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CORALS OF THE TRAVERSE GROUP OF MICHIGAN  
PART VII, THE DIGONOPHYLLIDAE

BY  
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MUSEUM OF PALEONTOLOGY  
THE UNIVERSITY OF MICHIGAN  
ANN ARBOR

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8. Middle Ordovician Black River Ostracods from Michigan. Part IV. Species of *Colacchilina* (New Genus), *Laccochilina*, and *Hesperidella*, by Robert V. Kesling, Donald D. Hall, and James C. Melik. Pages 205-213, with 2 plates.
9. Corals of the Traverse Group of Michigan. Part VII, The Digonophyllidae, by Erwin C. Stumm. Pages 215-231, with 6 plates.

CORALS OF THE TRAVERSE GROUP OF MICHIGAN  
PART VII, THE DIGONOPHYLLIDAE<sup>1</sup>

BY  
ERWIN C. STUMM

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INTRODUCTION

PART VII of the study of the corals of the Traverse group of Michigan concerns the Devonian cystimorphs which are placed in the family Digonophyllidae. Two genera *Atelophyllum* and *Lythophyllum* are recognized for the first time in North American strata. Two new species of *Atelophyllum*, one of *Lythophyllum* and five of *Cystiphylloides* are described. Two new subspecies of the common species *Cystiphylloides americanum* (Edwards and Haime) are described.

<sup>1</sup> Part I is published in Vol. VII, No. 8; Part II in Vol. VIII, No. 3; Part III in Vol. VIII, No. 8; Part IV in Vol. IX, No. 3; Part V in Vol. XIV, No. 11; and Part VI in Vol. XVI, No. 4, of the *Contributions from the Museum of Paleontology, The University of Michigan*.

## PREVIOUS WORK

Rominger (1876), Pl. 50, upper tier, placed Traverse group specimens of *Cystiphylloides* in the common species *C. americanum* but the specimen he illustrated from the Four Mile Dam formation is not that species. Rominger also mentioned the presence of *C. aggregatum* (Billings) from the Thunder Bay region but figured no specimens. His specimens are probably representatives of one of the new compound species described in this paper.

## ACKNOWLEDGMENTS

I wish to thank Dr. L. B. Kellum, Dr. C. A. Arnold, and Dr. R. V. Kesling for critically reading the manuscript of this paper. All type specimens illustrated herein are in the Museum of Paleontology, The University of Michigan.

## REGISTER OF LOCALITIES

*Localities:*

13. Abandoned Northern Lime Company, quarry ("Main Curtiss and two smaller quarries" of E. R. Pohl), and shore bluffs to west, Emmet and Charlevoix Counties near village of Bay Shore, SW  $\frac{1}{4}$  sec. 6, T. 34 N., R. 6 W. and SE  $\frac{1}{4}$  sec. 1, T. 34 N., R. 7 W. Charlevoix and Petoskey formations.
14. Quarry of Petoskey Portland Cement Company, about  $1\frac{1}{2}$  miles west of Petoskey, Emmet County, SW  $\frac{1}{4}$  sec. 2, and SE  $\frac{1}{4}$  sec. 3, T. 34 N., R. 6 W. Gravel Point formation, lowermost Charlevoix formation at extreme east end.
- 14e. Abandoned "Bell" quarry and ledges on shore about 2 miles east of Bay Shore, Emmet County, near northeast corner sec. 8, T. 34 N., R. 6 W. (Rose quarry of Fenton and Fenton, 1930). Basal Charlevoix and upper Gravel Point formations.
21. Kegomic quarry on south shore of Mud Lake just east of Harbor Springs road (M. 131) about  $\frac{1}{4}$  mile north of its termination on U.S. 31 one mile east of Bay View, Emmet County, SE  $\frac{1}{4}$  SW  $\frac{1}{4}$  sec. 27, T. 35 N., R. 5 W. Petoskey formation, *G. petoskeyensis* zone and Potter Farm fauna.
30. Exposures along Ocqueoc River at Ocqueoc Falls immediately north of main road (U.S. 23, 1940)  $4\frac{1}{2}$  miles north of Millersburg, Presque Isle County. Just north of south line, sec. 22, T. 35 N., R. 3 E., Rockport limestone.
31. Quarry of Michigan Limestone and Chemical Company at Calcite, Presque Isle County. Site of Crawford's Marble quarry. 10 sections in southeast part T. 35 N., R. 5 E., and adjacent townships. Dundee and Rogers City limestones and lower Bell shale.
35. Bluffs on northeast shore of Partridge Point, 4 miles south of Alpena, Alpena County. Extends from center into SE  $\frac{1}{4}$  sec. 11, T. 30 N., R. 8 E. Thunder Bay limestone, type locality.
38. Abandoned quarry of Kelley's Island Lime and Transport Company (Great Lakes Stone and Lime Company) at Rockport, Alpena County, sec. 6, T. 32 N., R. 9 E., Upper Bell shale, Rockport Limestone, lower Ferron Point shale.

40. Quarry of Michigan Alkali Company, eastern edge of Alpena, Alpena County, Sec. 13, T. 31 N., R. 8 E. Upper Genshaw formation, Newton Creek limestone, Alpena limestone, type locality.
41. Exposures on banks and in bed of Thunder Bay River below Four Mile Dam, Alpena County,  $\frac{1}{4}$  mile south of center, sec. 7, T. 31 N., R. 8 E. Other names currently or formerly applied to this dam site are Fletcher Dam, Three Mile Dam, Broadwell's Saw Mill. Four Mile Dam bioherms, type locality, and Norway Point formation.
53. Quarry of Thunder Bay Quarries Company, eastern edge of Alpena, Alpena County, SE  $\frac{1}{4}$  sec. 14, T. 31 N., R. 8 E. Alpena limestone, Dock Street clay, type section; overlying beds with Four Mile Dam fauna.
55. Cut on private railway of Kelley's Island Lime and Transport Company, about 1 mile south of Bell, Presque Isle County, SW  $\frac{1}{4}$  SW  $\frac{1}{4}$  sec. 24, T. 33 N., R. 8 E. Bell shale, probably near the middle of the formation.
68. Small shale pit at the northwest corner of the Alpena Cemetery (Evergreen Cemetery), Alpena County, SW  $\frac{1}{4}$  sec. 21, T. 31 N., R. 8 E. Potter Farm formation (part of type locality).
76. Low cuts and ditches on Alpena—Long Rapids road about  $\frac{1}{2}$  mile northwest of Norway Point Dam (Loc. 47), Alpena County. Short distance north of center south line sec. 1, T. 31 N., R. 7 E. Four Mile Dam beds and possibly Norway Point formation.
79. Road cut and ditch on "New Shore Road" (new U.S. 23) 1.75 miles east of Swan Creek and 1 mile west of Trout Creek, about 9 miles southeast of Rogers City, Presque Isle County. Approximately  $\frac{1}{4}$  mile east of center sec. 16, T. 34 N., R. 6 E. Lower Ferron Point shales.

*Grabau:*

1. Middle Alpena Limestone. Quarries, northern end of Alpena. SE  $\frac{1}{4}$  sec. 14 (Fox Quarry), SW  $\frac{1}{4}$  sec. 13 (Collins Quarry), T. 31 N., R. 8 E., Alpena County.
28. Genshaw Limestone. Section line between sections 24 and 25, T. 32 N., R. 8 E., northeast corner of Alpena.

SYSTEMATIC DESCRIPTIONS

Phylum COELENTERATA

Class ANTHOZOA

Order RUGOSA

Suborder CYSTIPHYLLINA

Family Digonophyllidae

Genus *Atelophyllum* Wedekind

*Atelophyllum* Wedekind, 1925, p. 37.

*Type species.*—By original designation, *Mesophylloides emsti* Wedekind, 1922, p. 57, Pl. 2, Figs. 1a-b, upper Middle Devonian, Emst, near Hagen, Eifel, Germany.

*Diagnosis.*—Simple, subcylindrical to ceratoid rugose corals with a

bell-shaped calyx. In transverse section major septa continuous or discontinuous in periaxial region. Minor septa may be continuous, or discontinuous septal crests. Peripheral region occupied by dissepiments, axial region typically by distally concave tabulae and tabellae. In longitudinal section dissepimentarium wide, composed of small to large, axially and distally convex dissepiments. Tabularium occupying central one-third of corallum, composed of concave, typically incomplete tabulae and tabellae.

***Atelophyllum subcylindricum* sp. nov.**

(Pl. I, Figs. 9-11; Pl. 4, Figs. 1-2)

*Description.*—Corallum subcylindrical, a complete specimen, the holotype, measuring 10.5 cm in length with an average diameter of about 3 cm. Calyxes bell-shaped; a perfect calyx on a paratype 2.5 cm in diameter with steeply sloping walls and a narrow, flat axial pit 8 mm in diameter.

In transverse section periaxial septa ranging from 70 to 78 in two concentric bands each about 2 mm long. Some septa continuous across outer and inner band, others discontinuous, leaving a small unoccupied area between the bands. All septa relatively thin, tapering axially. In some specimens traces of a third concentric band at the margin of the tabularium is present. These bands represent successive septal cones as is typical of the Digonophyllidae. The peripheral dissepimentarium averages about 5 mm in diameter and is composed of axially convex dissepiments about 2 mm long (parallel to the periphery), and 1 mm wide (at right angles to the periphery). The tabularium shows the intercepted ends of the concave tabulae and a stereozone representing the beginning of a fourth septal cone. In longitudinal section the dissepimentarium occupies the peripheral and periaxial regions and is composed of dissepiments becoming thinner and more elongate as they approach the tabularium. The tabularium is composed of very concave tabulae interspersed with irregularly distributed tabellae and showing vertically discontinuous stereozones representing the beginning of successive septal cones.

*Remarks.*—The species is quite distinct, differing from the genotype species and from the common Australian species *A. fultum* Hill in having much shorter, more nearly discontinuous septa and much more concave tabulae.

*Occurrence.*—Middle Devonian, Traverse group, Bell shale, in all known outcrop areas of the formation in Alpena and Presque Isle Counties.

*Types.*—Holotype No. 35175; Paratypes Nos. 35172 and 35173.

**Atelophyllum magnum** sp. nov.

(Pl. II, Figs. 8-9; Pl. V, Figs. 6-7)

*Cystiphyllum americanum* Rominger. 1876 *partim*, Pl. 50, upper tier, left-hand figure only.

*Description.*—Corallum simple, narrowly ceratoid, large; holotype, the only known specimen, about 7 cm long with a maximum diameter at the margin of the calyx of about 5.5 cm. Exterior with faintly defined, closely spaced annulations. Calyx bell-shaped, with a narrow, sloping peripheral platform, steeply sloping walls, and an axial pit less than 1 cm in diameter filled with distally convex tabellae. Septa prominent from margin of calyx to margin of axial pit. In transverse section septa approximately 90 in number, appearing as two concentric bands in the periaxial region with a maximum length of 12 mm. Some septa continuous from inner to outer band, others discontinuous. Most septa thickened by stereoplasm. Septal zone bounded peripherally and axially by zones of dissepiments ranging from 2 to 6 mm in diameter. Axial area occupied by a stereozone representing the initial stage of another septal cone. In longitudinal section peripheral area represented by medium-sized globose dissepiments. Enlarged dissepimentarium on one side apparently representing the internal structure of an attachment talon. Periaxially, six successive septal cones represented by zones of stereoplasm. Axially, tabularium composed of distally convex tabellae.

*Remarks.*—The species is quite distinct from all other known species of *Atelophyllum*. It approaches the genotype species *A. emsti* in having convex tabellae in the tabularium, but differs in the possession of thickened, more discontinuous septa.

*Occurrence.*—Middle Devonian, Traverse group, Four Mile Dam limestone, locality 41.

*Type.*—Holotype No. 8610.

Genus *Lythophyllum* Wedekind

*Type species.*—By original designation *L. marginatum* Wedekind, 1925, p. 32, text figs. 32-33 on p. 25, Middle Devonian, Untere Stenophyllen-schichten; Dachsberg, near Gerolstein, Eifel, Germany.

*Diagnosis.*—Simple cystiphylloid corals with internal structures resembling those of *Cystiphylloides* except that the tabularium moves progressively peripherally between the neanic and ephebic stages.

**Lythophyllum alpenense** sp. nov.

(Pl. I, Figs. 6-7; Pl. IV, Fig. 3)

*Description.*—Corallum simple, ceratoid, holotype measuring 3.5 cm long and 2.5 cm in maximum diameter. Exterior weathered, calyx not preserved. In transverse section dissepimentarium filled with extremely small globose dissepiments crossed by numerous short, blunt septal crests. Tabularium with margin about 3 mm from the periphery, composed of small tabellae. In longitudinal section dissepiments are elongate and directed axially. The tabulae are relatively small and typically distally convex.

The marginal migration of the tabularium is distinctly visible.

*Remarks.*—The species differs from the genotype species *L. marginatum* in having much smaller dissepiments and smaller tabellae. The septal crests in *L. marginatum* are spinose while those in *L. alpenense* are thick and blunt.

*Occurrence.*—Middle Devonian Traverse group, Genshaw formation, locality 40.

*Type.*—Holotype No. 35213.

Genus *Cystiphylloides* Chapman

*Cystiphylloides* Chapman, 1893, p. 46.

*Type species.*—By monotypy, *Cystiphyllum aggregatum* Billings, 1859, p. 137, text fig. 28, Middle Devonian, Onondaga limestone, near Simcoe, Ontario, Canada.

*Diagnosis.*—Simple phaceloid or subceroid coralla with subcylindrical to ceratoid corallites. Exterior typical with closely spaced expansions caused by calycinal rejuvenescence. Calyxes bell-shaped or funnel-shaped without well-defined peripheral platforms. Interior with a peripheral dissepimentarium filled with globose dissepiments and an axial tabularium filled with globose tabellae. Septal cones degenerate, leaving faintly defined septal crests appearing as short spines in the dissepimentarium. In some species septal crests are lacking.

**Cystiphylloides alpenense** sp. nov.

(Pl. II, Figs. 3-4; Pl. III, Figs. 5-6; Pl. IV, Fig. 11)

Corallum phaceloid or dendroid, loosely aggregate, apparently attached only at bases of corallites. Corallites cylindrical to subcylindrical averaging about 3 cm wide, with rugose exteriors; strongly developed growth annulations spaced at irregular intervals. Calyxes apparently relatively shallow,



bell-shaped. In transverse section dissepimentarium with small dissepiments and strongly developed concentric bands of septal crests. As many as four concentric bands, each from 1 to 2 mm wide, visible in one section. Tabularium composed of small tabellae. In longitudinal section dissepiments small, globose, crossed by invaginated septal cones. Tabellae very small, extremely globose, convex distally.

*Remarks.*—This species most resembles the type species *C. aggregatum* but does not have the attachment talons between corallites characteristic of that species. In addition, the dissepiments of *C. alpenense* are much smaller and the tabellae are also much smaller and are distally convex while those of *C. aggregatum* (Stumm, 1961, Pl. 4, Fig. 3; Pl. 5, Fig. 5) are typically flat or concave.

*Occurrence.*—Middle Devonian, Traverse group, upper part of Alpena limestone, locality 40 and 53, Grabau locality 1; Four Mile Dam limestone, localities 40, 53, and 76.

*Type.*—Holotype No. 44079; paratypes Nos. 44296 and 44297.

### *Cystiphyloides? amalgamatum* sp. nov.

(Pl. III, Figs. 7-8; Pl. V, Fig. 5)

Corallum subcerioid, composed of cylindrical to subcylindrical corallites ranging from 1 to 3 cm in diameter. Exteriors of corallites with strongly developed annulations. Calyxes shallow, saucer-shaped. In transverse section corallites attached with or without connecting walls, dissepiments very large, tabellae relatively small. Boundary between dissepimentarium and tabularium indistinguishable. Septal crests apparently lacking. In longitudinal section dissepimentarium narrow with interspersed zones of small and large dissepiments. Tabularium wide composed of highly distally convex tabellae.

*Remarks.*—It is quite possible that this is a spongophyllid coral allied to *Tabellaephyllum*. It is difficult to assign the species and it is placed provisionally with *Cystiphyloides*.

*Occurrence.*—Middle Devonian, Traverse group, Potter Farm formation, locality 68.

*Type.*—Holotype No. 35286.

### *Cystiphyloides americanum* (Edwards and Haime)

(Pl. II, Figs. 1, 2, 7)

*Remarks.*—Typical specimens of this common species are present in the middle part of the Traverse group.

*Occurrence.*—Middle Devonian, Traverse group, Alpena limestone, localities 40 and 53; Four Mile Dam limestone, localities 41 and 53; Gravel Point formation, localities 14 and 14e.

*Types.*—Hypotypes Nos. 35230 and 35301.

***Cystiphyloides americanum bellense* subsp. nov.**

(Pl. I, Figs. 1-3, 8; Pl. IV, Figs. 5-10)

*Description.*—Corallum simple, typically subcylindrical or short ceratoid, ranging from 4 to 8 cm long and from 2 to 3 cm in diameter at the calyx margins. Exterior with closely set, typically well-defined growth annulations. Calyxes bell-shaped with inwardly sloping peripheral platforms, steep walls, and narrow axial pits. Septal crests prominent in calyxes of some specimens, obscure in others. In transverse section dissepimentarium wide, composed of globose dissepiments and small, spinose, irregularly distributed septal crests. Tabularium occupying axial one-third of corallum, composed of distally convex tabellae. In longitudinal section peripheral dissepiments and axial tabellae clearly defined. Dissepiments somewhat globose and convex axially and distally. Axial tabellae small and distally convex.

*Remarks.*—The subspecies is similar to typical *C. americanum* from the Hamilton group of New York and southwestern Ontario, but differs in its short, stubby growth form.

*Occurrence.*—Middle Devonian, Traverse group, Bell shale, localities 30, 38, 55; Rockport Quarry limestone, locality 38; Ferron Point formation, locality 79.

*Types.*—Holotype No. 35169; Paratypes Nos. 35168, 35171, 35177, and 35182.

***Cystiphyloides americanum elongatum* subsp. nov.**

(Pl. III, Figs. 3-4; Pl. V, Fig. 1)

*Description.*—Corallum very long, expanding rapidly in neanic stage to maximum diameter and remaining cylindrical to a maximum length of almost 34 cm with an average diameter of 4.5 cm among specimens seen. Exteriors lightly to moderately annulated. Calyxes shallowly bell-shaped. Internal structures similar to those of typical *C. americanum* except that septal crests are much less developed, and the boundary between the tabularium and dissepimentarium is not as clearly defined.

*Occurrence.*—Middle Devonian, Traverse group, Thunder Bay limestone, locality 35.

*Types*.—Holotype No. 35284; paratype No. 35285, unfigured paratype No. 35282.

***Cystiphyllodes petoskeyense* sp. nov.**

(Pl. II, Fig. 10; Pl. III, Fig. 9; Pl. VI, Figs. 1-3)

?*Cystiphyllum aggregatum* Rominger, 1876, p. 139, *non* Billings, 1859.

*Description*.—Corallum closely phaceloid or subcerioid with corallites typically in lateral contact, attached by epithecal expansions. Corallites subcylindrical, averaging a little less than 3 cm in diameter. Exteriors with well-developed annulations. Calyxes shallowly bell-shaped to saucer-shaped. Faint septal crests visible in some calyxes. In transverse section dissepiments and tabellae relatively large, of same size. Boundary between dissepimentarium and tabularium indeterminate. No septal crests visible in longitudinal section, also no distinct boundary between dissepimentarium and tabularium visible. Dissepiments and tabellae of same size and typically distally convex, becoming more nearly axially convex near the periphery.

*Remarks*.—This species is peculiar in the similarity between the dissepiments and tabellae. In this respect it is quite distinct from other phaceloid species of the genus. It has a much more closely aggregate growth form than *C. alpenense*.

*Occurrence*.—Middle Devonian, Traverse group, Petoskey limestone, localities 13 and 21; Potter Farm formation, locality 68.

*Types*.—Holotype No. 44082; paratypes Nos. 44081 and 44313.

***Cystiphyllodes phacelliforme* sp. nov.**

(Pl. I, Figs. 4-5; Pl. V, Fig. 2)

*Description*.—Corallum phaceloid, composed of subcylindrical corallites ranging from 2.5 to 3 cm in diameter. Exteriors extremely rugose with deep, offset annulations. Calyxes shallow, saucer-shaped, 1 cm deep in holotype.

In transverse section dissepimentarium filled with large dissepiments with no trace of septal crests. Tabularium filled with medium-sized tabellae. In longitudinal section dissepiments large, globose, distally and slightly axially convex. Tabellae convex distally. Boundary between dissepimentarium and tabularium indistinct.

*Remarks*.—The species is easily distinguished from *C. aggregatum* by the larger sized, strongly rugose corallites and by the lack of septal crests.

*Occurrence*.—Middle Devonian, Traverse group, Ferron Point formation, locality 79, Genshaw formation, Grabau locality 28.

*Type*.—Holotype No. 35289.

***Cystiphyllodes potterense* sp. nov.**

(Pl. III, Figs. 1-2; Pl. IV, Fig. 4; Pl. V, Fig. 3; Pl. VI, Figs. 4-5)

*Description.*—Corallum short, stubby, ceratoid to trochoid. Exterior moderately to heavily annulated. Calyx shallow to moderately deep, saucer-shaped or bell-shaped. Thick septal ridges prominent in calyx. In transverse section dissepimentarium distinguished from tabularium by smaller size of dissepiments. In longitudinal section dissepiments relatively large, coarse, with thick walls. Tabellae irregularly arranged, some distally convex, others horizontal. Septal cones moderately developed.

*Remarks.*—This species is distinguished from typical *C. americanum* in having much coarser dissepiments and more prominently developed septal ridges in the calyx.

*Occurrence.*—Potter Farm formation, locality 68; Petoskey limestone, locality 21.

*Types.*—Holotype No. 35266; paratype Nos. 35178 and 44315; unfigured paratype No. 35313.

***Cystiphyllodes tabulatum* sp. nov.**

(Pl. II, Figs. 5-6; Pl. V, Fig. 4)

*Description.*—Corallum simple, short ceratoid, heavily annulated, and with a shallow, saucer-shaped calyx. In transverse section dissepiments and tabellae of approximately equal size. Septal crests short, spinose, numerous, present throughout all except axial areas. In longitudinal section dissepiments and tabulae typically large, elongate, distally and axially convex, boundary between dissepimentarium and tabularium indeterminate. Strongly developed septal cones present in periaxial and peripheral regions. In some areas of the periphery clusters of small dissepiments visible.

*Remarks.*—This species is distinguished by the large, elongate dissepiments and tabellae and by the strongly developed septal cones and septal crests.

*Occurrence.*—Middle Devonian, Traverse group, Gravel Point formation, localities 14 and 14e.

*Types.*—Holotype No. 35300; paratype No. 44314.

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*Manuscript Received October 6, 1961*

PLATES

## EXPLANATION OF PLATE I

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PLATE I

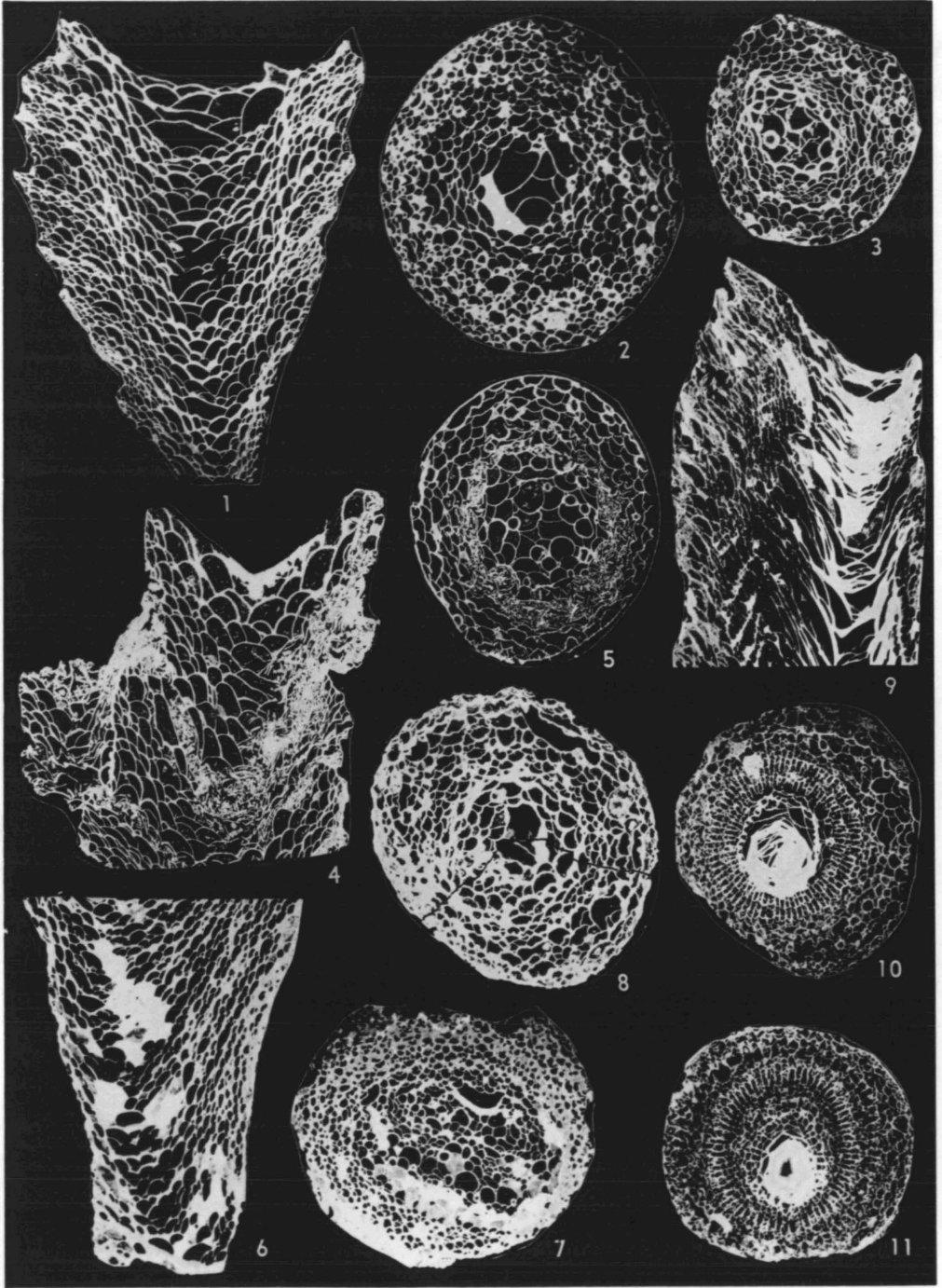
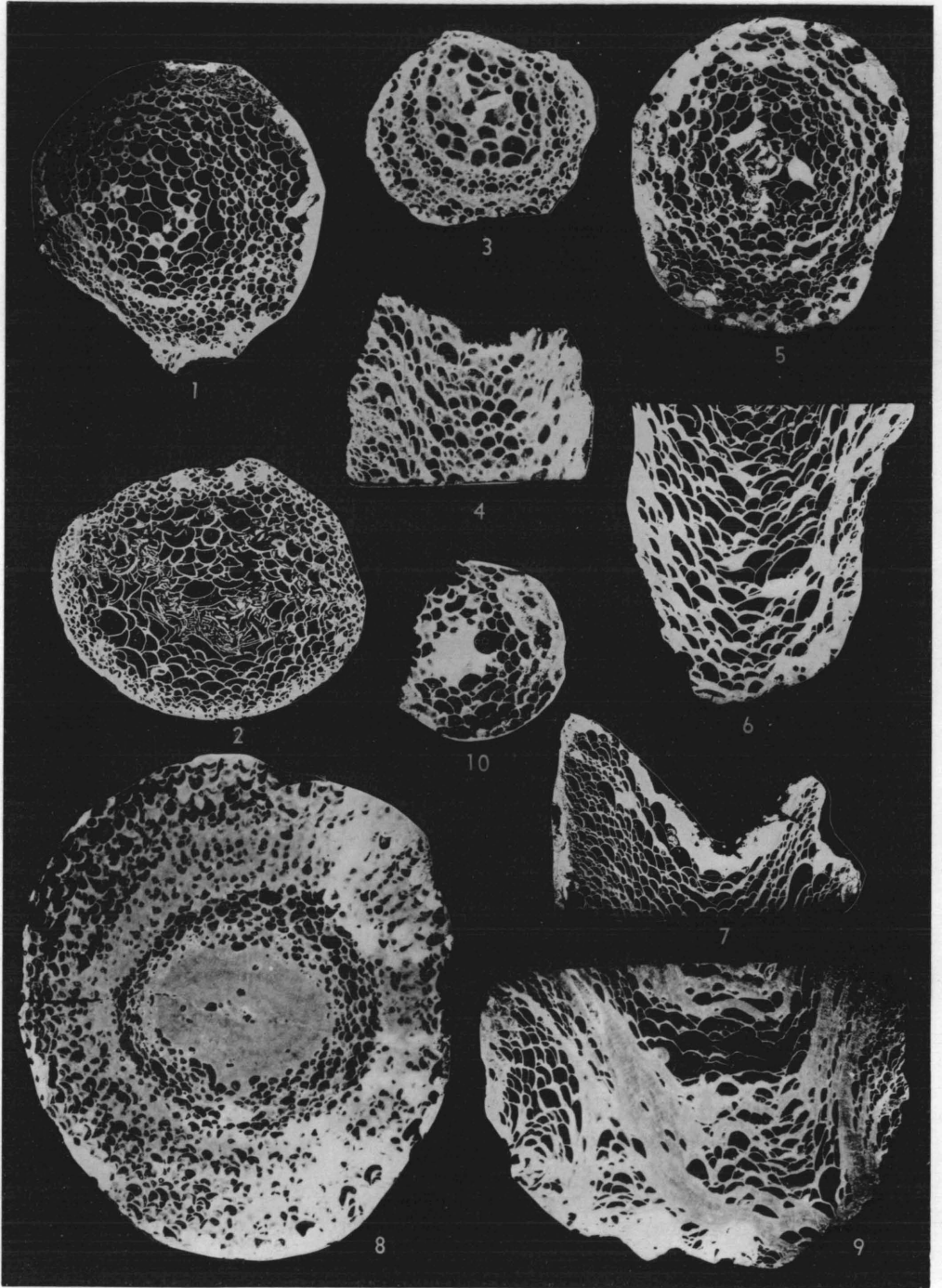


PLATE II





## EXPLANATION OF PLATE II

(All figures x 1½)

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PLATE III

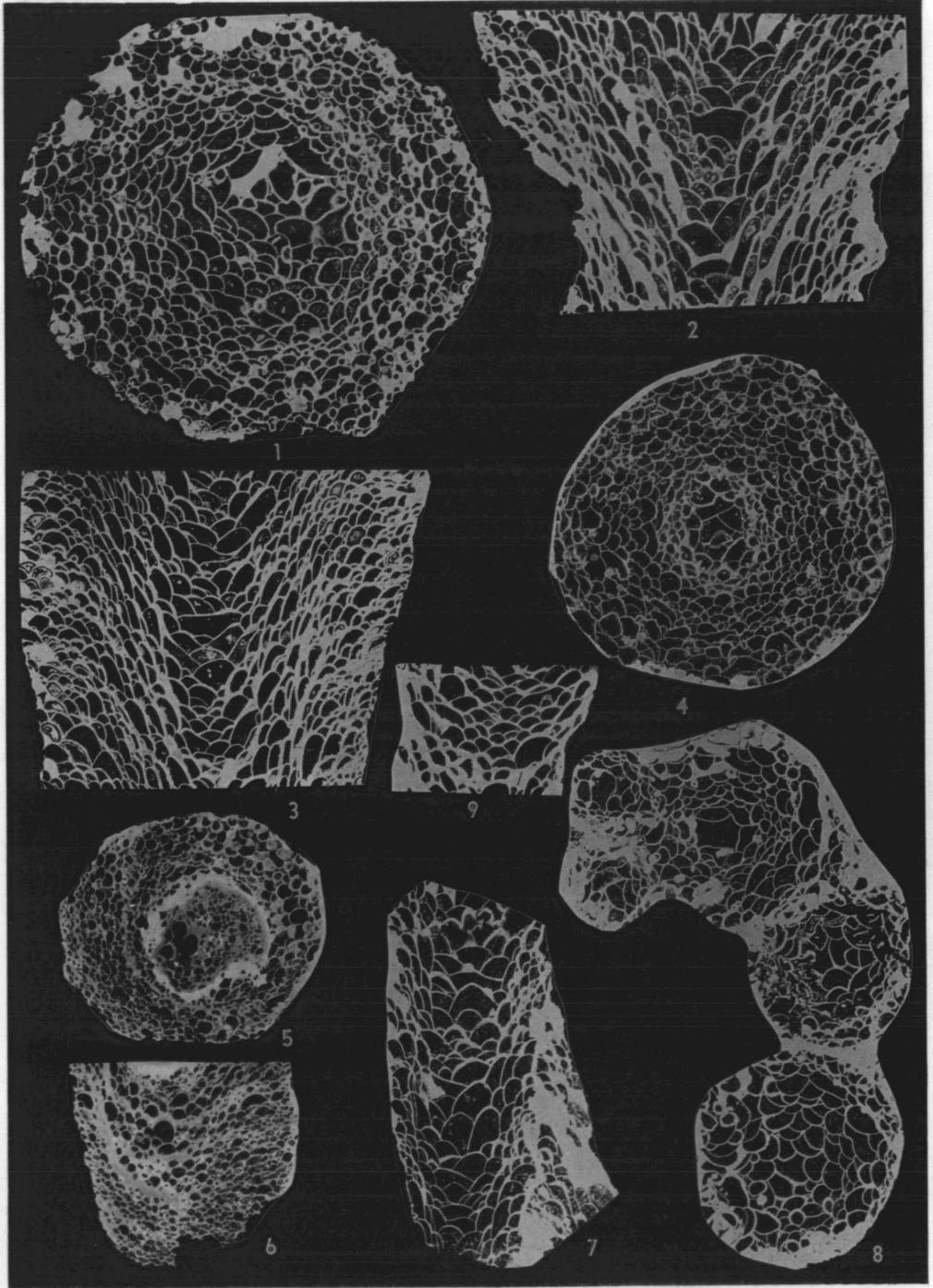


PLATE IV



## EXPLANATION OF PLATE IV

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(All figures  $\times 1$ )

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PLATE V

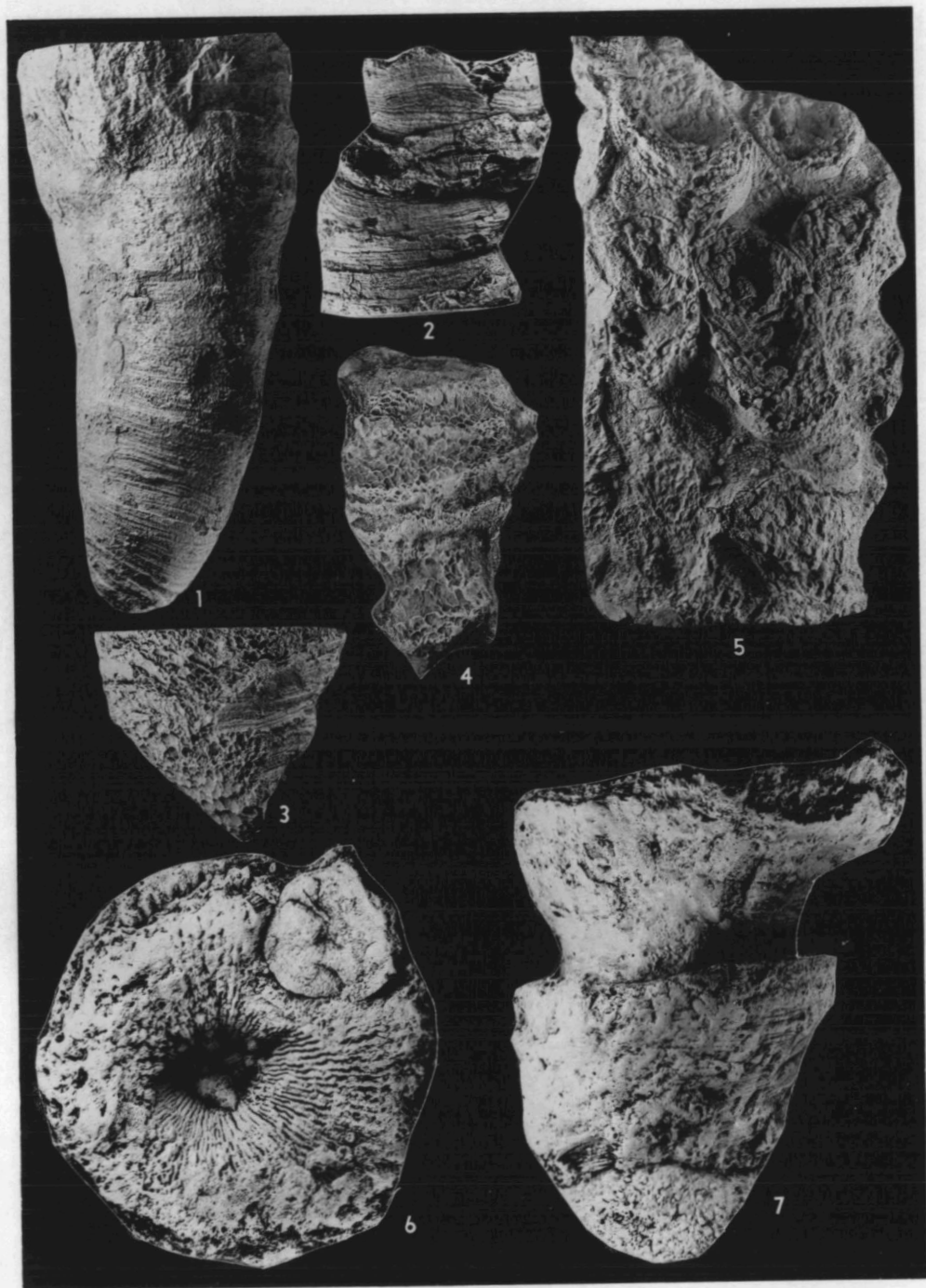
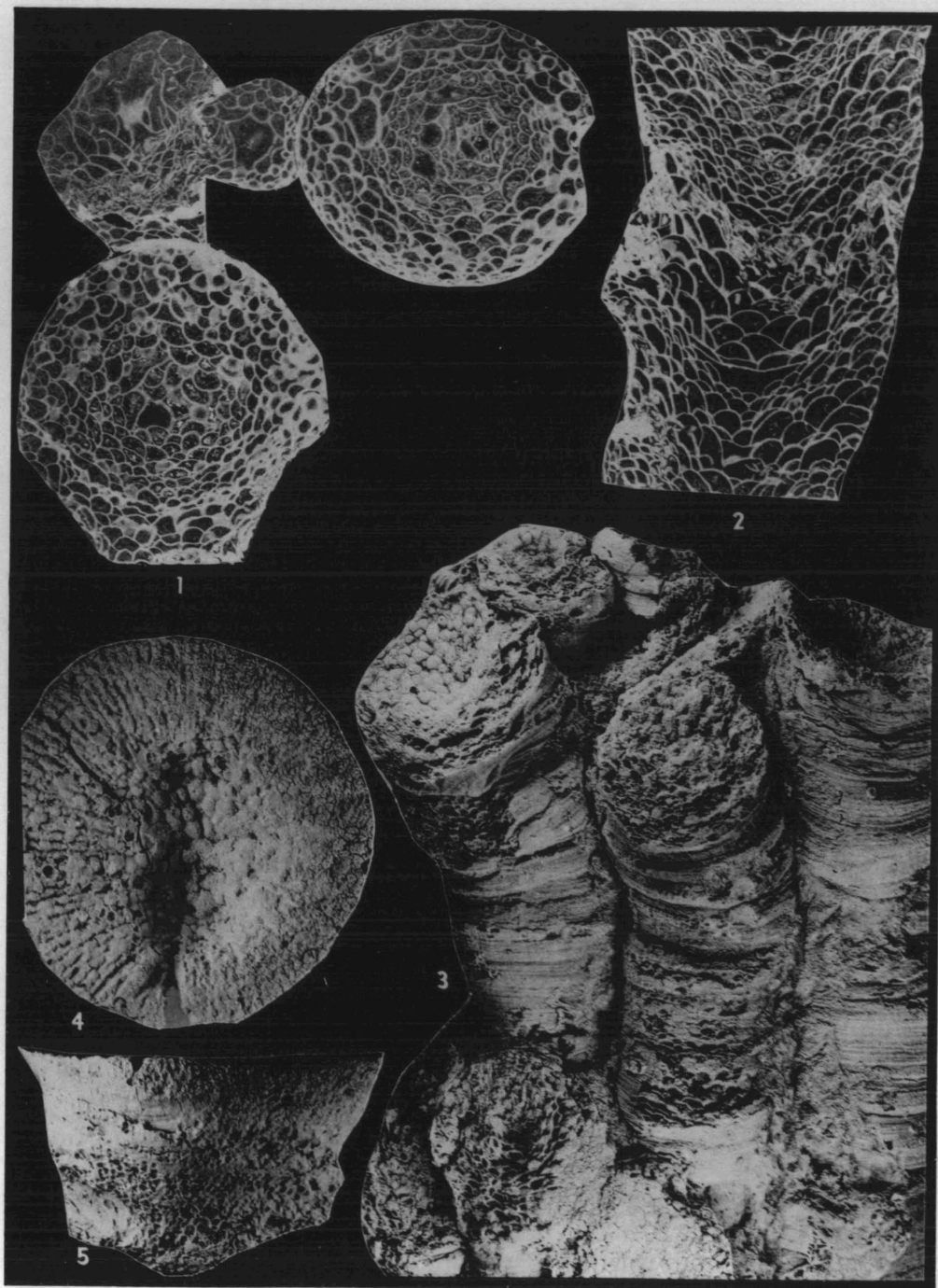


PLATE VI





## EXPLANATION OF PLATE VI

(Exteriors x 1, sections x 1½)

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