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CORALS OF THE TRAVERSE GROUP OF MICHIGAN
PART 13, *HEXAGONARIA*

ERWIN C. STUMM



MUSEUM OF PALEONTOLOGY
THE UNIVERSITY OF MICHIGAN
ANN ARBOR

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VOLUME 23

1. The rodents from the Hagerman local fauna, Upper Pliocene of Idaho, by Richard J. Zakrzewski. Pages 1-36, with 13 text-figures.
2. A new brittle-star from the Middle Devonian Arkona Shale of Ontario, by Robert V. Kesling. Pages 37-51, with 6 plates and 2 text-figures.
3. Phyllocarid crustaceans from the Middle Devonian Silica Shale of northwestern Ohio and southeastern Michigan, by Erwin C. Stumm and Ruth B. Chilman. Pages 53-71, with 7 plates and 4 text-figures.
4. *Drepanaster wrighti*, a new species of brittle-star from the Middle Devonian Arkona Shale of Ontario, by Robert V. Kesling. Pages 73-79, with 2 plates.

CORALS OF THE TRAVERSE GROUP OF MICHIGAN PART 13, *HEXAGONARIA*

ERWIN C. STUMM *

ABSTRACT—Species of the colonial rugose coral genus *Hexagonaria* are among the most common corals to be found in the Traverse Group. *H. anna* (Whitfield) occurs from the Bell Shale into upper part of the Ferron Point Formation. *H. percarinata* (Sloss), the well-known Petoskey Stone, is common in the Gravel Point Formation. *H. cristata* (Rominger) is present in the Gravel Point Formation. The new species *H. fusiformis* is confined to the Genshaw Formation with one problematical specimen from the Newton Creek Limestone and one that may have come from the Ferron Point Formation. The two new species *H. subcarinata* and *H. alpenensis* are common in the Alpena Limestone. The new species *H. attenuata* is present in the Alpena Limestone, the Four Mile Dam Formation, and the Charlevoix Limestone; and the new species *H. potterensis* is present in the Potter Farm Formation and in the Thunder Bay Limestone. The species *H. profunda* (Hall), so common in the Cedar Valley Limestone of Iowa, is known from one specimen in the Petoskey Limestone.

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INTRODUCTION AND ACKNOWLEDGMENTS

SPECIES OF *Hexagonaria* are the most common compound rugose corals to be found in the Traverse Group. Specimens of different species of the genus are found in all formations of the group except the Norway Point Shale and the Upper Devonian Squaw Bay Limestone. They are beautifully preserved in the calcareous shales in several of the formations. The common species *H. percarinata* (Sloss) is exposed in the soft calcareous shales along the south shore of Little Traverse Bay, where specimens are washed onto the beach by storm waves. The specimens show well-preserved internal structures and have for many years been cut and polished by proprietors of lapidary shops in Petoskey to form fountain pen desk sets, book ends, and countless other objects. These have

long been known as "Petoskey Stones." In 1965, the Michigan Legislature designated the Petoskey Stone as the official state stone in Michigan. Eight other species of *Hexagonaria* are known from the Traverse Group, and most of them when cut and polished form stones equally as beautiful as the Petoskey Stone.

I wish to thank Dr. G. M. Ehlers and his assistants for permission to use some of the many thin sections prepared by them over the years. My thanks are also due to Dr. E. S. Richardson of the Field Museum, Chicago, for the loan of Sloss' rugose coral types from the Traverse Group. I am also indebted to Dr. C. A. Arnold and Dr. R. V. Kesling for critically reviewing the manuscript.

All specimens illustrated herein are deposited in the Museum of Paleontology, The University of Michigan.

* Died April 24, 1969.

SYSTEMATIC DESCRIPTION

Phylum COELENTERATA
Class ANTHOZOA
Order RUGOSA
Genus HEXAGONARIA Gürich

Hexagonaria Gürich, 1896, p. 172.

Type species.—By subsequent designation of Lang, Smith, & Thomas, 1940, p. 69, *Cyathophyllum hexagonum* Goldfuss, 1826, partim, p. 61, pl. 20, figs. 1a-b only, Middle Devonian, Eifel District, Germany.

For description of type species, see Stumm (1948, p. 14, 15, pl. 4, fig. 1; pl. 6, figs. 1, 2).

HEXAGONARIA ANNA (Whitfield)

Pl. 1, figs. 1, 6, 10; pl. 2, figs. 1, 2, 6, 7, 9, 10

Stylasteria anna Whitfield, 1882, p. 199; 1893, p. 420, pl. 2, figs. 1-5.

Prismatophyllum annum Stewart, 1938, p. 49, pl. 9, figs. 11, 12.

Hexagonaria anna Stumm, 1948, p. 25, 26, pl. 5, fig. 3; pl. 13, figs. 1, 2; pl. 14, figs. 3-6; 1967, p. 105-108, pl. 1, figs. 1-21.

For description see Stumm (1948, p. 25, 26).

Remarks.—The specimens from the lower part of the Traverse group are conspecific with Whitfield's species, which is from either the upper part of the Dundee Limestone or the lower part of the "blue" limestone bed of the Silica Formation, near Antwerp, Paulding County, Ohio. The Traverse specimens of mature size have corallites ranging from 12 to 16 mm in diameter with septa ranging from 32 to 44 in number. A paper on the growth stages of this species was recently published by the author (1967, p. 105-108, pl. 1, figs. 1-21).

Occurrence.—Middle Devonian, Dundee Limestone and Silica Formation, northwestern Ohio; Traverse Group, Bell Shale, Rockport Quarry Limestone, and Ferron Point Formation, northern Michigan.

Types.—Lectotype in Museum of Geology, Ohio State University. Three thin sections of lectotype UMMP 15347; hypotypes UMMP 18810, 18821, 18874, 23900, 23902, 37817, and 56950.

HEXAGONARIA CRISTATA (Rominger)

Pl. 1, fig. 11; pl. 4, figs. 4, 5

Cyathophyllum cristatum Rominger, 1876, p. 108.

Prismatophyllum cristatum Sloss, 1939, p. 71, pl. 10, figs. 1-5.

Prismatophyllum cristatum microcarinatum Sloss, 1939, p. 72, pl. 10, fig. 14.

? *Prismatophyllum pauciseptatum* Sloss, 1939, p. 70, 71, pl. 10, figs. 10-13.

Description.—Corallum cerioid, composed of tetragonal, pentagonal or hexagonal corallites ranging from 16 to over 20 mm in diameter. Calyxes ranging from 5 to 20 mm deep with steeply sloping walls and a narrow base. Peripheral platforms poorly defined or lacking.

Tabulae typically incomplete, a few complete. All tabulae irregularly arranged, horizontal, concave, or convex. Dissepiments in 2 or 3 peripheral rows, axially and distally convex, globose or elongate. Septa ranging from 36 to 44, major extending almost to axis; minor one-fourth to one-third as long. All septa thickened near periphery but not in lateral contact, relatively thin periaxially and axially, major very thin in tabularium. Carinae irregularly distributed. Some corallites with short, thick carinae on some septa, carinae absent on others. Some corallites entirely without carinae.

EXPLANATION OF PLATE 1

All figures $\times 1$

- FIGS. 1, 6, 10—*Hexagonaria anna* (Whitfield). 1, distal view of a relatively large corallum; hypotype UMMP 37817; Ferron Point Formation, Rockport Quarry, Rockport, Michigan. 6, distal surface of an unusually well-preserved specimen; hypotype UMMP 56950; Ferron Point Formation, Rockport Quarry, Rockport, Michigan. 10, part of a specimen; hypotype UMMP 18810; Rockport Quarry Limestone at the type locality.
- 2, 4, 5—*Hexagonaria fusiformis* n. sp. 2, an average specimen showing wide platforms; paratype UMMP 48214; Genshaw Formation, Rabiteau Farm, south of Long Lake, Alpena County, Michigan. 4, another specimen with shallow calyxes; paratype UMMP 23906; Genshaw or Ferron Point Formation, 0.4 mile E of Swan River on U.S. 23, Presque Isle County, Michigan. 5, distal view of a large corallum with larger than average corallites and showing well-developed axial pits; paratype UMMP 37941; Genshaw Formation, Rabiteau Farm, south of Long Lake, Alpena County, Michigan.
- 3—*Hexagonaria alpenensis* n. sp. View of part of distal surface; holotype UMMP 5317; Alpena Limestone, Sunken Lake, Alpena County, Michigan.
- 7, 9—*Hexagonaria percarinata* (Sloss). 7, a complete, perfectly preserved small corallum; hypotype UMMP 48237; Gravel Point Formation, lower blue shale; Petoskey Portland Cement Company Quarry, Petoskey, Emmet County, Michigan. 9, view of Alexander Winchell's original specimen, which he referred to *Acerularia davidsoni* (1866, p. 42, 43, 85); hypotype UMMP 21890; Gravel Point Formation, south shore of Little Traverse Bay, Emmet County, Michigan.
- 8—*Hexagonaria profunda* (Hall). Distal view of part of corallum showing erect calyx walls; hypotype UMMP 25149; Kegomic Quarry, East Bay View, Emmet County, Michigan.
- 11—*Hexagonaria cristata* (Rominger). Distal view of part of holotype UMMP 5322; Gravel Point Formation, shore of Little Traverse Bay, near Petoskey, Michigan.

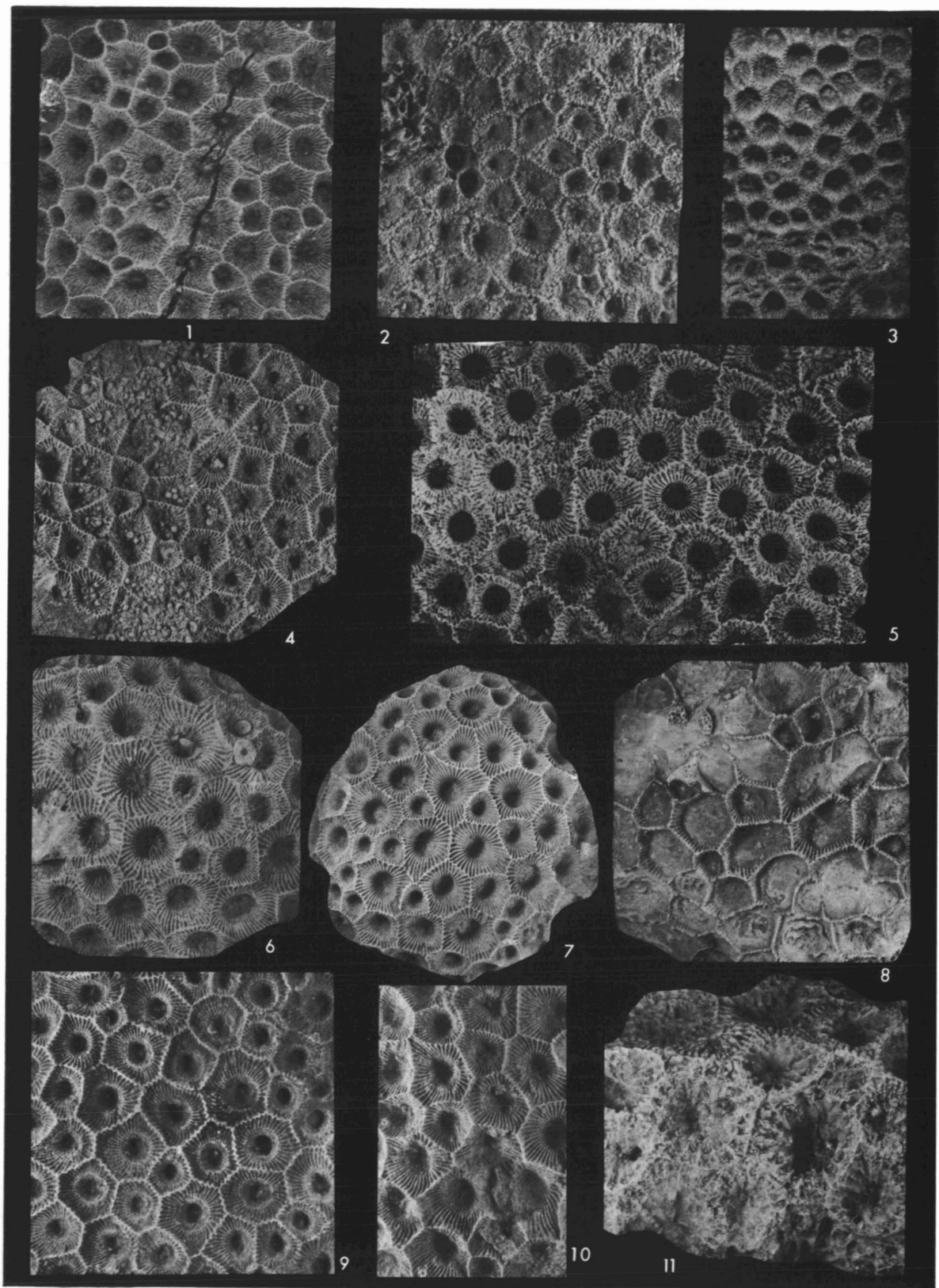


PLATE 1

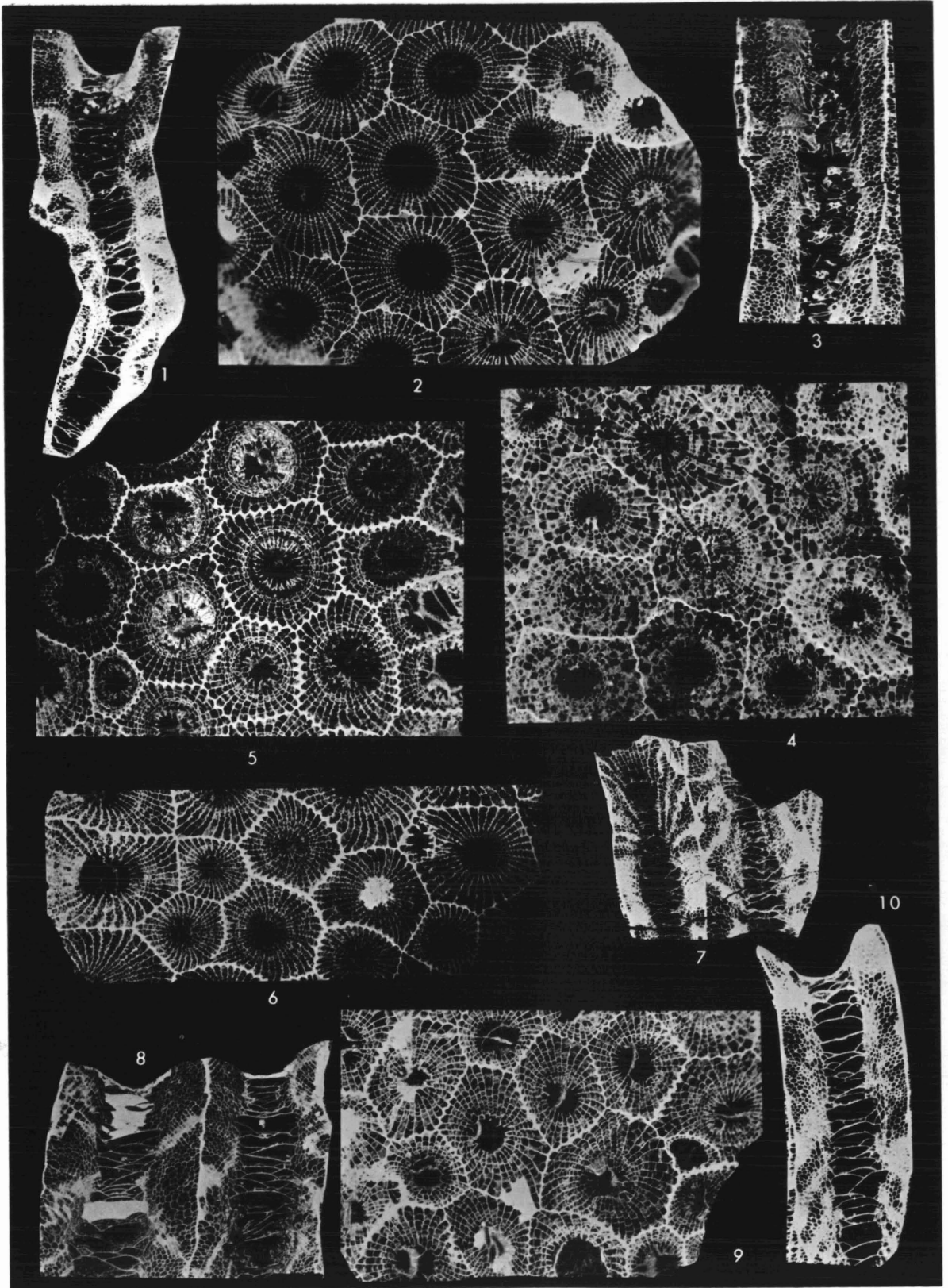


PLATE 2

Remarks.—Sloss' subspecies *H. cristata microcarinata* appears to intergrade with the typical species. A single specimen described as *Prismatophyllum pauciseptatum* by Sloss (1939) was found by him in the float in the Petoskey Limestone at the Kegomic Quarry. This is the only specimen known. The internal features are almost identical with those of *H. cristata*. I believe this float specimen came originally from the Gravel Point Formation.

Occurrence.—Middle Devonian, Gravel Point Formation, mainly from the 10 to 15 foot limestone interval between the lower and upper blue shales (zone 6, bed 2 of Pohl, 1930, p. 10, 11) Little Traverse Bay region.

Types.—Holotype UMMP 5322; hypotypes UMMP 15557 and 25633.

HEXAGONARIA FUSIFORMIS n. sp.

Pl. 1, figs. 2, 4, 5; pl. 2, figs. 3-5, 8

Description.—Corallum low hemispherical or patelloid, composed of prismatic corallites which may be tetragonal, pentagonal, or hexagonal in outline, ranging from 6 to 10 mm in diameter. Calyxes with broad peripheral platforms and deep axial pits with almost vertical walls. Pits with maximum depth of 8 mm. Septa ranging from 34 to 38. In transverse section major septa extending from two-thirds to three-fourths distance to axis, becoming distinctly or slightly rhopaloid at their axial ends. Minor septa extending about one-half distance to axis, with attenuate axial ends. Carinae weakly developed. Walls between corallites distinctly zigzag. In longitudinal section tabularia occupying axial one-third to one-half of corallites, composed of closely set, complete or incomplete, relatively horizontal tabulae. Dissepiments confined to axial one-third to one-half of coralla, small, globose, distally and axially convex.

Remarks.—The species is similar to *H. anna* except for the longer, rhopaloid major

septa on the mature corallites and the more distinctly zigzag corallite walls.

Occurrence.—Middle Devonian, Traverse Group, Genshaw Formation, ?Ferron Point Formation, and ?Newton Creek Limestone, Alpena, Presque Isle, and Cheboygan Counties, Michigan. The Newton Creek Limestone specimen is so poorly preserved that it is provisionally assigned to this species.

Types.—Holotype UMMP 18818; paratypes UMMP 23906, 23907, 37941, and 48214. Provisionally assigned UMMP 25157.

HEXAGONARIA PERCARINATA (Sloss)

Pl. 1, figs. 7, 9; pl. 4, figs. 1-3, 8

Acerularia davidsoni Winchell, 1866, p. 42, 43, 85, non *Acerularia davidsoni* Edwards & Haime, 1851, p. 418, 419, pl. 9, figs. 4, 4a-b.

Cyathophyllum davidsoni Rominger, 1876, p. 107, 108, pl. 37, fig. 4, non *Cyathophyllum davidsoni* Edwards & Haime, 1851, p. 389.

Prismatophyllum percarinatum Sloss, 1939, p. 69, 70, pl. 10, figs. 6-9.

For description see Sloss (1939, p. 69, 70).

Remarks.—This is the famous Petoskey Stone adopted by the legislature as "the state stone of Michigan." The species is apparently confined to the Little Traverse Bay Region. It can be distinguished from similar species from the Newton Creek Limestone, Alpena Limestone, Potter Farm Formation, and Charlevoix Limestone by the false inner wall created by crowding of dissepiments and carinae at the axial ends of the minor septa and in being much more heavily carinate than the other species.

Occurrence.—Middle Devonian, Traverse Group, Gravel Point Formation, Little Traverse Bay region, Michigan.

Types.—Holotype Field Museum 38746; hypotypes UMMP 18830, 18848, 18851, 21890, 25148 and 48237.

EXPLANATION OF PLATE 2

All figures × 2

FIGS. 1, 2, 6, 7, 9, 10—*Hexagonaria anna* (Whitfield). 1, 2, longitudinal and transverse sections; hypotype UMMP 18874; Bell Shale, Calcite Quarry, Rogers City, Michigan. 6, 7, transverse and longitudinal sections; hypotype UMMP 23900; Rockport Quarry Limestone, Rockport Quarry, Rockport, Alpena County, Michigan. 9, transverse section; hypotype UMMP 18821; Ferron Point Shale, Black Lake Quarry, 5 miles N of Onaway, Presque Isle County, Michigan. 10, longitudinal section; hypotype UMMP 23902; Ferron Point Formation, abandoned shale pit of Alpena Portland Cement Company, Alpena County, Michigan.

3-5, 8—*Hexagonaria fusiformis* n. sp. 3, 4, specimen provisionally assigned to this species; figured specimen UMMP 25157; Newton Creek Limestone, quarry of the Huron Portland Cement Company, Alpena, Michigan. 5, transverse section showing swollen axial ends of major septa; holotype UMMP 18818; Genshaw Formation, dam on Black River ½ mile NE of Tower, Cheboygan County, Michigan. 8, longitudinal section showing wide, incomplete tabulae; paratype UMMP 23907; Genshaw Formation, roadcut on US 23, 0.4 mile east of Swan Creek, Presque Isle County, Michigan.

HEXAGONARIA ALPENENSIS n. sp.

Pl. 1, fig. 3; pl. 3, figs. 5, 6

Description.—Corallum originally hemispherical, composed of small, tetragonal, pentagonal or rarely hexagonal corallites, ranging in diameter from 2 to 6 mm. Calyx walls almost erect, some expanding slightly in distal portion. Bases of calyces typically rounded. As seen in calyces, major septa approaching axis, minor very short.

In transverse section, corallite walls relatively thick and straight. Septa ranging from 26 to 28, narrowly cuneate. Major typically extending from one-half to two-thirds distance to axis, a few reaching axis. Minor septa averaging about one-half as long. Carinae very small and obscure. In transverse section, tabularium wide, composed of typically complete, rarely incomplete, horizontal tabulae spaced from 0.5 to 1.0 mm apart. Dissepimentarium very narrow, composed of 2 to 3 rows of very small, highly globose, axially and distally directed dissepiments.

Remarks.—This is the smallest species of *Hexagonaria* in the Traverse Group. Its external and internal structures make it very easy to distinguish.

Occurrence.—Middle Devonian, Traverse Group, upper part of Alpena Limestone, Alpena and Presque Isle Counties, Michigan.

Type.—Holotype UMMP 5317.

HEXAGONARIA SUBCARINATA n. sp.

Pl. 3, figs. 3, 4, 7, 8

Description.—Corallum hemispherical, al-

most identical to *H. percarinata* Sloss in external appearance but with very weakly developed carinae. Corallites averaging a little over 1 cm in diameter, with septa ranging from 30 to 34, thickened in the peripheral area, attenuate otherwise. Corallite walls thick, zigzag. Major septa variable in length; in some corallites extending to axis, in others extending only a little more than one-half distance to axis. In some specimens minor septa thicken and terminate at margin of tabularium. Boundary between dissepimentarium and tabularium distinct. Carinae scarce and obscure in some corallites, absent in others. Tabulae complete or rarely incomplete, variably spaced, convex, horizontal or concave. Dissepiments small, globose, in 4 to 6 vertical rows.

Remarks.—This is the species which is one of the major framework builders in the famous Alpena coral reefs, so well exposed in the quarry of the Huron Portland Cement Company at Alpena. The close resemblance to *H. percarinata*, except for the lack of abundant carinae, is remarkable. The species are approximately in the same stratigraphic position. The major ecological difference is that *H. percarinata* is far more tolerant to clastic deposits than *H. subcarinata*. I have noticed that species *Hexagonaria* such as *H. anna*, *H. percarinata*, and *H. potterensis*, which are more tolerant to shaly deposits, tend to be more heavily carinate.

Occurrence.—Middle Devonian, Traverse Group, Alpena Limestone, Alpena County, Michigan.

Types.—Holotype UMMP 18833; paratypes UMMP 18837 and 18842.

EXPLANATION OF PLATE 3

All sections $\times 2$

- FIGS. 1, 2—*Hexagonaria potterensis* n. sp. 1, transverse section showing long, heavily carinate septa; holotype UMMP 25638; Potter Farm Formation, shale pit just west of Evergreen Cemetery, Alpena, Michigan. 2, longitudinal section showing irregular tabulae and wide dissepimentarium; paratype UMMP 18849; same occurrence as holotype.
- 3, 4, 7, 8—*Hexagonaria subcarinata* n. sp. 3, transverse section showing distinct margin of tabularium; paratype UMMP 18837; Alpena Limestone, quarry of the Huron Portland Cement Company, Alpena, Michigan. 4, longitudinal section of same specimen showing horizontal and distally convex complete and incomplete tabulae. 7, very characteristic transverse section showing distinct tabularium margin; this is very similar to *H. percarinata* except for the lack of abundant carinae; holotype UMMP 18833; Alpena Limestone, quarry of the Huron Portland Cement Company, Alpena, Michigan. 8, longitudinal section showing variously spaced tabulae; paratype UMMP 18842; Alpena Limestone, upper biohermal beds, abandoned quarry of the Thunder Bay Quarries Company, Alpena, Michigan.
- 5, 6—*Hexagonaria alpenensis* n. sp. 5, 6, transverse and longitudinal sections; holotype UMMP 5317; upper part of Alpena Limestone, Alpena County, Michigan.
- 9–11—*Hexagonaria attenuata*, n. sp. 9, 10, transverse and longitudinal sections of a specimen showing the long, thin septa and the irregular tabulae mixed with the axial ends of the major; holotype UMMP 47141; Four Mile Dam Formation, bioherm at Four Mile Dam, Thunder Bay River, Alpena County, Michigan. 11, transverse section showing indistinct boundary between tabularium and dissepimentarium, and the long, very thin septa; paratype UMMP 25150; Alpena Limestone, abandoned Thunder Bay Quarry, Alpena Michigan.

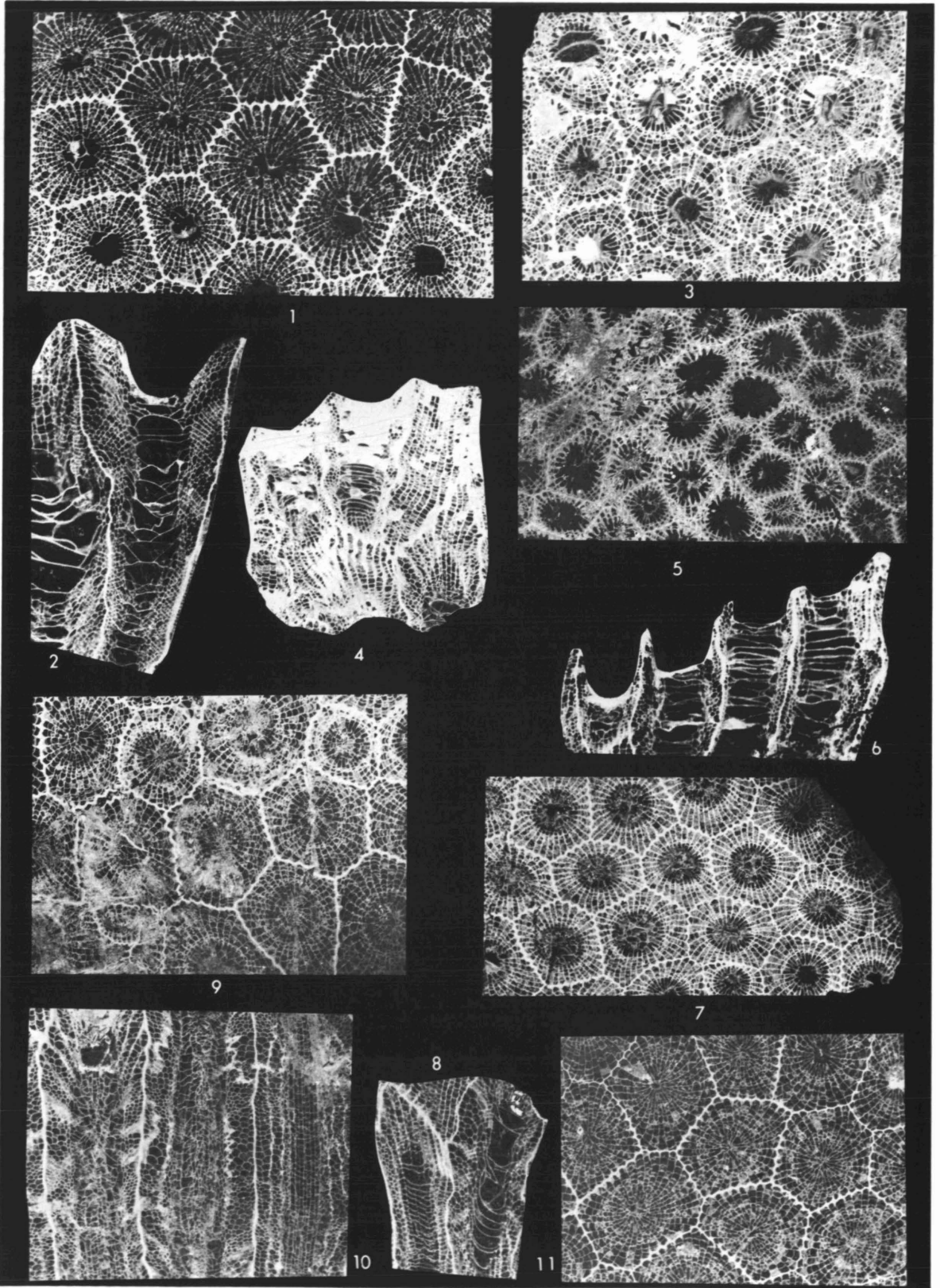


PLATE 3

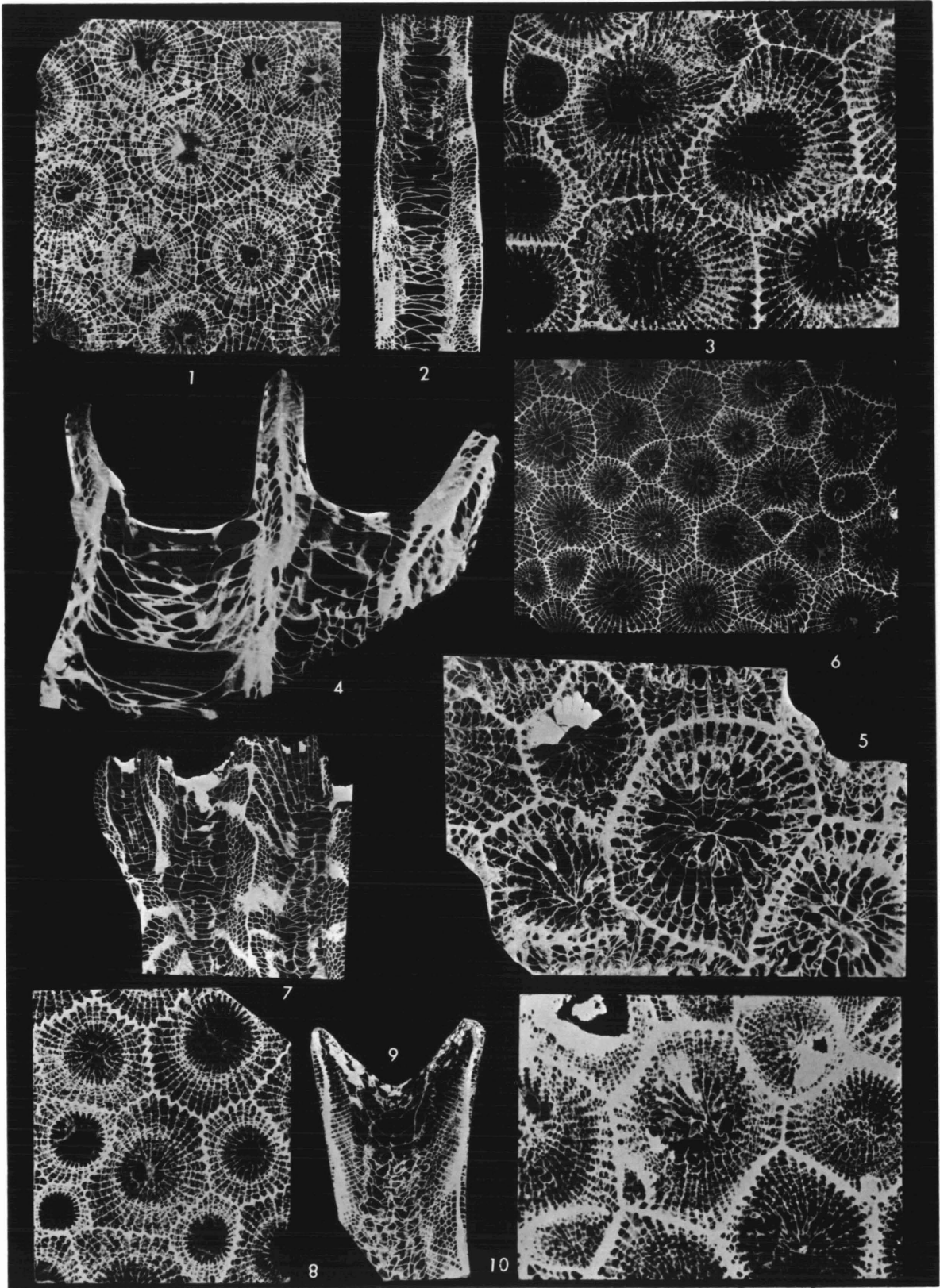


PLATE 4

HEXAGONARIA ATTENUATA n. sp.

Pl. 3, figs. 9-11; pl. 4, figs. 6, 7

Description.—Corallum cerioid, hemispherical, with pentagonal or hexagonal corallites averaging 1 cm in diameter. External appearance very similar to *H. subcarinata*. In transverse section septa ranging from 30 to 38, very thin; major extending to axis, minor almost as long. No sharp boundary between tabularium and dissepimentarium. Carinae weakly developed, absent in some corallites. In longitudinal section tabulae thin, incomplete, mixed with axial ends of major septa. Dissepiments small to medium size, globose, distally convex.

Remarks.—The major difference between *H. attenuata* and *H. subcarinata* is the longer major septa in the former species and the lack of a distinct boundary between dissepimentarium and tabularium in transverse section. The corallites in the specimen from the Charlevoix Limestone average somewhat smaller than those from the Thunder Bay region.

Occurrence.—Middle Devonian, Traverse Group, Alpena Limestone and Four Mile Dam Formation, Alpena County; Charlevoix Limestone, Charlevoix and Emmet Counties, Michigan.

Types.—Holotype UMMP 47141; paratypes UMMP 25150 and 43722.

HEXAGONARIA POTTERENSIS n. sp.

Pl. 3, figs. 1, 2

Description.—Corallum low hemispherical, composed of tetragonal, pentagonal, or hexagonal corallites, quite variable in size, ranging from 0.4 to 1.5 cm in diameter. Calyx walls

steep though not vertical as in *H. profunda*. Base of calyxes relatively broad and flat (pl. 3, fig. 2). No distinct peripheral platforms present. As seen in transverse section, septa in mature corallites ranging from 36 to 38. Major septa extending two-thirds to three-fourths distance to axis; minor septa almost as long as major. All septa heavily carinate. Corallite walls thick, with a zigzag appearance caused by swelling of septa at peripheral ends. In longitudinal section, tabularium wide, composed of very irregularly distributed complete and incomplete tabulae. Dissepimentarium expanding rapidly distally, composed of many rows of small, axially and distally directed dissepiments through which the upward and inward arching carinae are distinctly visible.

Remarks.—The calyx walls in this species are intermediate between those of *H. percarinata* and *H. profunda*. The external surface has not been illustrated, as it is too poorly preserved.

Occurrence.—Middle Devonian, Traverse Group, Potter Farm Formation, shale pit at west side of Evergreen Cemetery, Alpena, Michigan; Thunder Bay Limestone, Partridge Point, 4 miles south of Alpena, Michigan.

Types.—Holotype UMMP 25638; paratype UMMP 18849.

HEXAGONARIA PROFUNDA (Hall)

Pl. 1, fig. 8; pl. 4, figs. 9, 10

Acervularia profunda Hall, 1858, p. 476, 477, pl. 1, figs. 7a-c; Calvin, 1892a, p. 355-358; 1892b, p. 30-32.
Prismatophyllum profundum Stainbrook, 1940, p. 281, 282, pl. 36, figs. 1, 2; pl. 39, figs. 3, 4.

EXPLANATION OF PLATE 4

All figures $\times 2$

- FIGS. 1-3, 8—*Hexagonaria percarinata* (Sloss). 1, transverse section showing variable lengths of major septa; hypotype UMMP 18848; Gravel Point Formation, lower blue shale, Penn-Dixie (formerly Petoskey) Portland Cement Company Quarry, near Petoskey, Emmet County, Michigan. 2, longitudinal section showing complete and incomplete tabulae; hypotype UMMP 18830; Gravel Point Formation, lower blue shale, quarry of the Penn-Dixie Cement Company, Petoskey, Michigan. 3, characteristic transverse section of a specimen showing differentiated tabularium and dissepimentarium; hypotype UMMP 25148; Gravel Point Formation, shore of Little Traverse Bay, about 1½ miles W of Charlevoix, Charlevoix County, Michigan. 8, characteristic transverse section showing crowding of dissepiments at margin of tabularium and profuse yardarm carinae; hypotype UMMP 18851; Gravel Point Formation, lower blue shale, same occurrence as original of figure 2.
- 4, 5—*Hexagonaria cristata* (Rominger). 4, longitudinal section showing wide tabularium; hypotype UMMP 15557; Gravel Point Formation, upper blue shale, south shore of Lake Michigan at Bay View, near Petoskey, Michigan. 5, transverse section showing septal arrangement; hypotype UMMP 25633; cliff on shore of Little Traverse Bay.
- 6, 7—*Hexagonaria attenuata* n. sp. Transverse and longitudinal sections; paratype UMMP 43722; Charlevoix Limestone; E end of Penn-Dixie Portland Cement Company, near Petoskey, Emmet County, Michigan.
- 9, 10—*Hexagonaria profunda* (Hall). Longitudinal and transverse sections of hypotype UMMP 25149; Petoskey Limestone, Kegonic Quarry, East Bay View, Emmet County, Michigan.

TABLE 1—CHARACTERISTICS OF SPECIES OF HEXAGONARIA

Characteristic	<i>H</i> <i>anna</i>	<i>H.</i> <i>cristata</i>	<i>H</i> <i>fusiformis</i>	<i>H</i> <i>percarinata</i>	<i>H</i> <i>alpenensis</i>	<i>H</i> <i>subcarinata</i>	<i>H</i> <i>attenuata</i>	<i>H</i> <i>potierensis</i>	<i>H</i> <i>profunda</i>
Corallite max. diam.	12-16 mm	16-20 mm	6-10 mm	10 mm average	2-6 mm	8-12 mm	8-14 mm	4-15 mm	13-15 mm
Number of septa	32-44	36-44	34-38	38-40	26-28 cuneate	30-34	30-38 very thin	36-38	38-42
Relative length of major septa	$\frac{1}{2}$ distance to axis	Almost to axis	$\frac{2}{3}$ to $\frac{3}{4}$ distance to axis, rhopaloid	Approach axis	$\frac{1}{2}$ to $\frac{2}{3}$ distance to axis	To or near axis, thin in tabularium	Very thin, extending to axis	$\frac{2}{3}$ to $\frac{3}{4}$ distance to axis	To or almost to axis
Relative length of minor septa	$\frac{1}{2}$ distance to axis	$\frac{1}{4}$ to $\frac{7}{8}$ distance to axis	$\frac{1}{2}$ distance to axis, attenuate	$\frac{1}{2}$ length of major	$\frac{1}{2}$ length of major	$\frac{1}{2}$ length of major, relatively thick	Almost as long as major	Almost as long as major	About $\frac{1}{2}$ that of major
Dissepiments	Small, numerous, globose	Elongate, narrow	Small, globose	Numerous, small, globose	2-3 rows, very small	Small, globose, 4-6 vertical rows	Small to medium size, distally arched	Many rows, small or medium	Small, in numerous rows
Tabulae	Complete or incomplete	Wide, typically incomplete	Relatively horizontal, complete or incomplete	Horizontal complete or incomplete	Typically complete, 0.5 to 1 mm apart	Complete, rarely incomplete, irregularly arranged	Incomplete, mixed with ends of major septa	Complete or incomplete, variable	Typically incomplete
Calyxes	With prominent peripheral platforms	Peripheral platforms poor or lacking	Broad, relatively flat peripheral platforms	Platforms variable, poorly or well developed	Calyx walls almost erect	Well-developed peripheral platforms	Peripheral platforms present	Steeply inclined calyx walls	Erect calyx walls
Carinae	Yardarm, profuse	Irregular, sparse, or lacking	Weakly developed	Yardarm, profuse	Small, obscure	Scarce or absent	Weakly developed, absent in some corallites	Profuse, typically yardarm	Well-developed yardarm or offset

For description see Stainbrook (1940, p. 281, 282).

Remarks.—One specimen from the Petoskey Limestone is referred to this species which is characteristic of the Cedar Valley Limestone of Iowa. The vertical calyx walls are clearly shown (pl. 1, fig. 8). A hard limestone matrix has made it impossible to excavate to the bases of the calyces. The internal structure (pl. 4, figs. 9, 10) are almost identical with those illustrated by Stainbrook (1940, pl. 39, figs. 3, 4).

Occurrence.—Middle Devonian, Traverse Group, Petoskey Limestone, above *Gypidula petoskeyensis* zone, Kegomic Quarry, Emmet County, Michigan.

Type.—Hypotype UMMP 25149.

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