

## Lower Pliensbachian ammonites of Villány (Hungary)

Barnabás GÉCZY

Department of Palaeontology, Eötvös University  
H-1083 Budapest, Ludovika tér 2, Hungary

(with 4 text-figures and plates 1-27)

### Introduction

The ammonites of Villány have been studied for more than 125 years. LENZ (1872) called the attention upon the ammonite-rich quarry near the railway station of Villány. HOFMANN (1876) collected the fossils and made a geological map; he assigned the fauna to the Upper Dogger. The classical monographs on Callovian ammonites of TILL (1910) and LÓCZY jun. (1915) were mainly based on collections of the 19th century. LÓCZY (1911) recognised that the "Callovian" ammonite bed of "Mészhegy", i.e. Templom Hill can be followed as far as the top of Somssich Hill. The Templom Hill quarry has been abandoned at the beginning of the 20th century. Since new forms exotic to the Callovian (e.g. *Villania*) were described in both monographs, a new artificial outcrop was made in 1967 for better understanding of local stratigraphy. Upon the initiative of József FÜLÖP, the Hungarian Geological Institute established the new outcrop at Somssich Hill, exposing the Jurassic sequence for the field trip of the Mediterranean Jurassic Colloquium. Professors D. AGER, J. CALLOMON, and D. DONOVAN, participants of the excursion in 1969, recognised Pliensbachian ammonite-bearing layers below the Callovian bed. The first Pliensbachian fauna has been published by AGER et al. (1971), together with photographs of the outcrop. A sedimentological study of the classical locality at Templom Hill and of the new outcrop at Somssich Hill was published by VÖRÖS in 1972 (Text-fig. 1). Since 1967 Attila VÖRÖS, András GALÁ CZ, and the author collected Pliensbachian ammonites at both localities. A brief review of the ammonites was published in GÉCZY (1984). Together with J. L. DOMMERGUES he published seven species of the fauna in 1989, with a far-reaching palaeobiogeographical analysis.

The 1989 study corroborated the plate tectonic hypothesis (GÉCZY, 1973) that both Villány and Mecsek Hills belonged to the northern margin of Tethys in the Jurassic, and were emplaced to its present-day position subsequently. It is due to DOMMERGUES that a close relationship of the Eodocerataceae of Villány to those of the Subbriançonnais zone of the Préalps (Chablais) and of the Pontides was recognised. The co-occurrence of *Epideroceras*, *Coeloderoceras*, *Villania*, and *Tetraspidoceras* is restricted to the Subbriançonnais zone within the Euroboreal realm. All four genera are missing in the Appennines (DOMMERGUES & MEISTER, 1991). A very small number of *Epideroceras* and *Tetraspidoceras* has been found in the Bakony (GÉCZY, 1976). *Villania* occurs at Bilecik, west of Ankara (ALKAYA, 1982). In a palaeobiogeographic synthesis of the Western Tethys VÖRÖS (1993) stated that Villány belonged to the Northwest European Tisia terrane, while Bakony was part of the Mediterranean microcontinent, separated from both the African and the European shelves.

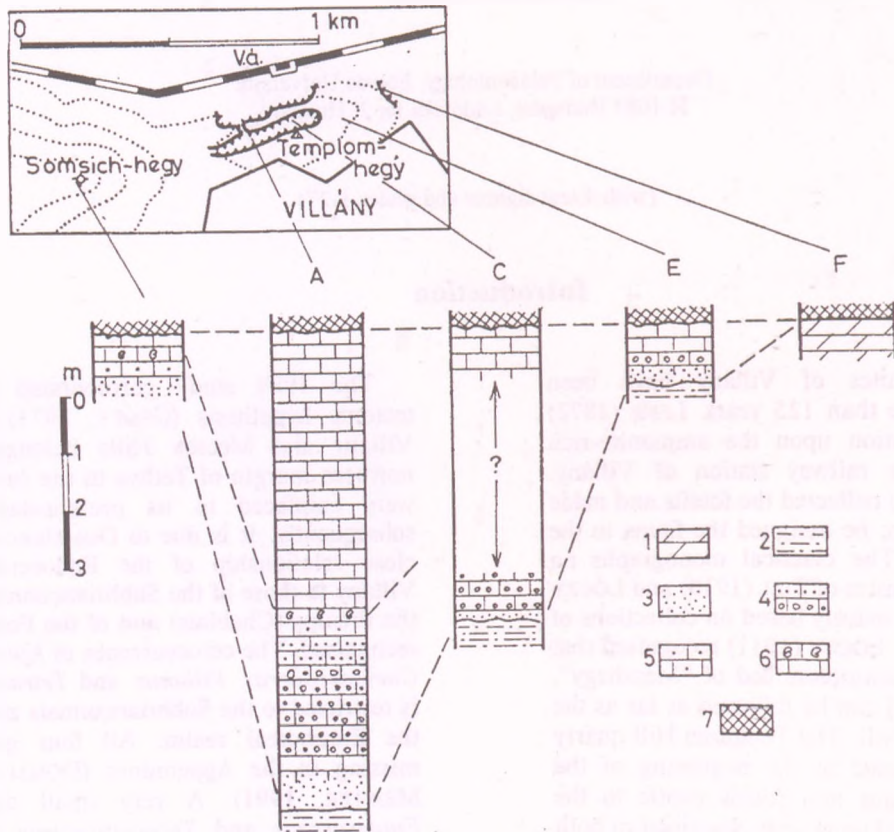
The need for reliable palaeobiogeographical data justifies the publication of the Villány fauna. This study was prepared at the Department of Palaeontology of Eötvös University, Budapest. Financial support was provided by the Hungarian National Science Foundation (OTKA T 015897 grant). Sincere thanks are due to dr. A. GALÁ CZ and dr. M. MONOSTORI for reviewing the manuscript, to dr. M. KÁZMÉR for the translation, to Mrs. L. PELLÉ RDI, A. GALÁ CZ, and I. SZENTE for photographing the specimens, and to O. SZIVES for drawing whorl sections of ammonites. The Villány fauna has been studied at the Department of Palaeontology by Professors J. L. DOMMERGUES, C. MEISTER, and R. SCHLATTER; their remarks are sincerely acknowledged.

The systematical part follows the classical and clear subdivision of the Treatise. The Villány fauna is not suitable for the revision of the Eoderocerataceae superfamily.

The classical literature on Upper Lotharingian and Lower Pliensbachian

ammonites is fully referenced in SCHLATTER (1991).

All specimens and characteristic whorl sections are figured in natural size.



Text-fig. 1. The Pliensbachian sequence at Villány. 1. Middle Triassic dolomite. 2. Unconsolidated sandy sequence of unspecified age. 3. Pliensbachian calcareous sandstone. 4. Pliensbachian calcareous conglomerate, clayey, sandy limestone. 5. Pliensbachian sandy limestone. 6. Pliensbachian limestone with a faunal horizon. 7. Middle Jurassic beds (VORÓŠ, 1972).

## Systematical part

Superfamily *Phyllocerataceae* ZITTEL, 1884

*Phylloceras* cf. *hebertinum* (REYNES, 1868)  
Pl. 1, figs 1-2.

Material: 1 specimen from Somssich Hill, lower part of the Carixian bed, collected in 1969.

Dimensions: D = 40 mm

H = 23 mm (57.5%)

W = 20.5 mm (50.5%)

W = 5.1 mm (12.7%)

Description: A single, strongly recrystallised, fragmented, small specimen. Section of the rapidly growing whorls is almost elliptical. Greatest width is at the middle of the lateral side. Umbilicus is narrow and deep.

Suture line can be traced only on the ventral part. E is narrower and shorter than L. m. ES is biphyllid, the ventral phyllum terminates deeper than the inner one.

Remarks: The Villány specimen is related to *P. hebertinum* (REYNES, 1868, p. 94, T. II, fig. 3) and of *P. wahnneri* GEMMELLARO (1884, p. 11, pl. I, figs 1-3). Shape of the two species is similar, while the suture lines are different. According to the revision of FANTINI SESTINI (1974, p. 225) all saddles of *P. hebertinum* are biphyllid, while the ventral sella of *P. wahnneri* is triphyllid, and the lateral sella (LS) is quadriphyllid. Observation of the full suture line is needed for precise determination of the specimen.



Distribution: "*Ammonites hebertinus*" was described by REYNES from the Margaritatus Zone of Bosc (Aveyron). The species can be found in the whole Pliensbachian. The type of *P. wagneri* is from the Carixian of Sicily (Galati). Outside of Hungary *P. hebertinum* occurs in France, Italy, Austria and the Caucasus. *P. hebertinum* was identified by COPE (1991, p. 303) and by ALKAYA & MEISTER (1995, p. 135) from the Pontides (Anatolia).

*Partschiceras cf. striatocostatus*  
(MENEHINI, 1853)  
Pl. I, figs 3-4.

Material: 1 specimen from Somssich Hill, collected in 1969.

Dimensions: not available due to poor preservation.

Description: Single, partially chambered whorl fragment with high elliptical section. Lateral sides are almost parallel. The ventral margin is highly rounded, venter is wide and low. There are strong, wide, ring-like wrinkles on the ventral side, and there are 4-5 narrow ribs (striae) between them. Ribs and wrinkles are radial. The suture line cannot be studied due to poor preservation.

Remarks: Shape and ornamentation is identical to those of *P. striatocostatus* (MENEHINI, 1853, p. 28 = *Ammonites partschii* STUR, 1851, p. 26). Revision of *P. striatocostatus* is due to FANTINI SESTINI: he says that it differs from *P. anonymum* (HAAS, 1913, p. 7, pl. 1, figs 1-5) only in the lack of periumbilical wrinkles. This region is missing in the Villány specimen, preventing precise identification. Section resembles *P. striatocostatum*.

Distribution: According to FANTINI SESTINI, *P. striatocostatum* occurs both in the Sinemurian and in the Carixian. *P. anonymum* is characteristic for the Pliensbachian, especially for the Domerian. WIEDENMAYER (1977, p. 17) corroborated the great vertical distribution of the species (from the Upper Sinemurian Raricostatum Zone to lowermost Toarcian Tenuicostatum Zone).

*Tragophylloceras numismale* (QUENSTEDT,  
1845)  
Pl. 2.

1845 *Ammonites heterophyllus numismalis* -  
QUENSTEDT, p. 100, pl. 6, figs 4-5 (only)

1964 *Tragophylloceras numismale* (QUENSTEDT) -  
HOWARTH & DONOVAN, p. 295, pl. 48, fig. 5 (cum  
syn.)

1982 *Tragophylloceras numismale* (QUENSTEDT, 1845) -  
HOFFMANN, p. 123, pl. 1, figs 1-3, pl. 2, fig. 1.

1991 *Tragophylloceras numismale* (QUENSTEDT) - COPE,  
p. 305, pl. 1, fig. 4, pl. 2, fig. 6.

Material: 1 specimen, bought from E. DEMEL by the Hungarian National Museum in 1908.

Dimensions: D = 271.8 mm

H = 132.5 mm (48.6%)

W = 69.8 mm (25.6%)

U = 48.0 mm (17.7%)

Description: Single, very large, well-preserved internal mould. Umbilicus is shallow and wide. The oblique, convex umbilical wall displays a gradual transition to the slightly convex lateral side without forming an umbilical edge. The venter is rounded. Whorl section is high-oval: greatest width is at the inner third of the lateral side. The mould shows no ornamentation; near the umbilicus there are dense, weak, slightly forward projecting stripes. Only the posterior part of the body chamber is preserved.

The suture line is richly indented. E is shorter than the long L, subdivided to three main branches. ES is wide; there are 5 or 6 umbilical lobes.

Remarks: Shape and suture lines of the Villány specimen are of the *T. numismale*. The full diameter was significantly larger than in specimens described from England (20-22 cm) and northwestern Germany (30 cm).

Distribution: *Tragophylloceras* is the single Euroboreal genus of the Juraphyllitidae family. There are exceptional occurrences of *T. numismale* in Anatolia and in "Rosso Ammonitico" facies. The species ranges through the whole Jamesoni Zone.

Superfamily Lytocerataceae NEUMAYR, 1875

*Lytoceras cf. fimbriatum* (SOWERBY, 1817)  
Pl. 1, fig. 5.

Material: 3 specimens. Templom Hill: 1 specimen, collected by FÜLÖP and VIGH from Bed 4. Somssich Hill: 2 specimens, collected in 1970 from the Carixian bed.

Dimensions: D = 180 mm

H = 67 mm (37.2%)

W = ?

U = 74 mm (41.6%)

Description: Three large, poorly preserved specimens. The Templom Hill specimen is an internal mould, the Somssich Hill ones bear parts of the shell. Umbilicus is shallow and wide. There are neither umbilical, nor ventral edges on evenly convex lateral sides. The whorl section is high-elliptical or oval, slightly widening towards the ventral part. Widest point of the whorls is near the middle of the lateral sides. The shell is ornamented by raised ribs, slightly bent and convex forward; many of them are serrated. There are 52 ribs to a quarter whorl. There are several constrictions to the whorl of different depth. Posterior part of the body chamber is preserved on the Templom Hill specimen. There is a constriction on the

body chamber of the large whorl ( $H = 78$  mm,  $W = 61$  ? mm), too.

The suture line is poorly preserved. The wide L is longer than E, the ventral part is better developed than the inner. U is much smaller than L.

Remarks: The Villány specimens resemble *Ammonites fimbriatus* SOWERBY the best, figured by D'ORBIGNY (1842, p. 313, pl. 98). PRINZ (1904) considered this form a new species: *Lytoceras postfimbriatum*. SPATH (1934, p. 442), HOWARTH (1957, p. 195), and DONOVAN (1958, p. 8) included *L. postfimbriatum* into the species *L. fimbriatum*. Holotype of *L. fimbriatum* was re-figured by BUCKMAN (1919, pl. 130). Whorl section of the holotype is circular, but of the topotype is elliptical. POMPECKJ (1896, p. 297) recognised that specimens of *Lytoceras fimbriatum* from England and France have oval whorl section and constrictions develop in large whorls, too. These characters are recognised on the poorly preserved Villány specimens, too, conditionally identified with SOWERBY's species.

Distribution: According to HOWARTH, it is almost certain that *L. fimbriatum* was found in the Ibex Zone of Dorset. It has long range: occurs from the base of the Ibex Zone to the middle of the Margaritatus Zone in England. RAKÚS (1964, p. 113, pl. 18, figs 3-4) published a form similar to the Villány specimens under the name *Lytoceras cf. postfimbriatum* from the Jamesoni Zone of the High Fatra, Slovakia.

Superfamily Psilocerataceae HYATT, 1867

*Radstockiceras cf. involutum* (POMPECKJ, 1907)  
Pl. 3, Pl. 4, figs 1-2.

1959 *Oppelia* cfr. *aspidoidea* OPP. - KASZAP, p. 267.

Material: 2 specimens. One from the upper part of the larger quarry at Templom Hill, collected by P. SZABÓ in 1957; another specimen is from the Somssich Hill, collected in 1970.

Dimensions:  $D = 222.0$  mm  
 $H = 126.5$  mm (56.9%)  
 $W = 48.0$  mm (21.6%)  
 $U = 11.0$  mm (5.9%)

Description: Two large, poorly preserved internal moulds, filled by calcite crystals. Umbilicus narrow, perpendicular umbilical side is slightly convex, umbilical edge rounded. The convex sides converge to a blunt keel. Inner whorl of the Somssich Hill specimen bears a roof-like ventral part with rounded edges and well-developed, sharp keel. Whorl section is spear-shaped, greatest width at the middle of the lateral side. The mould bears no ornamentation. Body chamber is not preserved.

The suture line is richly dissected. E is wide, and somewhat shorter, than the better developed L. ES is wider and lower than LS.

Remarks: Despite the poor preservation, the whorl section and the suture line corresponds to those of the type of *R. involuta* (POMPECKJ, 1906, p. 204), described by FUTTERER as "*Oxynoticeras oppeli*" (1893, p. 292, pl. 8, figs 1-2; non SCHLOENBACH). The original description mentions a sharpening then blunting keel. Lack of the fine ornamentation of the type prevents reliable identification with *R. involutum*.

Distribution: FUTTERER indicates that "*Oxynoticeras Oppeli*" occurs solely in the lower bed of the Jamesoni limestone, i.e. from the base of the Jamesoni Zone. Besides Germany the species occurs in France and in Portugal; a subspecies was found on the Bakony Hill, Hungary (GÉCZY, 1976, p. 37). The specimens from Germany (see SCHLATTER, 1980, p. 53) and from Portugal (see MOUTERDE et al., 1983, pl. 4, fig. 8) are characteristic for the Polymorphum Subzone.

*Radstockiceras cf. buvignieri* (D'ORBIGNY, 1844)

Pl. 4, figs 3-5.

Material: 3 specimens from the Somssich Hill, collected in 1970.

Dimensions:  $D = 94.0$  mm  
 $H = 56.0$  mm (58.4%)  
 $W = 18.6$  mm (19.73%)  
 $U = 3.0$  mm (3.1%)

Description: Three specimens of medium preservation, partly filled by calcite crystals. The umbilicus is very narrow. Umbilical wall cannot be studied. The slightly convex lateral sides converge to form a blunt keel. Whorl section is spear-shaped, largest width is near the umbilicus. Ornamentation cannot be observed. All specimens lack the body chamber.

The suture line shows slightly longer E than the asymmetrically tripartite L. There are several umbilical elements, gradually decreasing in size.

Remarks: The Villány specimens are very similar to *Ammonites Buvignieri*, described by D'ORBIGNY (1844, p. 261, T. 74).

Distribution: *R. buvignieri* was described by D'ORBIGNY from Middle Liassic beds in Breux. Besides Northwestern Europe it occurs in Italy, Anatolia, and possibly in Indonesia. Everywhere it is characteristic for the Jamesoni Zone (see BREMER, 1965, p. 149, cum syn.).

*Radstockiceras cf. evolutus* (FUCINI, 1901)

Pl. 4, fig. 6.

Material: 1 specimen from Templom Hill, collected by Fülöp & Vigh from Bed 3.

Dimensions:  $D = 45$  mm  
 $H = 22.4$  mm (49.8%)  
 $W = 11$  mm (24.4%)  
 $U = 9$  mm (20%)



**Description:** A single, small, poorly preserved mould, partly filled by calcite crystals. The umbilicus is relatively wide, the umbilical wall is steep, the umbilical edge is rounded. The barely convex lateral sides are almost parallel, in the ventral third convergent. The venter is sharp, although there is no distinct keel. Whorl section is spear-shaped. Largest width is measured in the inner third of the lateral sides. Rarely short, projecting ribs can be observed near the external part under proper illumination. The suture line cannot be studied in detail.

**Remarks:** The Villány specimen, bearing a wide umbilicus, is close to the type published by FUCINI (1901, p. 7, T. 1, fig. 11) as *Oxynoticeras numismale* QUENST. var. *evoluta*. As one can observe, ornamentation is similar, too. Suture line of the type specimen displays a narrower ES and a wide-bodied L, than the Villány specimen.

The 'varieties' of FUCINI is a subspecies of *Radstockiceras complanosum* (SIMPSON, 1855) according to POMPECKJ (1907, p. 273), PIA (1914, p. 44), and BREMER (1965, p. 151). The wide umbilicus and the suture line make *R. evolutum* and *R. complanatum* easily separable.

**Distribution:** Type of *Radstockiceras evolutum* was found at Monte di Cetona, probably in the Sinemurian.

Superfamily Eoderocerataceae SPATH, 1929

*Hyperderoceras retusum* (SIMPSON, 1855)  
Pl. 5, figs 1-2.

1855 *Ammonites retusus* M. SIMPSON, p. 62.

1980 *Hyperderoceras retusum* (SIMPSON, 1855) - SCHLATTER, p. 61 (cum syn.), pl. 3, fig. 56, Beil. 3, figs a-c, Beil. 14, fig. a.

1984 *Apoderoceras* cf. *sociale* (SIMPSON, 1855). - GÉCZY, p. 191.

1987 *Hyperderoceras retusum* (SIMPSON) - DOMMARGUES, p. 100, pl. 1, figs 1-2.

1989 *Hyperderoceras retusum* (SIMPS.) - DOMMARGUES & GÉCZY, p. 24, Pl. 1, figs 1-2.

**Material:** 1 specimen. Templom Hill, collected in 1969.

**Dimensions:** cannot be given due to poor preservation.

**Description:** A single specimen of medium size and medium preservation, a mould fragment. The umbilicus is wide and gradually deepens. The convex sides run into a wide, low ventral part, not forming any distinct umbilical or ventral edge. Whorl section is trapesoidal. Width - especially on the inner whorl - is higher than height. Greatest width is at the ventral part. The penultimate whorl is ornamented by strong, ventral nodes far from each other, extended into ribs, which disappear towards the umbilicus. Umbilical seam of the last whorl

does not cover the nodes. There are primary ribs of various thickness and distance on the last whorl, and faint intercalate ribs between them. The primary ribs are prorsiradiate, forming an elongate, node-like swelling. Differences between primary and intercalate ribs are indistinct on the ventral side. The venter bears dense, narrow ribs. The body chamber is not preserved.

E cannot be studied on the suture line due to poor preservation. L is very long, has narrow body, branches manifold.

**Remarks:** Whorl section, and especially the very irregular ribbing make the Villány specimen well identifiable with SCHLATTER's specimen (1980, pl. 3, fig. 6). *Hyperderoceras* is very close to *Eoderoceras* and *Apoderoceras* (DOMMARGUES, 1987, p. 100).

**Distribution:** *H. retusum* is very rare in SW Germany, according to SCHLATTER, occurring in the upper part of the Taylori Subzone. DOMMARGUES knows it from the Taylori Horizon in Burgundy (Corbigny).

*Apoderoceras antiquum* (LÓCZY, 1915)  
Pl. 12, figs. 1-3.

1915 *Aspidoceras antiquum* nov. sp. - LÓCZY, p. 427, pl. 14, figs 1-2.

1931 "*Aspidoceras*" *antiquum* LÓCZY - SPATH, p. 568.

1971 *Apoderoceras* aff. *aculeatum* (SIMPSON, 1843) - CALLOMON, p. 11.

**Material:** 1 specimen from Villány, collected by HOFMANN in 1874.

**Dimensions:** cannot be given due to poor preservation.

**Description:** Single whorl fragment of poor preservation. The umbilical wall is oblique, low, convex, and gradually turns into the very slightly convex lateral side not forming an umbilical edge. Whorl section is kidney-shaped, the largest width is at the ventral edge. The lateral sides are ornamented by swells, blurred internally, stronger ventrally, slightly oriented posteriorly and convex posteriorly. These terminate in well-developed, blunt nodes, spaced irregularly along the ventral edge. Ventral part of the internal whorl was ornamented by dense, radial ribs of regular spacing. Ventral part of the preserved whorl is almost totally smooth, although proper illumination shows radial swells connecting the nodes. Five nodes make 10 swells on the ventral part.

The suture line cannot be studied.

**Remarks:** LÓCZY's original description is in need of a few additions. The lateral sides are neither smooth nor concave. The lateral swellings can be observed rather on the other side of the type specimen, not illustrated by LÓCZY. LÓCZY recognised that the Villány specimen is similar to *Deroceras* (= EODEROCERAS), and supposed

that *Aspidoceras antiquum* is a link between *Derocheras* and *Aspidoceras*. LÓCZY compared the Villány species to *D. venarensis* (= *Metaderoceras venarensis*).

SPATH (1931) compared '*Aspidoceras*' *antiquum* with *Peltoceras solidum*, described by himself, although considered uncertainties due to the fragmented preservation of the Villány species.

It is due to CALLOMON that the *Apoderoceras* affinity of *A. antiquum* was recognised. He considered the fragmented specimen of Villány to *Apoderoceras aculeatum* (SIMPSON, 1843). The paratype of *A. aculeatum* was re-figured by BUCKMAN (1913, pl. 72). *Aculeatum* differs from *A. antiquum* by a much higher whorl and by a strongly convex ventral side. Whorl section and ornamentation rather resembles *Apoderoceras subtriangulare* YOUNG & BIRD, 1822 (see BUCKMAN, 1913, pl. 71). Whorls of *A. subtriangularis* are still higher than of *A. antiquum*, and ribs are stronger on the lateral side.

Distribution: The species closest related to *A. antiquum* are characteristic for the lowermost part of the Jamesoni Zone (see DEAN et al., 1961, p. 463), for the Taylori Subzone, or for its lowermost horizon (*Apoderoceras nodogigas* Horizon) (see SCHLATTER, 1991, p. 24).

*Tetraspidoceras ? loczyi* n. sp.

Text-fig. 2, Pl. 5, fig. 3, Pl. 6, Pl. 7, figs 1-2, Pl. 8, figs 1-2, Pl. 9, figs 1-2, Pl. 10, Pl. 11

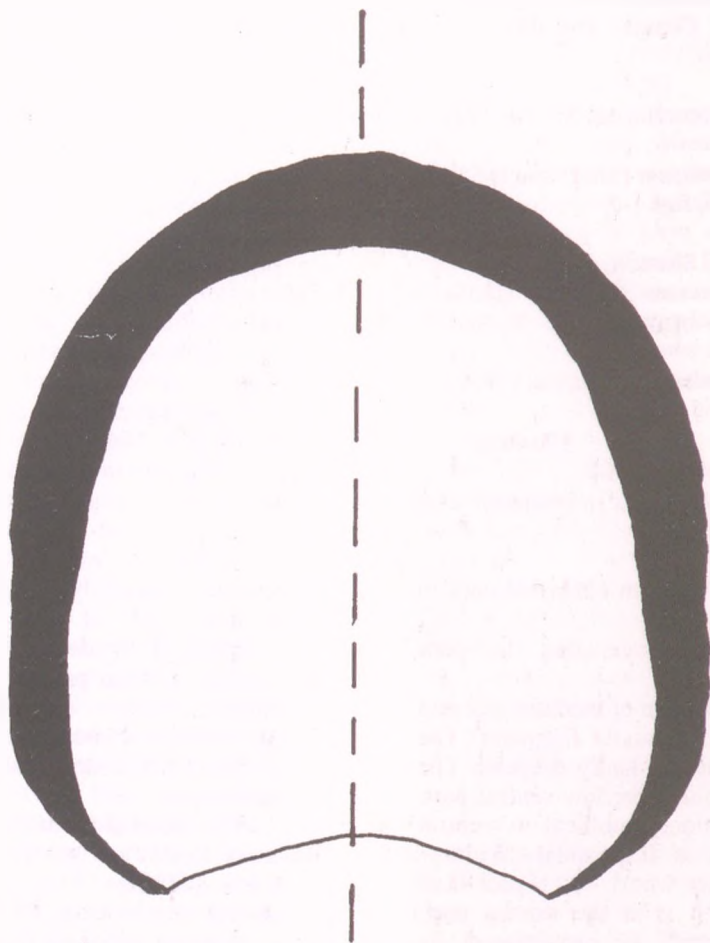
1915 *Perisphinctes* sp. indet. - LÓCZY, p. 425, text-fig. 141.

1971 *Apoderoceras* cf. *lobulatum* BUCKMAN, 1921 - CALLOMON, p. 10, text-fig. 1-2.

1971 *Apoderoceras forox* BUCKMAN, 1925 - CALLOMON, p. 11.

1984 *Tetraspidoceras quadrarmatum* (DUMORTIER, 1869) n. subsp. - GÉCZY, p. 191.

1989 *Tetraspidoceras* sp. aff. *morogensis* (DUM.) - DOMMERGUES & GÉCZY, p. 24.



Text-fig. 2. *Tetraspidoceras ? loczyi* n. sp. whorl section. Actual size.



Type: Pl. 5, fig. 3, Pl. 6.

Locus typicus: Villány, Somssich Hill

Stratum typicum: grey, compact limestone (Jamesoni Zone).

Derivatio nominis: named after Lajos LÓCZY, jun., author of the Callovian monograph of Villány.

Material: 5 specimens.

Dimensions: D = 397 mm

H = 90 mm (22.6%)

W = 83 mm ? (20.9% ?)

U = 239 mm (60.2%)

Diagnosis: Suboval, subquadratic, then subcircular whorl section. The ventral row of nodes turns to isolated, rarely spaced, sharp ribs, crossing the venter.

Description: Two, large-size, entire specimens and several fragments. The umbilicus gradually widens during growth. Umbilical wall is high, steep, slightly convex. The umbilical edge is rounded. Sides of the internal whorl are convex, of the ventral whorls almost parallel. Anterior part of the body chamber has concave lateral sides. The ventral edge is more rounded on the internal whorl and on the anterior part of the last whorl, than on the ventral whorls. Section of internal whorls is high-elliptic, then almost quadrangular, finally subcircular. Maximum width is at the internal third of the lateral side. Internal whorls are ornamented by straight, slightly projecting, almost identical ribs near the umbilical edge. Near the umbilical edge the primary ribs bear nodes elongated parallel with the ribs. Three narrow ribs start at the nodes. There are 2-3 intermediate ribs between the node-bearing main ribs. A half whorl bears 10 node-bearing primary ribs. At larger diameters the ribs are swelled and somewhat thicker, than the space between them. Primary ribs bear an elongated rib at the ventral third of the lateral side; these are not covered by the subsequent whorl. During further growth the intermediate ribs disappear, the ventral row of nodes become stronger, and the ventral side is crossed by uniform ribs. Strength and shape of the primary ribs significantly varies during growth. The ventral row of nodes remains characteristic, although frequently appears a node-like swelling on the ribs at the internal third of the lateral side. In the anterior part of the last whorl the nodes disappear; the ribs are rare, but strong, forming rings around the whorl.

The suture line is richly dissected. E is very long, it has as narrow body as L, which bears two, asymmetrical main branches.

Remarks: The changes in section of the internal whorl and its fine ornamentation resembles the type species of *Tetraspidoceras* SPATH, 1926 (*A. quadrarmatus* DUMORTIER, 1869, p. 60, pl. 10, figs 1-3). The dense, uniform ventral ribbing can be seen as cast in the internal side of the large whorl fragment published by LÓCZY. Subcircular section of the outer whorl and the transition of nodes into ribs differ from

the forms described as *Tetraspidocears* and as *Apoderoceras*.

Distribution: The new species is exclusively known from the Lower Pliensbachian fauna of Villány. *T. quadrarmatum* forms an independent level ("niveau a *quadrarmatum*") at the base of the Taylori Zone (see DOMMERGUES & MEISTER, 1991, p. 312).

*Phricodoceras taylori* (SOWERBY, 1826)

Text-fig. 3, Pl. 13, figs 1-4.

1826 *Ammonites Taylori* - SOWERBY, pl. 514, figs 1-2.

1978 *Phricodoceras taylori* J. DE C. SOWERBY, 1826 - DOMMERGUES, p. 41-45 (cum syn.).

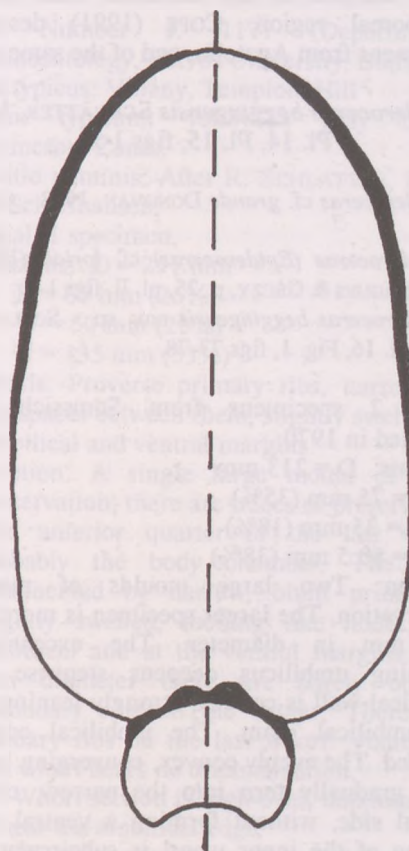
1988 *Phricodoceras taylori* (SOWERBY, 1826) - MEISTER & SCLAU, p. 262, pl. I, fig 1-2.

1989 *Phricodoceras taylori* SOWERBY (forme macroconche) - DOMMERGUES & GÉCZY, p. 25.

1991 *Phricodoceras taylori* (J. DE C. SOWERBY) - COPE, p. 312.

Material: 1 specimen from Somssich Hill, collected in 1970.

Dimensions: cannot be given due to poor preservation.



Text-fig. 3. *Phricodoceras taylori* n. sp. whorl section. Actual size.

Description: A single, large mould fragment; the innermost, recrystallised whorl is preserved, too. The inner whorl section is subcircular, with well-developed ornamentation. There are wide-

based, blunt, extremely well-developed nodes on the lateral side and on the ventral margin of the ventral part, connected to well-developed ribs. The ventral part bears no ornamentation between the ventral nodes; it is narrow, but does not form a furrow. On the anterior part of the penultimate whorl ornamentation is different. Ribs are stronger on the expense of the nodes, and cross the ventral part. Section of the last whorl is high suboval; maximum width is near the umbilicus. The internal row of nodes disappears. The lateral sides are ornamented by wide, blunt, straight, slightly projected ribs, of equal width with the space between them. These form node-like swells near the venter, and cross the ventral part. The body chamber has not been preserved.

Distance of septa and indentation of the suture line is lower than of Villanias. The ventral lobe is long and narrow, the lateral lobe is barely longer than the ventral one; it is trifid.

Remarks: The Villány specimen fits into the wide variation trend of *P. taylori*. It is a "macroconch" specimen (see DOMMERMUES, 1978).

Distribution: *P. taylori* is characteristic for the basal subzone of the Jamesoni Zone in the Euroboreal region. COPE (1991) described specimens from Anatolia, and of the same age.

*Epideroceras beggingensis* SCHLATTER, 1991  
Pl. 14, Pl. 15, figs 1-2.

1984 *Epideroceras* cf. *grande* DONOVAN, 1958 - GÉCZY, p. 191.

1989 *Epideroceras* (*Epideroceras*) cf. *lorioli* (HUG) - DOMMERMUES & GÉCZY, p. 25, pl. II, figs 1-2.

1991 *Epideroceras beggingensis* nov. sp. - SCHLATTER, p. 66, pl. 16, Fig. 1, figs 77-78.

Material: 2 specimens from Somssich Hill, collected in 1970.

Dimensions: D = 213 mm

H = 75 mm (35%)

W = 35 mm (18%)

U = 80.5 mm (38%)

Description: Two large moulds of medium preservation. The larger specimen is more than 230 mm in diameter. The excentrically widening umbilicus deepens stepwise. The umbilical wall is convex, strongly leaning over the umbilical seam. The umbilical edge is rounded. The evenly convex, converging lateral sides gradually turn into the narrow, convex ventral side, without forming a ventral edge. Section of the inner whorl is subcircular, the subsequent ones are narrow oval. Maximum width is at the umbilical edge. There is dense, straight ribbing on the internal whorl of the larger specimen. The subsequent, penultimate whorl bears no ornamentation, possibly due to poor preservation. The posterior half of the last whorl displays no ornamentation. The anterior

half is ornamented by slightly projected, gradually stronger, irregularly spaced swells, indistinct on the ventral third of the lateral side. The inner whorl of the smaller specimen bears strong, the penultimate whorl bears indistinct ribs, turning into very wide swells on the last whorl, restricted to the internal sides. There is no body chamber on either specimens.

The suture line is richly dissected. E has relatively wide body, being barely shorter, than L, which bifurcates very asymmetrically. The outer lateral branch of the main branch of L almost lies in the axis of L. The ventral U is well-developed, strongly asymmetric.

Remarks: Periumbilical swells resemble those of VILLANIA. The excentrically widening umbilicus, the strongly reclining umbilical wall, the strongly compresses section and the less wide L of the suture line suggests relations to *Epideroceras*. The Villány specimens differ from earlier published *Epideroceras* species by their less developed ornamentation.

Species *E. lorioli* has been too widely interpreted (see SCHLATTER, 1991, p. 65). *E. beggingensis* is stratigraphically younger (Jamesoni Zone, polymorphus-brevispina Subzone), than *E. lorioli* (Raricostatium Zone).

Distribution: both specimens were found in Pliensbachian beds.

*Epideroceras* cf. *exhaeredatum* BUCKMAN, 1923  
Pl. 21, figs. 2-3.

1915 *Aspidoceras amplexum* nov. sp. - LÓCZY, p. 428, p. 14, fig. 3, text-figs 143-144.

1931 "*Aspidoceras*" *amplexum* LÓCZY - SPATH, pp. 592, 598.

1971 ?*Epideroceras* sp. juv. - CALLOMON, p. 11.

1984 *Epideroceras* cf. *exhaeredatum* BUCKMAN, 1923 - GÉCZY, p. 191.

Material: 1 specimen from Villány, collected by HOFMANN in 1874.

Dimensions: cannot be given due to poor preservation.

Description: Single whorl fragment of poor preservation. The umbilicus is wide, the umbilical wall is inclined, convex. The umbilical edge is rounded. The lateral sides are almost parallel and flat. The ventral edge is rounded, the ventral part is wide and convex. The whorl section resembles a square with rounded edges. Maximum width is near the umbilical edge. The lateral side of the whorl is ornamented by straight, more-or-less radial, narrow ribs arising at the umbilical seam. These bear a minor node near the umbilical edge and a major one at the ventral edge. Ribs occur irregularly. There are 6 ribs on a quarter whorl. The ribs are subdivided to several, indistinct secondary ribs at the ventral nodes, and cross the ventral part.



The suture line is richly dissected.

Remarks: The label tells that LÓCZY called the specimen *Aspidoceras infranodosum* originally. Concerning *Euspidoceras* SPATH was the first to indicate the uncertain systematic position of "*Aspidoceras amplexus*". It is due to CALLOMON that the type specimen, preserved in the Hungarian Geological Institute, was recognised to belong to the Eoderoceratidae family. Also he indicated the similarity between *Epideroceras exhaeredatum* BUCKMAN, 1925 (his pl. 441) and the Villány fragment. The similarity of form and ornamentation is truly surprising, but poor preservation prevented us from more precise determination.

Distribution: BUCKMAN has described *E. exhaeredatum* from the *defluxum* hemera, which belongs to the uppermost part of Raricostatum Zone, according to the revision of DEAN et al. (1961, p. 458). A variety of *E. exhaeredatum* occurs in Turkey (see OTKUN, 1942, p. 32, pl. 2, fig. 1).

*Epideroceras defluxum* BUCKMAN, 1923  
Pl. 15, fig. 3.

1915 *Perishinctes* nov. sp. indet. - LÓCZY, p. 172, pl. X, fig. 9.

1984 *Epideroceras* cf. *exhaeredatum* BUCKMAN - GÉCZY, p. 191.

1989 *Epideroceras* (*Epideroceras*) cf. *lorioli* (HUG) - DOMMERGUES & GÉCZY, p. 25, Pl. II, figs. 2-4 (non 1-2).

1991 *Epideroceras defluxum* BUCKMAN - SCHLATTER, p. 66, figs 77-78, pl. 16, fig. 1.

Material: 1 specimen, collected by HOFMANN in 1874. Hungarian Geological Institute: No. J. 116.

Dimensions: cannot be given due to poor preservation.

Description: A single, chambered whorl fragment, partly with shell preserved, mostly filled by calcite crystals. Whorl section is high oval. Maximum height is 37 mm, width is about 25 mm. The umbilical wall is high, convex, slightly inclined above the umbilical seam. The umbilical edge is rounded. The slightly convex lateral sides gradually turn into the evenly rounded ventral part. Whorls have maximum width at the inner third of the side. Ribs arise at the umbilical seam, they swell at the umbilical edge, become slightly undulating on the sides, being still radial. The ribs are indistinct near the ventral part. There can be seen indistinct swells on the internal mould under proper illumination. A quarter whorl bears about 8 ribs.

The suture line is very dissected. E is long and narrow, L has narrow body, bifurcates asymmetrically. Umbilical elements turn towards the tip of L.

Remarks: Preservation of the specimen resembles that of the *Phylloceras* cf. *hebertinum* mould collected in the lower part of the Carixian bed at Somssich Hill. Lithology and morphology suggests that the specimen is from the Carixian beds.

Whorl section, ornamentation and suture line of the *E. defluxum* specimen is identical to those of the type. Ribs of *E. hugi* DONOVAN, 1958 are wider, and the section is different. Section of *E. lorioli* HUG, 1899 is similar, but secondary ribs cross the ventral part. Unification of the three species is not well founded (see SCHLATTER, 1991, p. 65).

BUCKMAN assigned *Epideroceras defluxum* to the "*defluxum* hemera" (uppermost part of Raricostatum Zone). SCHLATTER described a single specimen of *E. defluxum* from Aselfingen (Switzerland), from the uppermost Sinemurian (Raricostatum Zone, Aplanatum Subzone). According to him, the species was found in the Causses, too, in the lower half of the *Apoderoceras* cf. *tardarmatum* horizon.

*Epideroceras grande schlatterii* n. subsp.  
Pl. 16, Pl. 17, fig. 1.

Type: Number J. 1177 (Department of Palaeontology, Eötvös University, Budapest).

Locus typicus: Villány, Templom Hill

Stratum typicum: yellowish gray limestone (Jamesoni Zone).

Derivatio nominis: After R. SCHLATTER, Professor in Schaffhausen.

Material: 1 specimen.

Dimensions: D = 251 mm

H = 65 mm (26%)

W = 50 mm (20%)

U = 135 mm (53%)

Diagnosis: Proverse primary ribs, narrower than the spaces between them, slightly swelled at the umbilical and ventral margins.

Description: A single large mould of medium preservation; there are traces of preserved shell. The anterior quarter of the last whorl is probably the body chamber. The type is ornamented by narrow, blunt primary ribs, slightly swelled, looking like nodes, at the umbilical and at the ventral margins. At 160 mm diameter there are barely observable secondary ribs on the venter. There are 30 primary ribs on the last whorl. Venter of the last whorl bears no ornamentation.

Whorl section is high-oval, maximum width is near the umbilical edge.

The suture line cannot be studied.

Remarks: Dimensions are equal to those of *Epideroceras grande*, described by DONOVAN (1958, p. 38, pl. 3, figs 1a-b, text-fig. 7). Rib density is similar, too, but the primary ribs better preserved the ancient bituberculate state.

Distribution: The nominate subspecies has been described by DONOVAN from the Raricostatum

Zone of Langeneckgrat (Median Prealps). The new subspecies - labelled by the collector as "Trias" - is younger than the nominate subspecies.

*Coeloderoceras ponticum* (PIA, 1913)  
Pl. 17, figs 2-4.

- 1913 *Coeloceras ponticum* PIA, p. 353, pl. 15, fig. 2.  
1987 *Epideroceras (Coeloderoceras) ponticum* (PIA) -  
DOMMERMUES, p. 92, pl. 3, figs 3-6, Pl. 4, figs 1-16  
(cum syn)  
1989 *Epideroceras (Coeloderoceras) ponticum* (PIA) -  
DOMMERMUES & GÉCZY, p. 24, pl. 1, figs 3-7.  
1991 *Coeloderoceras ponticum* (PIA) - COPE, p. 310, Pl.  
4, fig. 17.

Material: 1 specimen, collected in 1970.

Dimensions: D = 95 mm (measured on an inner whorl)

H = 34.1 mm (35.8%)

W = 30 ? mm (31.5% ?)

U = 37.9 mm (39.9%)

Diagnosis: Narrow venter, swelled internal ribs, symmetrically triphyllid L.

Description: A single, well-preserved, incomplete mould. The wide umbilical narrows in the last whorl. The convex umbilical wall slightly leans over the umbilical seam. The umbilical edge is rounded. The lateral sides are slightly convex, gradually turning into a narrow, high, rounded venter, without forming a ventral edge. Section of the internal whorl resembles a square with rounded edges. Section of external whorls is narrow, oval, maximum width is at the inner third of the side. The internal whorl is ornamented by strong, straight, radial ribs, forming a node-like swelling near the umbilicus and the umbilical seam of the next whorl. There are 8 ribs to the quarter whorl. The penultimate whorl is ornamented by swelled ribs. Some of them are single, while others are slightly swelled beyond the ventral third of the side, and bifurcate to secondary ribs identically thick, as the primary rib. There are intercalatory ribs on the ventral quarter of the side. All ribs are inclined anteriorly, when crossing the venter. There are 18 ventral ribs to a quarter whorl. The last whorl is wide, bearing wide, barely swelled ribs, visible near the umbilicus only. The body chamber has not been preserved.

The suture line is richly dissected. E is slightly shorter than the L; the latter has wide body and is symmetrically triphyllid. Its tips terminate almost in the same line. The ventral U is relatively well-developed. Its internal axis is perpendicular to the axis of L.

Remarks: The Villány specimen has been determined by DOMMERMUES, emphasizing its palaeobiogeographical significance.

Distribution: The *C. ponticum* has been described by PIA from Anatolia. The species - restricted to the northern margin of Tethys - besides Villány

occurs in the Subbriannonnais zone of the Western Alps (Le Môle, Haute Savoie), in the middle part of Jamesoni Zone (Brevispina Subzone).

Genus *Villania* TILL, 1909

Type species: *Villania densilobata* TILL, 1911, p. 67, pl. 7, figs 6-10, T. 8, figs 1-2, by original designation.

The systematic position of the only new genus described now from Villány has been subject to debates for a long time. TILL (1911, p. 69) considered *Villania* as successor to *Hammatoceras*. According to DOUVILLÉ (1912, p. 112) it is a *Proplanulites*. LÓCZY (1915, p. 423) regarded it as *Perisphinctes*, or a subgenus of it. ARKELL (1956, p. 191) made a new subfamily (Villanininae) of it within family Lytoceratidae. CALLOMON (1971, p. 12) was the first to recognise that *Villania* belongs to family Eoderoceratidae. CALLOMON also called the attention upon the fact that *Villania* is close to *Apoderoceras* and *Epideroceras*. According to HOFFMANN (1982, p. 161) in 1884 QUENSTEDT has recognised the difficulties in determining the specimens of "Rohkiegisen Armaten" (= *Apoderoceras*, *Epideroceras*, *Hyperderoceras*, and *Tetraspidoceras*) due to the presence of "transitional forms". ALKAYA (1982, p. 83) and WIEDMANN (1977, p. 56 and 1980, p. 170) considered *Villania* as an independent genus, while DOMMERMUES (1987, p. 101) assigned *Villania* to *Epideroceras* as a subgenus. In 1991 SCHLATTER outlined *Apoderoceras* (p. 62) and *Epideroceras* (p. 64).

Morphological and palaeobiogeographical aspects suggest, that *Villania* is an independent genus.

*Villania* is large, has subcircular whorl section, regularly ribbed internal whorls with less developed nodes, and strong periumbilical swellings ("stumpfe wulstartige Nabelknoten" in TILL, 1909, p. 194) on the external whorl. The suture line is richly dissected.

*Villanias* lived in the Early Pliensbachian Jamesoni Zone along the southern margin of the Eurasian continent, ranging from the Western Alps (Chablais) as far as the Pontides (DOMMERMUES & GÉCZY, 1989, p. 22). There are no records of the genus from either the Northwest European, or the Mediterranean provinces.

*Villania densilobata* TILL, 1909  
Pl. 18.

- 1909 *Villania densilobata* nov. sp. - TILL, p. 194.  
1911 *Villania densilobata* nov. sp. - TILL, p. 67, pl. 7,  
figs 6-10, pl. 8, figs 1-2  
1956 *Villania densilobata* TILL - ARKELL, p. 196, pl.  
227, figs 3a-c.



1971 *Villania densilobata* TILL, 1909 - CALLOMON, p. 12.

1984 *Villania densilobata* TILL, 1909 - GÉCZY, 1984, p. 191.

Non:

1915 *Perisphinctes densilobatus* TILL - LÓCZY, p. 422, pl. 8, fig. 12, pl. 10, fig. 10, pl. 13, fig. 9.

1928 *Perisphinctes densilobatus* TILL - STEFANINI, p. 67, pl. 11, fig. 4.

1939 *Perisphinctes (Villania) densilobata* TILL - KUHN, p. 519, pl. 7, fig. 7.

Typus: Senckenberg Museum, Frankfurt a. M., SMF XI 107 (CALLOMON, pers. comm.)

Dimensions (according to TILL):

D = 207 mm

H = 68 mm (33%)

W = 67 mm (32%)

U = 83 mm (40%)

Description: The original description and figures illustrate a large form with gradually widening umbilicus, convex sides, rounded venter, subcircular whorl section, where maximum width is in the middle of the side. The straight, radial, rounded ribs bear first less developed external, then well-developed external and internal nodes. The ribs form several secondary ribs on the venter. Then the ribs are substituted by periumbilical swellings, reaching their greatest height near the umbilical wall. Here the venter lacks ornamentation. This ornamentation persists as far as the chambered last whorl. The body chamber is unknown.

The suture line - as the name suggests - is extremely richly dissected. E is somewhat shorter, than L, which has narrow body, and is asymmetrically bifurcate. The ventral U is less developed. The umbilical element next to the umbilical seam is perpendicular to the axis of L, and is strongly reduced.

Collecting in 1969 yielded another, fragmented specimen of *V. densilobata* from the classical locality at Villány. This specimen from Templom Hill displays greater dimensions (D = 261 mm) than the type. The mould, partly with shell, lacks the body chamber. The phragmocone is ornamented by slightly projected, wide, rare swells.

Remarks: CALLOMON studied the type in the Senckenberg Museum; he considers the original description and figures as correct. The external whorl and the suture line is almost identical to those of the smooth *Apoderoceras lobulatum* group, while the internal whorl is similar to that of *Epideroceras exhaeredatum* BUCKMAN, "*Deroceras*" *retusum* (SIMPSON), and *D. validum* (SIMPSON). SCHMIDT-EFFING (1972, p. 52) assigned the two latter species to genus *Coeloderoceras*. Ribs of *C. validum* are rarer than those of *Villania*, and bear strong nodes. Ribs of *C. retusum* and of *Epideroceras*

*exhaeredatum* are much more irregular, than those of *V. densilobata*, and whorl section is different, too: *C. retusum* has trapezoidal - like *Apoderoceras* -, while *E. exhaeredatum* has oval. Both internal and external whorls of *Villania* differ from the forms published from the Northwest European province. Some of the "*Villania*", published by LÓCZY, are *Perisphinctes*, like several species described from the Callovian.

Distribution: On the basis of the new collecting, the Pliensbachian age of *Villania densilobata* cannot be questioned anymore.

*Villania densilobata* TILL, 1909 n. subsp.

Pl. 19, figs 1-2.

Material: 1 specimen from Templom Hill, eastern end of the quarry, collected in 1969.

Dimensions: cannot be given due to incomplete preservation.

Description: A single, large (D > 280 mm) mould of poor preservation. Whorls do not display distinct umbilical or ventral edges. Sides are convex, the venter is uniformly convex. Whorl section is circular, at the maximum diameter it is wide elliptical. Maximum width at the middle of the lateral side. There are strong, straight swellings on the internal whorl, swelled near the umbilicus and the ventral third of the side. Both external and internal swells become indistinct on the last whorl; only the rare, wide swells ornamenting the internal half of the side persist. The body chamber is missing.

The suture line cannot be studied in detail due to poor preservation.

Remarks: The Villány specimen differs from the nominate subspecies of the type by a much wider umbilicus and better developed swells extending as far as the middle of the side. Naming the new subspecies would be too early due to the incomplete preservation.

Distribution: The specimen was found in the eastern part of the quarry, immediately below the Callovian ammonite bed.

*Villania rollieri* (LÓCZY, 1915)

Pl. 20, Pl. 21, fig. 1.

1915 *Aspidoceras Rollieri* nov. sp. - LÓCZY, p. 430 (partim), pl. 9, fig. 7 (non: pl. 14, figs 4, 9).

1922 *Aspidoceras rollieri* LÓCZY - ROLLIER, p. 360.

1931 "*Aspidoceras*" *rollieri* LÓCZY - SPATH, p. 539.

1956 "*Aspidoceras*" *rollieri* LÓCZY - ARKELL, p. 191.

1971 ? *Epideroceras rollieri* (LÓCZY, 1915) - CALLOMON, p. 11.

Material: 1 specimen, collection of the Hungarian Geological Institute: J. 820 (= Lóczy, pl. 9, fig. 7).

Dimensions: D = 215.2 mm

H = 78 mm (36.2%)

W = 83.6 mm (38.8%)

U = 80.3 mm (35.9%)

Description: A single, large mould of medium preservation. The umbilicus is narrow and deep. The evenly convex sides do not form umbilical or ventral edges. Whorl section is wide-oval, maximum width is at the internal third of the side. The internal whorl bears straight, dense, almost identical ribs. There are posteriorly inclined ribs on the penultimate whorl. Some ribs bear node-like swellings. On the last whorl the ribs are less dense, and turn into posteriorly inclined swells. Swells are stronger on the periumbilical and on the ventral third of the side. There are 25 swells on the last whorl. External ribs can still be observed on the posterior part of the last whorl, then disappear gradually.

The suture line cannot be studied.

Remarks: LÓCZY published 3 specimens under the name *Aspidoceras rollieri*. CALLOMON selected pl. 9, fig. 7 as lectotype. LÓCZY considered *A. rollieri* one of the rarest and most special form ("Eine der seltensten und absenderlichen Formen...") of the Villány fauna. ROLLIER cited this specimen, when discussing *Clambites*. SPATH considered it as a new genus first, being a transition between *Aspidoceratinae* and the persistent *Lytoceras* branch. The similarity with *Lytoceras* was indicated by LÓCZY, while ARKELL assigned it to a new *Lytoceras* genus, together with *Villania densilobata*. SPATH questioned the Callovian age of "*A.*" *rollieri*. CALLOMON was the first to recognise that *A. rollieri* belongs to the *Eoderoceratidae*; he assigned the lectotype conditionally to *Epideroceras*. The whorl section and ornamentation is rather characteristic for *Villania*. *V. rollieri* is distinguished from other *Villania* species by the slightly posteriorly inclined ribs, and the swells, which are much thicker, than the space between them.

Distribution: *V. rollieri* is solely known from Villány, from the Pliensbachian, as indicated by the sediment fill of the mould.

*Villania kopeki* n. sp.  
Pl. 22.

1984 *Villania* n. sp. - GÉCZY, p. 191.

1989 *Epideroceras* (*Villania*) gr. *densilobata*, morphotype (?) évolutive - DOMMERMES & GÉCZY, p. 27, Pl. 4, figs 1-2.

Type: pl. 22.

Locus typicus: Villány, Templom Hill.

Stratum typicum: yellowish grey limestone (Jamesoni Zone).

Derivatio nominis: after dr. Gábor KOPEK, geologist, who collected the specimen.

Material: 1 specimen.

Dimensions: D = 209.6 mm

H = 64.9 mm (31%)

W = 50.4 mm (24.1%)

U = 92.0 mm (44%)

Diagnosis: Suboval external whorl, strong proverse primary ribs, with 2 nodes.

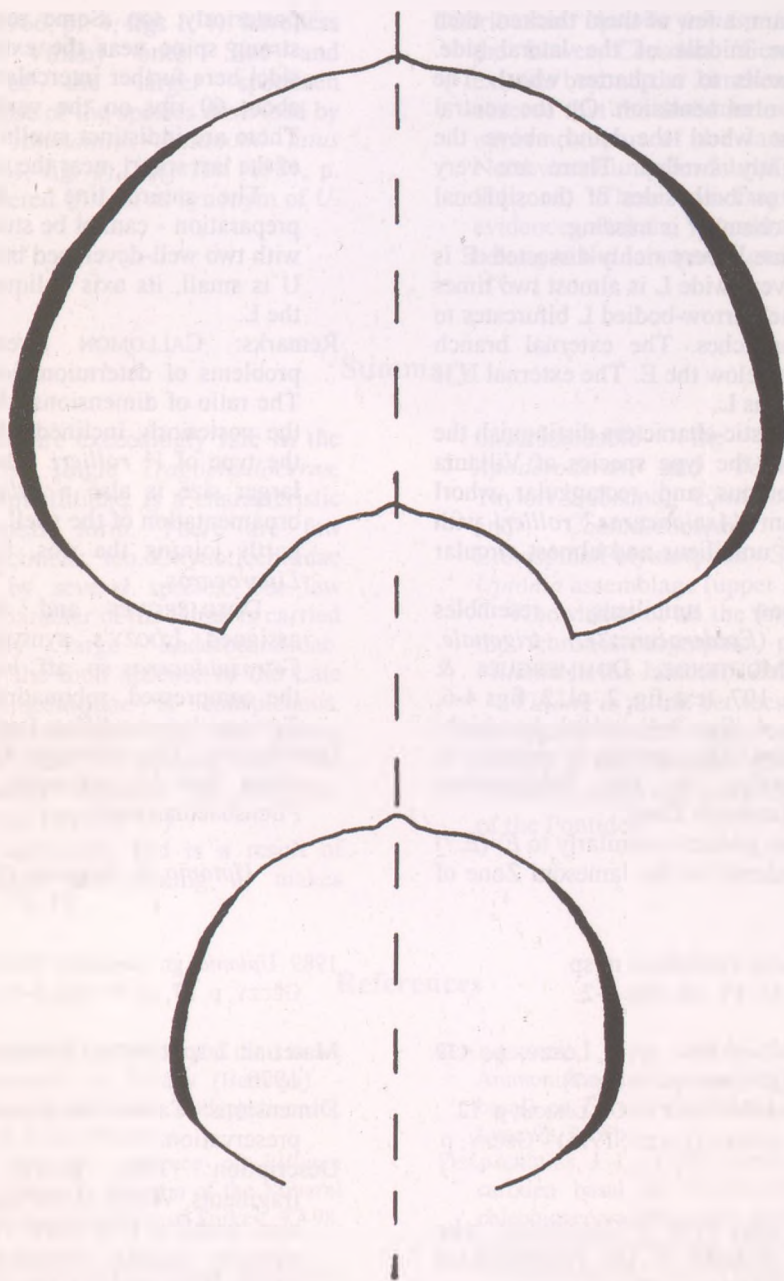
Description: A single, large mould of medium preservation, partially filled by calcite. The umbilicus is wide, stepwise deepening. The umbilical edge is rounded. The internal whorls bear flat, almost parallel sides. The umbilical edge is rounded in the internal whorls; on the last whorl the sides gradually turn into the high, convex venter. The section of the internal whorls resembles a rounded square, then a rounded oblong rectangle. Section of the last whorl is suboval. Maximum width is near the umbilicus. Ornamentation is well developed. The internal whorls are ornamented by strong, straight, slightly proverse ribs, appearing at the umbilical edge, and bearing a node-like swell near the umbilical edge on internal whorls. On the penultimate whorl the ribs are most swelled near the umbilical edge. On the last whorl there are less ribs, which bear strong node. The internal nodes are near the umbilical edge, the external ones are in the external third of the side. The internal nodes are elongated parallel to the ribs, while the external nodes are almost circular. There are secondary ribs intercalated between the primary ribs on the external side, becoming as thick as the narrowed primary ribs of the venter. There are about 12 ribs within 3 primary ribs on the venter. All external ribs are proverse, a quarter of a whorl bears 6 internal ribs, increasing to 8 on the two last whorls. The body chamber is missing.

The suture line is extremely richly dissected, deeply retracted, with an umbilical element perpendicular to the axis of L.

Remarks: The new species is distinguished from *Villania densilobata* by the characters listed in the diagnosis. The dense, straight, well-developed internal ribs are identical with those of the type. The internal whorl and the suture line justifies assigning *V. kopeki* to the genus *Villania*, even if the section and double node row of the last whorl resembles those of *Tetraspidoceras quadrarmatum*. The intercalatory ribs of the same length as the primary ribs, characteristic for *Tetraspidoceras*, are missing on *V. kopeki*.

Distribution: The specimen of *V. kopeki*, preserved in the Hungarian Geological Institute has a label indicating its appearance in the Callovian bed. The calcite-filled internal whorls display the same preservation features as all other Pliensbachian ammonites of the same locality. The sediment fill corroborates taxonomic assignment: the new species was found in the layer underlying the ammonites bed.



Text-fig. 4. *Villania galaczi* n. sp. whorl section. Actual size.

*Villania galaczi* n. sp.  
Text-fig. 4, Pl. 23, Pl. 24.

Type: Pl. 23-24.

Locus typicus: Villány, Somssich Hill.

Stratum typicum: grey, compact limestone (Jamesoni Zone).

Derivatio nominis: after the collector, Professor A. GALÁ CZ.

Material: 1 specimen, collected in 1970.

Dimensions: cannot be given due to incomplete preservation.

Diagnosis: Narrow umbilicus, rapidly growing, kidney-shaped whorl section, swelled siphonal part.

Description: A single, well-preserved, but incomplete mould. Rarely the shell is preserved. The umbilicus is narrow and deep. The very convex sides, leaning over the umbilical seam, do not form either umbilical or ventral edge. The venter is wide, high, convex. Whorl section is kidney-shaped. Height is 85.2% of width. Maximum width is at the internal third of the side. There are dense, straight, radial ribs in the internal whorl, slightly higher on the internal third of the side. Internal side of the penultimate whorl bears wide, more or less irregular swells. There are radial, indistinct, relatively dense ribs, wider than the space between them. There are very well developed, radially elongated swells on the internal side of the last whorl, originating near

the umbilical seam; a few of them thicken, then disappear at the middle of the lateral side. There are 7 swells to a quarter whorl. The venter bears no ornamentation. On the ventral side of the last whorl the band above the siphone is slightly swelled. There are very shallow furrows on both sides of the siphonal swell. The body chamber is missing.

The suture line is very richly dissected. E is very short. The very wide L is almost two times as long as E. The narrow-bodied L bifurcates to perpendicular branches. The external branch extends as far as below the E. The external U is about half in size as L.

Remarks: The diagnostic characters distinguish the new species from the type species of *Villania* with wide umbilicus and rectangular whorl section, and from "*Aspidoceras*" *rollieri* with somewhat wider umbilicus and almost circular whorl section.

The narrow umbilicus resembles *Epideroceras* (*Epideroceras*?) *trigonale*, described by MOUTERDE, DOMMÉRGUES & ROCHA (1983, p. 197, text-fig. 2, pl. 2, figs 4-6, pl. 3, fig. 2, pl. 4, figs 3-4), which has high-oval whorl section. This species is endemic to Portugal, occurring in the Polymorphus Subzone of the Jamesoni Zone.

Distribution: *Villania galaczi* - similarly to *E. (E.?) trigonale* - is endemic to the Jamesoni Zone of Villány.

*Villania callomoni* n. sp.  
Pl. 25, Pl. 26, figs 1-2.

1915 *Aspidoceras rollieri* nov. sp. - LÓCZY, p. 430 (partim), pl. 14, fig. 4, non: pl. 9, fig. 7).

1971 "*Aspidoceras*" *rollieri* LÓCZY - CALLOMON, p. 12.

1984 *Villania* sp. aff. *rollieri* (LÓCZY, 1915) - GÉCZY, p. 191.

Derivatio nominis: after Prof. J. CALLOMON, who made the first revision of the Pliensbachian ammonites of Villány.

Material: 1 specimen, collection of the Hungarian Geological Institute, No. J. 119.

Dimensions: D = 158.2 mm

H = 67.7 mm (40.2%)

W = 65.4 mm (40.1%)

U = 51.2 mm (32.4%)

Diagnosis: circular whorl section, narrow, dense, rectiradiate ribs.

Description: A single, large specimen, parts of the shell preserved. The umbilicus is narrow and deep. The evenly convex sides do not form either umbilical or ventral edge. Whorl section is circular; maximum width is at the middle of the lateral side. The penultimate whorl is ornamented by very short, posteriorly inclined, straight primary ribs, bearing a node-like swelling near the umbilicus. Straight, dense secondary ribs arise at the nodes, usually three together. The secondary ribs are inclined

posteriorly, too. Some secondary ribs bear a strong spine near the external quarter of the side; here further intercalatory ribs arise. There are about 60 ribs on the venter to a half whorl. There are indistinct swells on the anterior part of the last whorl, near the umbilicus.

The suture line - due to the strong preparation - cannot be studied well. L is wide, with two well-developed branches. The external U is small, its axis obliquely inclined towards the L.

Remarks: CALLOMON already indicated the problems of determination of this specimen. The ratio of dimensions, the whorl section and the posteriorly inclined ribs are all similar to the type of *V. rollieri*. The umbilical swell at larger size is also a *Villania* character. The ornamentation of the shell, bearing a node row, partly joining the ribs, is similar to that of *Liparoceras*.

DOMMÉRGUES and the author (1989) assigned LÓCZY's syntype conditionally to *Tetraspidoceras* sp. aff. *morogensis*. However, the compressed, subquadratic whorl section of *Tetraspidoceras* differs from that of *Villania*.

Distribution: The sediment fill indicated beyond doubt that *V. callomoni* was found in the Pliensbachian beds.

*Uptonia* cf. *jamesoni* (SOWERBY, 1827)  
Pl. 27.

1989 *Uptonia* gr. *jamesoni* (Sow.) - DOMMÉRGUES & GÉCZY, p. 27, pl. IV, figs 3-4.

Material: 2 specimens, Somssich Hill. Collected in 1970.

Dimensions: Cannot be given due to incomplete preservation.

Description: Two, poorly preserved mould fragments. Whorl of the smaller specimen is 43 mm, width is 27.5 mm. The lateral side bears straight, slightly forward inclined, simple, strong, rare ribs. At the ventral edge the ribs are swelled and - arched forward - cross the venter. There are about 12 ribs to a quarter whorl.

Whorl height of the larger specimen is up to 55 mm! Width cannot be measured precisely, but it is relatively greater than on the smaller specimen. Ribs are much swelled, inclined forward, and bent forward on the venter. There are about 19 ribs on the last half whorl.

Internal whorls are missing on both specimens, and suture lines cannot be studied.

Remarks: Despite incomplete preservation both specimens certainly belongs to *Uptonia*. Ornamentation indicate *U. jamesoni*, although ribs are somewhat rarer than on the prototype designated by DONOVAN (1973, p. 12, pl. 4, figs 3a-b). Rib density and whorl section varies widely. Specimens of *U. jamesoni* described from the West Carpathians (see KOLLÁROVÁ-



ANDRUSOVÁ, 1966, pl. 4, figs 1, 4). have less ribs than the Villány ones. Size and ornamentation of the larger specimen corresponds to those of the species described by QUENSTEDT as *Ammonites jamesoni latus* (1845, p. 88, Pl. 4, fig. 1), MEISTER (1984, p. 64) rightly considered *U. lata* as synonym of *U. jamesoni*.

Distribution: *Uptonia jamesoni* is a zonal index of the Lower Carixian. Genus *Uptonia* never extends beyond the Jamesoni Zone. One should observe that the zonal index is restricted to the uppermost part of the Jamesoni Zone in the Northwest European faunal province (Jamesoni Subzone). These two fragments are decisive evidences, that the "Cornbrash" beds of Villány belong to the Jamesoni Zone.

## Summary

Phylloceratidae are exceedingly rare in the Villány fauna. The single *Tragophylloceras*, belonging to Juraphyllitidae, is a characteristic Northwest European form. There are few Lytoceratidae specimens, too. Oxynoticeratidae are represented by several species, but few specimens. The character of the fauna is carried by the usually large Eodoceratidae. Chronologically the total absence of the Late Sinemurian Echioceratidae is conspicuous. *Tropidoceras*, characteristic for the Lower Sinemurian Ibx Zone, is missing, too. The fauna unequivocally indicates the Jamesoni Zone (see MEISTER, 1995, p. 79).

Possibly the ammonite bed is a result of faunal condensation and mixing. It makes

understandable the co-occurrence of *Apoderoceras* and *Tetraspidoceras* (both Taylori Subzone), *Epideroceras beggingensis* and *Coeloderoceras ponticum* (both Brevispina/Polymorphus Subzone), and the *Uptonia* assemblage (upper Jamesoni Subzone).

Knowledge of all the fauna helps to identify the chronostratigraphic position of genus *Villania* in the Jamesoni Zone.

*Villány* is a link between terranes now lying far apart, which have been adjoint to the margin of the European plate: Subbriançonnais (Western Alps) and the middle and eastern part of the Pontides.

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Figs 1-2. *Phylloceras* cf. *hebertinum* (REYNÉS, 1868). Figs 3-4. *Partschiceras* cf. *striatocostatum* (MENEGHINI, 1853). Fig. 5. *Lytoceras* cf. *fimbriatum* (SOWERBY, 1817)





*Tragophylloceras numismale* (QUENSTEDT, 1845)





*Radstockiceras* cf. *involutum* (POMPECKJ, 1907)



## Plate 4



Figs 1-2. *Radstockiceras* cf. *involutum* (POMPECKJ, 1907). Figs 3-5. *Radstockiceras* cf. *buvignieri* (D'ORBIGNY, 1844). Fig 6. *Radstockiceras* cf. *evolutum* (FUCINI, 1901)





Figs 1-2. *Hyperderoceras retusum* (SIMPSON, 1855)  
Fig 3. *Tetraspidoceras ? loczyi* n. sp. (Type)





*Tetraspidoceras ? loczyi* n. sp. (Type)

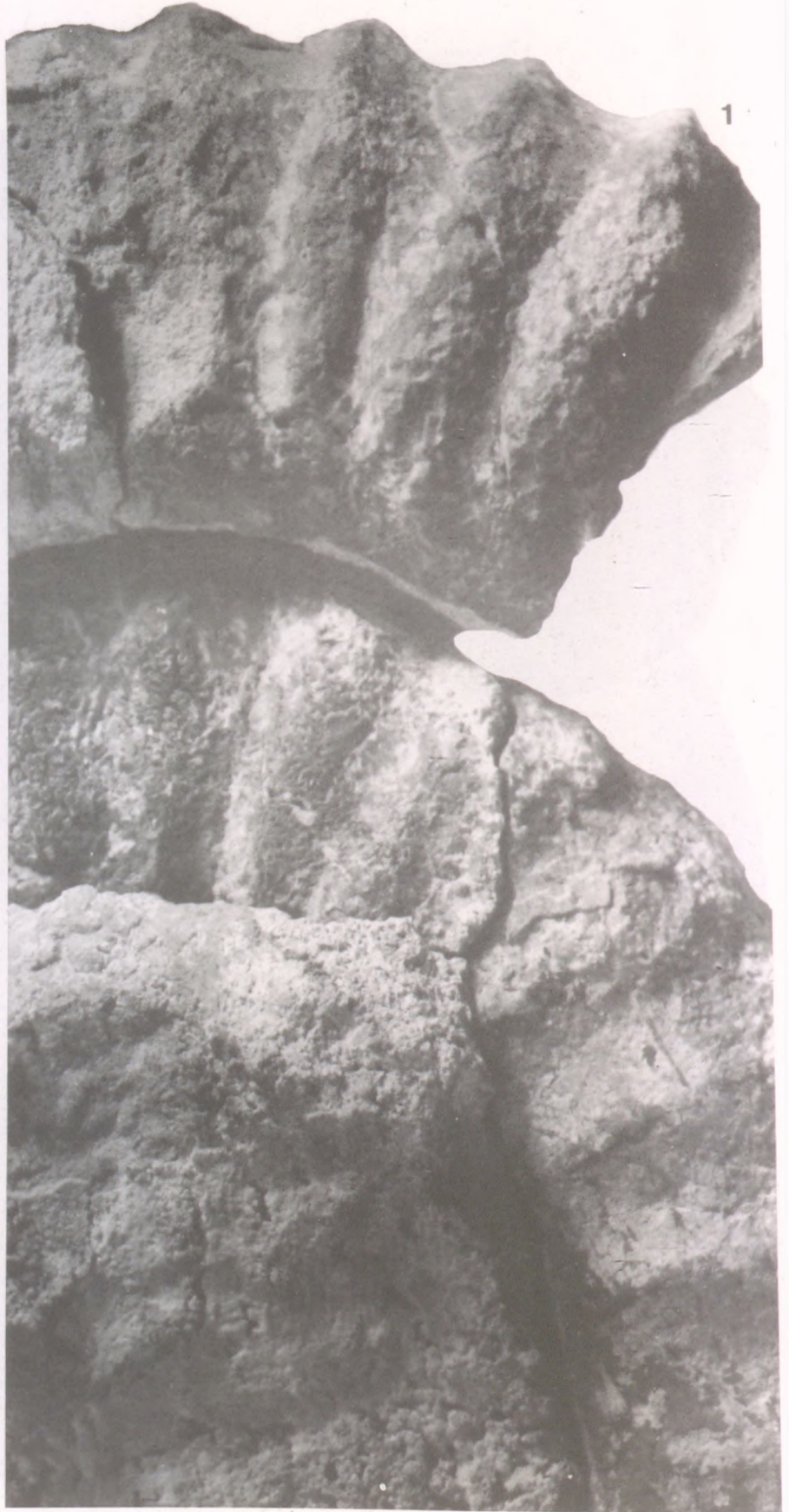




Figs 1-2. *Tetraspidoceras* ? cf. *loczyi* n. sp.



Plate 8



Figs 1-2. *Tetraspidoceras ? loczyi* n. sp.





Figs 1-2. *Tetraspidoceras ? loczyi* n. sp.



*Tetraspidoceras ? loczyi* n. sp.





*Tetraspidoceras ? loczyi* n.





Figs 1-3. *Apoderoceras antiquum* (LÓCZY, 1915)





Figs 1-4. *Phricodoceras taylori* (SOWERBY, 1826)





*Epideroceras beggingensis* SCHLATTER, 1991





Figs 1-2. *Epideroceras beggingensis* SCHLATTER, 1991  
Fig. 3. *Epideroceras defluxum* BUCKMAN, 1923





*Epideroceras grande schlattereri* n. subsp. Type





Fig. 1. *Epideroceras grande schlattereri* n. subsp.  
Figs 2-4. *Coeloderoceras ponticum* (PIA, 1913)





*Villania densilobata* TILL, 1909





Figs 1-2. *Villania densilobata* TILL, 1909, nov. subsp.





*Villania rollieri* (LÓCZY, 1915) Type.



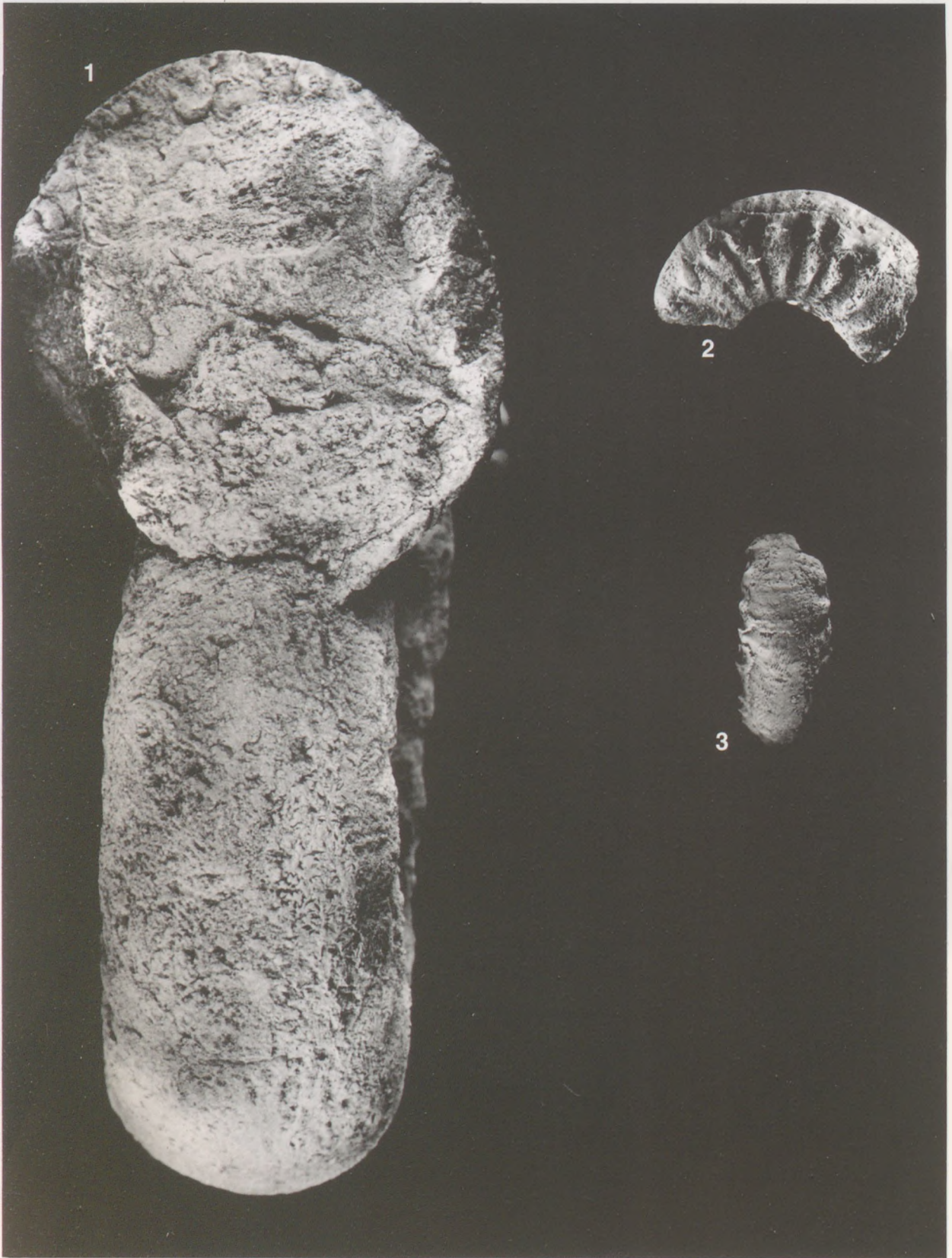


Fig. 1. *Villania rollieri* (LÓCZY, 1915) Type.  
Figs 2-3. *Epideroceras* cf. *exhaeredatum* BUCKMAN, 1923





*Villania kopeki* n. sp. (Type)





*Villania galaczi* n. sp. (Type)





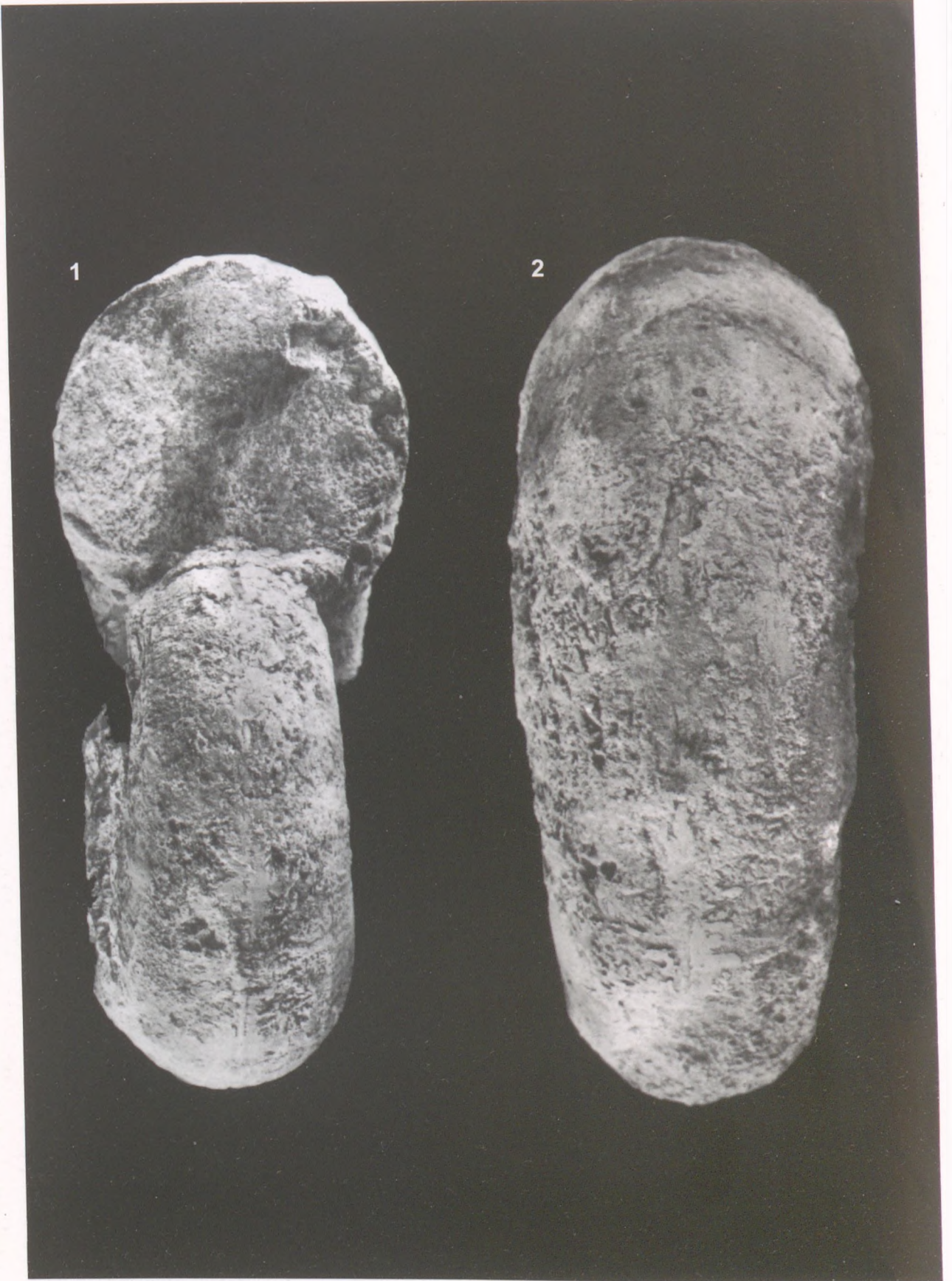
*Villania galaczi* n. sp.





*Villania callomoni* n. sp.





Figs 1-2. *Villania callomoni* n. sp.





Figs 1-3. *Uptonia jamesoni* (SOWERBY, 1827)