distribution. — *J. Paleont.*, **40**, 6, 1349—1364, Menasha.

CLOUD, P. E., Jr. 1942. Terebratuloid Brachiopoda of the Silurian and Devonian. — *Geol. Soc. Amer., Spec. Paper,* **38**, 1—182, Baltimore.

DEFRANCE, J. M. L. 1825—1827. *In*: H. M. D. Blainville, Manuel de malacologie et de conchyliologie, 1—647, Paris.

DVORAK, J. & HAVLIČEK, V. 1963. Ramenonožci „Stringocefalovych" Vapencu na Morave. — *Sborn. Ustř. Ust. Geol.*, **28**, 85—99, Praha.

FILONOWICZ, P. 1967. Wapienie ze Stringocephalus w Czarnowie koło Kielc. — *Kwart. Geol.*, **11**, 2, 958—959, Warszawa.

GÜRICH, G. 1903. Das Devon von Dębnik bei Krakau. — *Beitr. Paläont. Geol. Österr.-Ungarns*, B, **15**, 4, 127—164, Wien.

KLIMEK, S. & KOSZARSKI, L. 1955. Stratygrafia Dębnika w porównaniu z dewonem obszarów sąsiednich. — *Przegl. Geol.*, **8**, 388, Warszawa.

PAJCHLOWA, M. 1959. Zagadnienia stratygrafii i rozwoju facji dewonu w Polsce. — *Przegl. Geol.*, **7**, 2, 73—82, Warszawa.

— & STASIŃSKA, A. 1965. Utwory rafowe w dewonie Gór Świętokrzyskich. — *Acta Palaeont. Pol.*, **10**, 2, 249—260, Warszawa.

ROEMER, C. F. 1866. Über die Auffindung devonischer Kalksteinschichten bei Siewierz im Königreiche Polen. — *Ztschr. Deutsch. Geol. Ges.*, **18**, 433—438, Berlin.

— 1870. Geologie von Oberschlesien. 1—587, Breslau.

SAMSONOWICZ, J. 1930. Sprawozdanie z badań geologicznych wykonanych w lecie w roku 1926 na pd.-zachód od Klimontowa na arkuszu Sandomierz. — *Pos. Nauk. P. Inst. Geol.*, **26**, 11—13, Warszawa.

SIEDLECKI, S. 1954. Utwory paleozoiczne okolic Krakowa (Zagadnienia stratygrafii i tektoniki). — *Biul. Inst. Geol.*, **73**, 1—224, Warszawa.

SIEMIRADZKI, J. 1903. Geologia ziem polskich, I. 1—472, Lwów.

— 1922. Geologia ziem polskich, wyd. 2, I. 1—535, Lwów.

ŚLIWIŃSKI, S. 1956. O występowaniu wapieni i dolomitów dewońskich koło Siewierza. — *Zesz. Nauk. AGH*, **9**, 1, 91—117, Kraków.

SOKOLOV, B. S. 1962. Gubki, archeociaty, kischetschnopolostnye. *In*: J. Orlov (ed.), Osnovy paleontologii, 1—484, Moskva.

STRUVE, W. 1963. Devonische Schaltiere aus der Bohrung Münterland 1. — *Geol. Landesamt Nord.-West., Fortschr. Geol. Rhein. Westfalen*, **11**, 343—351, Krefeld.

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STRINGOCEPHALUS BURTINI DEFR. (BRACHIOPODA) Z ŻYWETU OKOLIC SIEWIERZA

Streszczenie

Rodzaj *Stringocephalus* Defrance znany jest z terenu Polski z żywetu Gór Świętokrzyskich i regionu Śląsko-Krakowskiego. Niniejsze opracowanie dotyczy *S. burtini* z tzw. wapieni Dziewek, które odsłaniają się ok. 4 km na północ od Siewierza. Stan zachowania fauny stringocefalusowej w tych wapieniach jest bardzo zły, co poważnie utrudniało przeprowadzenie badań.

Wieku wapieni Dziewek nie można określić ściśle, gdyż brak jest nowszych opracowań fauny z tego obszaru. Obecność w tych wapieniach rodzaju *Stringocephalus*, pojawiającego się nie wcześniej niż w najniższym żywecie, oraz koralowca *Heliolites* nie przechodzącego do dewonu górnego, pozwala zaliczyć jedynie te utwory do żywetu.

Wapienie Dziewek reprezentowane są przez stromatoporowo-koralowcowe wapienie biostromalne (osady płytszego, ruchliwego morza) oraz przez wapienie mikrytowe z nieliczną fauną (prawdopodobnie osady nieco głębszego morza). W wapieniach biostromalnych *S. burtini* występuje najczęściej w postaci pojedynczych i silnie pokruszonych skorup. W wapieniach drugiego typu muszle są całe.

АНДЖЕЙ БАЛИНЬСКИ

STRINGOCEPHALUS BURTINI DEFR. (BRACHIOPODA) ИЗ ЖИВЕТСКОГО ЯРУСА ОКРЕСТНОСТЕЙ СЕВЕЖА, ПОЛЬША

Резюме

Род *Stringocephalus* Defrance известен на территории Польши из живетского яруса Свентокшиских гор и Силезско-Краковского региона. Настоящая работа посвящена *S. burtini*, распространенному в так называемых известняках местности Дзевки, которые обнажаются около 4 км севернее г. Севежа. Сохранность стрингоцефалусовой фауны в этих известняках крайне плохая, что в значительной степени осложняло проведение исследований.

В настоящее время нет данных для более детального определения возраста известняков местности Дзевки из-за отсутствия новых работ по фауне этого района. Распространение в этих известняках рода *Stringocephalus*, появившегося не ранее низов живета, а также кораллита *Heliolites*, который не переходит в верхний девон, позволяет лишь с достоверностью отнести эти породы к живетскому ярусу.

Известняки местности Дзевки представлены строматопоро-кораллитовыми биостромными известняками (отложения неглубокого, подвижного моря) и микритовыми известняками с небогатой фауной (по-вероятности, отложения более глубоководной зоны моря). В биостромных известняках *S. burtini* чаще всего встречается в виде отдельных, сильно раздробленных створок. В известняках второго типа наблюдаются целые раковины.

Plate I

Stringocephalus burtini Defrance
(Limestone of Dziewki, Givetian)

Figs. 1—3. Three damaged specimens (Bp. XVI/32, 167, 15): *a* dorsal, *b* lateral views; × 1.

Fig. 4. Cross section of the dorsal valve (Bp. XI/40): showing large hinge plates and medium septum; × 1.

Fig. 5. Ventral umbo (Bp. XVI/1) of adult specimen; × 1.5.

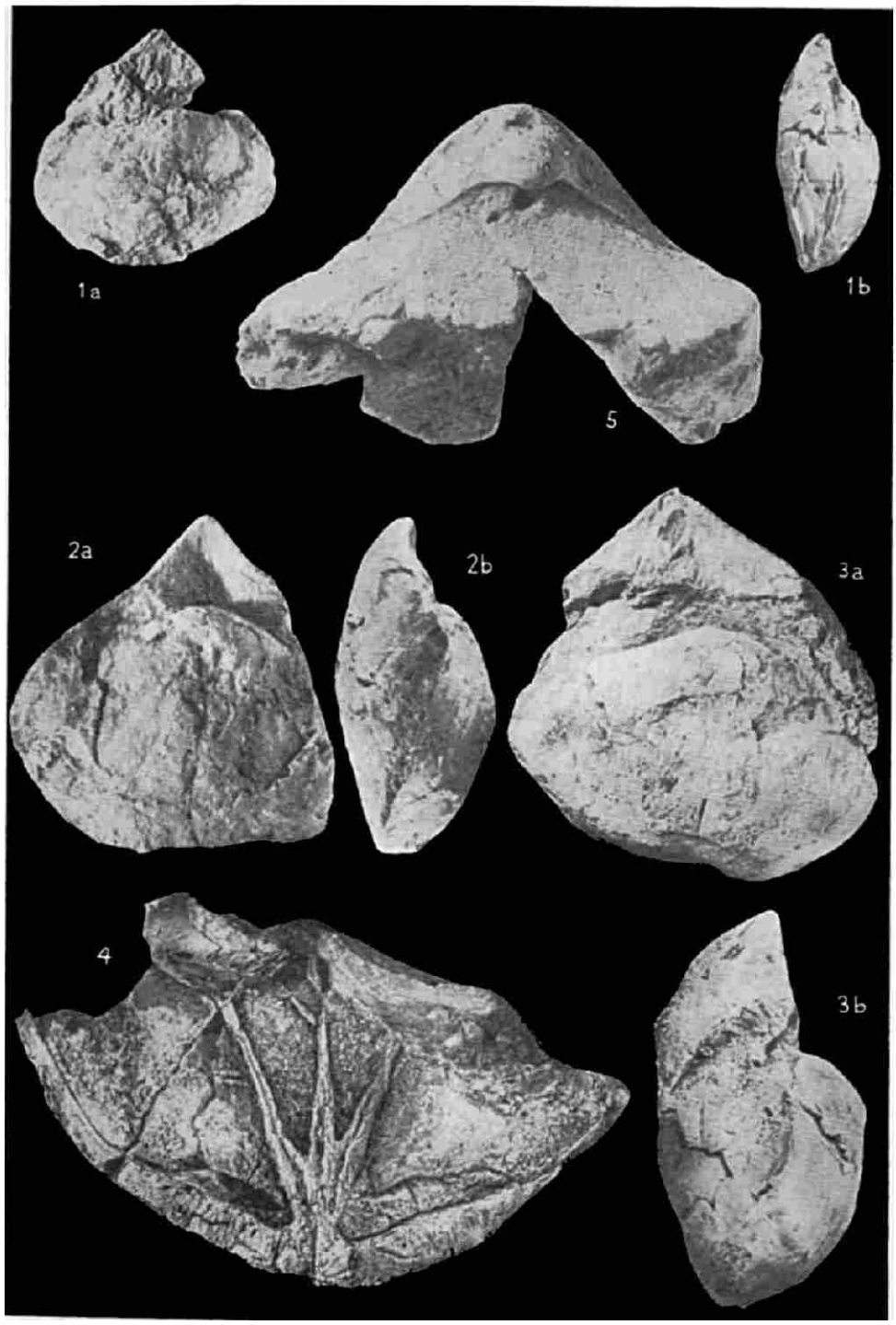
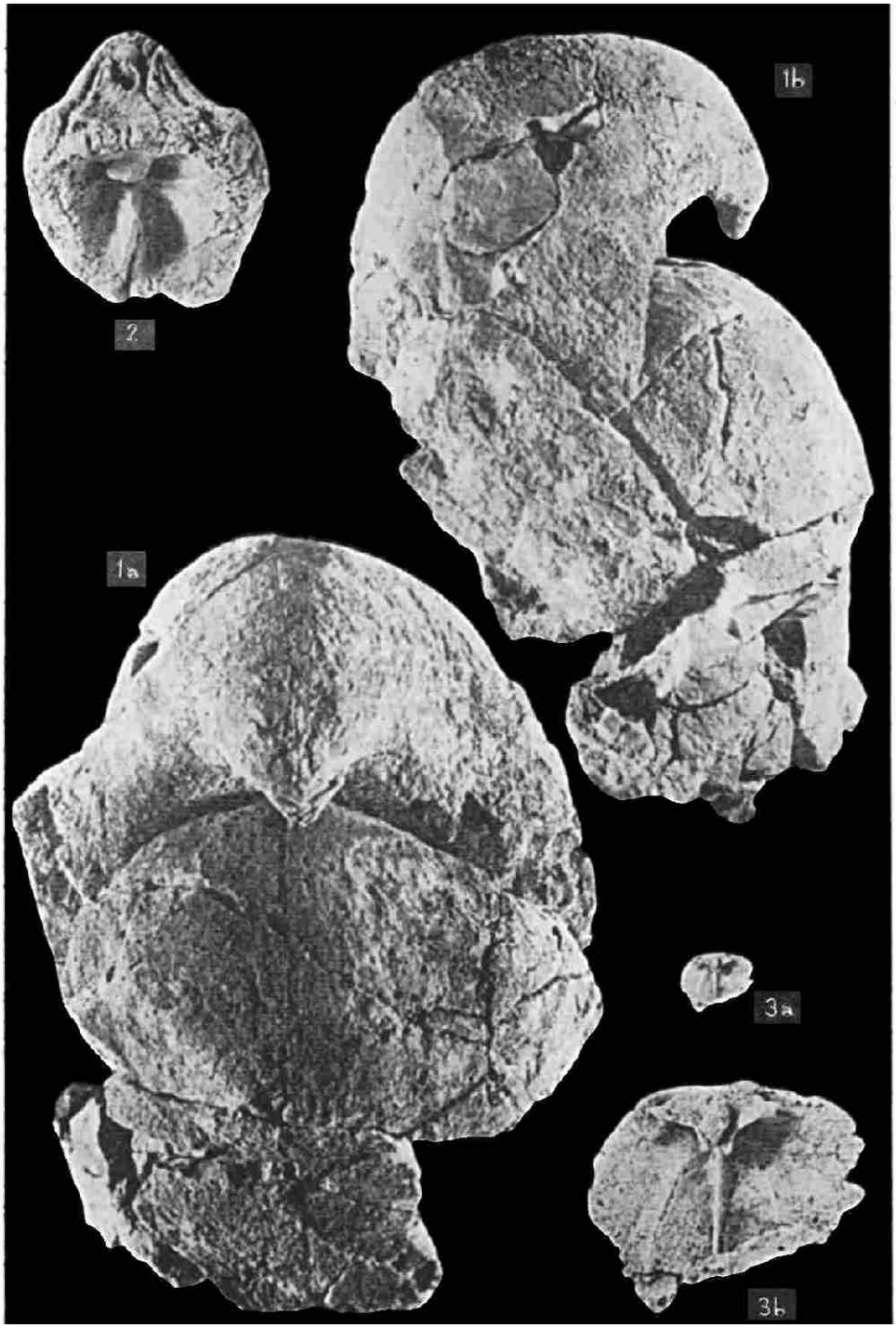

1a
1b
5
2a
2b
3a
4
3b

Plate II

Stringocephalus burtini Defrance
(Limestone of Dziewki, Givetian)

Fig. 1. Gerontic specimen (Bp. XVI/165) very damaged: *a* dorsal, *b* lateral views.
Fig. 2. Fragmentary ventral umbo (Bp. XVI/2) of the gerontic shell, with preserved „callus" in the pedicle foramen; × 1.
Fig. 3. Internal view of a young dorsal valve: *a* × 1, *b* × 4.


1b
2
1a
3a
3b