CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY

THE UNIVERSITY OF MICHIGAN

VOL. XVI, No. 4, pp. 275–285 (2 pls.) SEPTEMBER 18, 1961

CORALS OF THE TRAVERSE GROUP OF MICHIGAN, PART VI, *CLADOPORA, STRIATOPORA,* AND *THAMNOPORA*

BY

ERWIN C. STUMM

MUSEUM OF PALEONTOLOGY
THE UNIVERSITY OF MICHIGAN
ANN ARBOR

CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY

Director: LEWIS B. KELLUM

The series of contributions from the Museum of Paleontology is a medium for the publication of papers based chiefly upon the collection in the Museum. When the number of pages issued is sufficient to make a volume, a title page and a table of contents will be sent to libraries on the mailing list, and to individuals upon request. A list of the separate papers may also be obtained. Correspondence should be directed to the Museum of Paleontology, The University of Michigan, Ann Arbor, Michigan.

VOLS. II–XV. Parts of volumes may be obtained if available.

VOLUME XVI

1. Two Late Pleistocene Faunas from Southwestern Kansas, by Claude W. Hibbard and Dwight W. Taylor. Pages 1–223, with 16 plates.
2. North American Genera of the Devonian Rugose Coral Family Digonophyllidae, by Erwin C. Stumm. Pages 225–243, with 6 plates.
3. Notes on *Jaekelocystis hartleyi* and *Pseudocrinites gordoni,* two Rhombiferan Cystoids Described by Charles Schuchert in 1903, by Robert V. Kesling. Pages 245–273, with 8 plates.
4. Corals of the Traverse Group of Michigan, Part VI, *Cladopora, Striatopora,* and *Thamnopora,* by Erwin C. Stumm. Pages 275–285, with 2 plates.

VOLUME XVII

1. Evaluation of Przibram's Law for Ostracods by Use of the Zeuthen Cartesian-diver Weighing Technique, by Robert V. Kesling and Robert S. Takagi. Pages 1–58, with 5 plates.
2. A New *Glyptocystites* from Middle Ordovician Strata of Michigan, by Robert V. Kesling. Pages 59–76, with 3 plates.

VOL. XVI, No. 4, pp. 275–285 (2 pls.) SEPTEMBER 18, 1961

CORALS OF THE TRAVERSE GROUP OF MICHIGAN, PART VI, *CLADOPORA, STRIATOPORA,* AND *THAMNOPORA*[1]

BY
ERWIN C. STUMM

CONTENTS

INTRODUCTION

PART VI of the study of the corals of the Traverse group of Michigan concerns the tabulate coral genera *Cladopora, Striatopora,* and *Thamnopora.* The first two genera are known from both Silurian and Devonian strata in North America; the third is exclusively Devonian. In this study two new species of *Cladopora* are proposed; the species *Striatopora linneana* Billings is redescribed; *Thamnopora alpenensis* (Rominger) is redescribed; and five new species of *Thamnopora* are proposed.

[1] 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; and Part V in Vol. XIV, No. 11, of the *Contributions from the Museum of Paleontology, University of Michigan.*

PREVIOUS WORK

The only study of corals belonging to these genera from the Traverse group was made by Rominger (1876), who recognized the presence of *Striatopora linneana* Billings and described *"Cladopora" alpenensis* from the "Upper Alpena limestone" (now the Four Mile Dam limestone) in the Alpena region.

ACKNOWLEDGMENTS

The author wishes to thank Dr. L. B. Kellum, Dr. C. A. Arnold, and Dr. R. V. Kesling for reviewing the manuscript of this paper. All type specimens are deposited in the type collection of the Museum of Paleontology, The University of Michigan.

REGISTER OF LOCALITIES

Locality:

8. Ledges and bluffs along Lake Michigan at Gravel Point (Pine River Point, South Point), 1½ miles west of Charlevoix, west line, sec. 28, T. 34 N., R. 8 W., Charlevoix County. Gravel Point formation, *Longispina emmetensis* zone.
14. Quarry of the Penn-Dixie Cement Company, about 1½ miles west of Petoskey, Emmet County. Gravel Point formation, lower Blue shale.
31. Quarry of the Michigan Limestone and Chemical Division of United States Steel Corporation, at Calcite, SE part of T. 35 N., R. 5 E., Presque Isle County. Bell shale.
32. (Grabau locality) ledges along south shore of Long Lake near Summerville, T. 32 N., R. 8 E., Alpena County. Lower part of Genshaw limestone.
37. Shallow abandoned quarry on Hillman Road, about 2 miles west of Alpena Cemetery, SE ¼ SW ¼ sec. 19, T. 31 N., R. 8 E., Alpena County. Potter Farm formation.
38. Abandoned quarry of Kelley's Island Lime and Transport Company, at Rockport, sec. 6, T. 32 N., R. 9 E., Alpena County. Upper part of Bell shale.
41. Exposures along banks and in bed of Thunder Bay River below Four Mile Dam, ¼ mile S center sec. 7, T. 31 N., R. 8 E., Alpena County. Four Mile Dam formation.
49. Abandoned quarry of El Cajon Cement Co., at El Cajon Beach, center W ½ NE ¼ sec. 10, T. 31 N., R. 9 E., Alpena County. Lower part of Genshaw formation.

53. Abandoned quarry of Thunder Bay Quarries Company, eastern edge of Alpena, SE ¼ sec. 14, T. 31 N., R. 8 E., Alpena County. Four Mile Dam limestone.
55. Cut on abandoned railway of Kelley's Island Lime and Transport Company, about 1 mile south of Bell, SW ¼ SW ¼ sec. 24, T. 33 N., R. 8 E., Alpena County. Bell shale.
68. Shale pit at northwest corner of Evergreen Cemetery at west city limits of Alpena, SW ¼ sec. 21, T. 31 N., R. 8 E., Alpena County. Potter Farm formation.

SYSTEMATIC DESCRIPTIONS

Phylum COELENTERATA

Class ANTHOZOA

Order TABULATA

Family Favositidae

Genus *Cladopora* Hall

Cladopora bella, sp. nov.

(Pl. I, Figs. 12–14)

Description.—Corallum dendroid, growing in typical staghorn pattern. Fragmentary stems of coralla ranging from 3 to 5 mm in diameter. Apertures, 0.7 to 1 mm in diameter, relatively thin-walled, funnel-shaped, with moderately sloping peripheral platforms and wide axial pits. In transverse section corallites numbering about 8 or 9 in the diameter of a stem averaging about 0.8 mm in diameter, thin-walled from axis to periphery. In longitudinal section corallites opening at 70 to 75 degrees to the periphery; tabulae absent; mural pores averaging 0.1 mm in diameter, irregularly and widely scattered.

Remarks.—This is a very typical species of *Cladopora* with its thin-walled steeply ascending corallites which lack tabulae. It differs from the type species *C. seriata* Hall in having larger stems with larger corallites with thinner walls. (See Stumm, 1960, pp. 134–35, Pl. I, Figs. 4–6 for description and illustration of the type species of *Cladopora.*)

Occurrence.—Middle Devonian, Traverse group, Bell Shale, locs. 31, 38, 55.

Types.—Holotype No. 37973, Paratype No. 37973*a*, Museum of Paleontology, The University of Michigan.

Cladopora minuta, sp. nov.

(Pl. II, Figs. 13–15)

Description.—Corallum dendritic, composed of round or elliptical stems ranging from 4 to 6 mm in diameter. Apertures subcircular, subpolygonal

or sublunate ranging from 0.2 to 0.3 mm in diameter. Walls of corallites slightly to moderately thickened. Axial pits deep with vertical walls. In transverse section interiors of corallites ranging from 0.3 to 0.5 mm in diameter in axial region where walls are very thin, decreasing to 0.2 to 0.3 mm in diameter in periphery where walls are slightly thickened. From 12 to 14 corallites present in the diameter of a stem. In longitudinal section corallites ascending at a 60 degree angle to the periphery of the stem, the angle becoming steeper axially. No tabulae present.

Remarks.—The species is distinct in the very small size of the corallites and the relatively low angle at which they intercept the surfaces of the stems.

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

Types.—Holotype No. 25244; paratypes No. 25244*a*, 25244*b*, Museum of Paleontology, The University of Michigan.

Genus *Striatopora* Hall

Striatopora linneana Billings

(Pl. I, Figs. 1–4)

Striatopora linneana Billings, 1860, p. 253, text-fig. 1. Nicholson, 1874, p. 59; Rominger, 1876, *partim* p. 39, Pl. 23, Figs. 5, *non* fig. 6; Nicholson, 1879, pp. 100–101, Pl. 5, Figs. 2–2d; Stumm, 1950, card 374.

Description.—Calyxes subpolygonal, with relatively shallow peripheral platforms and narrow axial pits in smaller branches; with steeper calyx walls and larger axial pits in larger branches. Sides of calyx walls provided with 12 low, broad septal ridges. In transverse section corallites averaging about 0.8 mm in diameter, thin-walled in axial region. Walls becoming much thicker, restricting apertures in peripheral region. In longitudinal section tabulae complete, horizontal, irregularly spaced from .5 to over 2 mm apart. Mural pores averaging .2 mm in diameter, irregularly and widely spaced.

Occurrence.—Middle Devonian, Hamilton group, Hungry Hollow formation; Southwestern Ontario. Traverse group, Four Mile Dam formation, localities 41 and 53.

Types.—Syntype No. 3611*f*, National Museum of Canada; Rominger's hypotypes No. 8516, hypotypes herein illustrated Nos. 37796, 37798, and 37799, Museum of Paleontology, The University of Michigan.

Genus *Thamnopora* Steininger

Thamnopora alpenensis (Rominger)

(Pl. II, Figs. 1–4)

Cladopora alpenensis (Rominger), 1876, pp. 51–52, Pl. 20, Fig. 4; Stumm, 1949, Card 148.

Description.—Corallum dendroid, stems branching dichotomously, stems typically round, but may be elliptical in parts of corallum, especially at junctions. Stem ranging from 1 to 2 cm in diameter. Apertures subround to oval or lunate, averaging about 0.8 mm in diameter and opening at an angle of 25 to 30 degrees to the periphery. Thickness of peripheral parts of walls ranging from 0.15 mm to 0.9 mm, averaging 0.5 mm. In transverse section axial parts of corallites thin-walled, periaxial, and peripheral parts becoming progressively thicker. In longitudinal section corallites ascending at about 80 degrees to the periphery, tabulae thin, complete, irregularly spaced, 0.4 mm to 1.5 mm apart, and discernible in axial part of corallite only. Mural pores uniserial, round, averaging about 0.2 mm in diameter, irregularly spaced.

Remarks.—In the lectotype, a few apertures show 20 to 25 faint radial ridges. These may be due to silicification of the specimen which has exposed internal wall structures.

Occurrence.—Middle Devonian, Traverse group, Four Mile Dam limestone localities 41 and 53.

Types.—Lectotype No. 8503; hypotypes Nos. 37793, 37963, 37964, and 37968.

Thamnopora bellensis, sp. nov.
(Pl. I, Figs. 5–7)

Description.—Corallum dendroid, growing in typical staghorn pattern with stems ranging from 6 to over 12 mm in diameter. Corallites inclined upward at a low angle, and with greatly thickened walls in the peripheral region producing rounded apertures ranging from 1 to 1.5 mm in diameter. Apertures separated by distances averaging 1 mm apart. In transverse section axial parts of corallites with relatively thin walls. Between periaxial region and periphery walls greatly thickened producing narrow, rounded apertures. In longitudinal section tabulae relatively horizontal, typically complete. Mural pores relatively large, widely and irregularly spaced.

Remarks.—This species is similar to *T. limitaris* (Rominger) from the coral zone of the Jeffersonville limestone at the Falls of the Ohio but differs in having larger, more widely spaced corallites.

Occurrence.—Middle Devonian; Traverse group, Bell shale, locality 55.

Type.—Holotype No. 37962, Museum of Paleontology, The University of Michigan.

Thamnopora dendroidea, sp. nov.
(Pl. I, Figs. 8–11; Pl. II, Fig. 8)

Description.—Corallum dendroid with round stems ranging from 6 to over 10 mm in diameter. Apertures round or lunate, averaging about 0.8

mm in diameter and opening at a low angle to the periphery. Periaxial and axial parts of walls thickened. Distances between apertures averaging 0.5 mm. In transverse section axial parts of corallites thin-walled. Walls becoming progressively thicker from periaxial to peripheral areas. In longitudinal section corallites ascending from 65 to 70 degrees to the periphery. Tabulae thin, complete, widely and irregularly spaced. Mural pores relatively large, irregularly spaced, apparently confined to axial areas of corallites.

Remarks.—This species is similar to *T. alpenensis* (Rominger) but is distinguished by its rounder corallites which open at a lower angle to the periphery. It is distinguished from *T. limitaris* (Rominger) in that it has a wider axial area with thin corallite walls and greater spacing between the apertures.

Occurrence.—Middle Devonian, Traverse group, Genshaw formation; locality 49 and Grabau's locality 32.

Types.—Holotype No. 37960, paratypes Nos. 37961, 37962, and 37970, Museum of Paleontology, The University of Michigan.

Thamnopora elliptica, sp. nov.
(Pl. II, Figs. 5–7)

Description.—Corallum elliptical, growing in typical staghorn pattern. Corallites inclined upward at angle of 25 to 30 degrees to the periphery, and with moderately thickened walls in the peripheral region producing 0.5 mm to 0.7 mm in diameter. Apertures oval to lunar-shaped and separated by walls averaging 0.15 mm thick. In transverse section axial parts of corallites with walls slightly thinner than those of peripheral region. Corallites subrounded polygonal, ranging in diameter from 0.2 mm to 0.7 mm, averaging 0.5 mm. In longitudinal section tabulae thin, typically complete and broken, ranging from 0.15 mm to 0.9 mm apart, averaging 0.5 mm. Mural pores about 0.1 mm in diameter, widely and irregularly spaced.

Remarks.—The characteristic feature of this species is its pronouncedly elliptical coralla and the palmate form at the base of the branches. This species is distinguished from other species of *Thamnopora* in having elliptical coralla, more abundant and closely spaced tabulae, and thinner walls which vary little in thickness between the axial and peripheral regions of the corallum.

Occurrence.—Middle Devonian, Traverse group, Potter Farm formation; locality 37.

Types.—Holotype No. 37800; paratype No. 37800*a*, Museum of Paleontology, The University of Michigan.

Thamnopora magniventra, sp. nov.
(Pl. II, Figs. 9–12)

Striatopora rugosa Rominger, 1876, p. 59, Pl. 24, Fig. 2, *non Striatopora rugosa* Hall, 1851 = *Striatopora iowensis* (Owen), 1844.

Description.—Corallum dendritic stems ranging from 0.5 to almost 2 cm in diameter. Calyxes prominent, lunate to subround ranging from 2 to 3 mm in maximum diameter. Calyxes smooth with moderately to steeply sloping walls and wide axial pits. Walls between calyxes thick and smooth. In transverse section corallites small axially, larger peripherally, subround, with relatively thin walls axially and thick walls peripherally. In longitudinal section corallites steeply inclined, rising at almost 80 degrees to the periphery. Corallites with the walls axially rapidly thickening periaxially and peripherally to occupy over 50 per cent of space. Tabulae irregularly arranged, some horizontal, some inclined, some incomplete, starting from one wall and becoming deflected proximally to attach to lower tabula. Mural pores relatively large, irregularly and widely spaced.

Remarks.—Rominger compared this species to *Striatopora rugosa* Hall but it differs from this species in having no septal ridges in the calyxes.

Occurrence.—Middle Devonian, Traverse group, Four Mile Dam formation, localities 41 and 53, Gravel Point formation, localities 8 and 14.

Types.—Holotype No. 37794; paratypes No. 37794*a*, 37794*b*, Museum of Paleontology, The University of Michigan.

Thamnopora potterensis, sp. nov.
(Pl. I, Figs. 15–17)

Description.—Corallum dendritic composed of relatively even-sized stems averaging about .7 mm in diameter. Corallites with lunate to subround apertures averaging a little less than 1 mm in maximum diameter, with relatively shallow peripheral platforms and narrow axial pits. Apertures separated by walls averaging 0.5 mm thick. In transverse section corallites numerous, small, thin-walled axially, thick-walled peripherally. An average of 10 corallites present in the diameter of a stem. In longitudinal section corallites rising at about a 70 degree angle to the periphery. Corallites with thin walls axially becoming thickened peripherally to occupy over 50 per cent of the space. Tabulae well developed, horizontal, irregularly spaced from 0.3 to almost 4 mm apart. Mural pores large, averaging 0.2 mm in diameter, irregularly spaced.

Remarks.—This distinctive species has more lunate apertures than *T. alpenensis* and the stems and corallites are somewhat smaller.

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

Types.—Holotype No. 37966; paratype No. 37972, Museum of Paleontology, The University of Michigan.

LITERATURE CITED

OWEN, D. D. 1844. Description of some organic remains. . . . 28th Congress, Senate Document No. 407, pp. 69–86, pls. XI–XVIII.

HALL, JAMES. 1851. Natural History of New York, Part VI. Paleontology of New York, Vol. II, viii + 363 pp., 85 pls.

ROMINGER, CARL. 1876. Paleontology. Fossil Corals. Geol. Surv. Mich., Vol. 3, Pt. 2, 161 pp., IV pls.

STUMM, E. C. 1960. The Type Species of the Paleozoic Tabulate Coral Genera *Cladopora* and *Coenites*. Contrib. Mus. Paleontol., Univ. Mich., Vol. XV, No. 7, pp. 133–38, 1 pl.

Manuscript received May 4, 1961

PLATES

EXPLANATION OF PLATE I

Sections × 4; exteriors × 1

PAGE

Striatopora linneana Billings 278

FIG. 1. Side view of stem of average width. Hypotype No. 37799. Four Mile Dam limestone, locality 41.

FIG. 2. Side view of large, bifurcating corallite stem showing well-developed septal ridges in calyxes. Hypotype No. 37796. Four Mile Dam limestone, locality 14.

FIG. 3. Transverse section of a specimen showing thin axial and thick peripheral corallites. Hypotype No. 37798. Four Mile Dam limestone, locality 41.

FIG. 4. Longitudinal section of same specimen showing tabulae and mural pores.

Thamnopora bellensis, sp. nov. 279

FIG. 5. Side view of a stem showing round apertures and thick walls. Holotype No. 37962. Bell shale, locality 55.

FIG. 6. Longitudinal section of same specimen showing broken tabulae and corallite walls thickening peripherally.

FIG. 7. Transverse section of same specimen showing extreme wall thickening of peripheral parts of corallites.

Thamnopora dendroidea, sp. nov. 279

FIG. 8. Typical stem showing two bifurcations. Holotype No. 37960. Genshaw formation, locality 49.

FIG. 9. Short stem showing thickened walls and round apertures. Paratype No. 37961, Genshaw formation, Grabau's locality 32.

FIG. 10. Transverse section of a typical stem showing closely packed corallites with thick peripheral areas. Paratype No. 37962. Genshaw formation, locality 49.

FIG. 11. Longitudinal section of same specimen showing tabulae, mural pores, and corallites intercepting periphery at a relatively low angle.

Cladopora bella, sp. nov. 277

FIG. 12. Side view of a typical stem. Holotype No. 37973. Bell shale, locality 31.

FIG. 13. Transverse section of a stem showing thin-walled, even-sized corallites. Paratype No. 37973*a*. Bell shale, locality 31.

FIG. 14. Longitudinal section of same specimen showing steeply inclined thin-walled corallites lacking tabulae.

Thamnopora potterensis, sp. nov. 281

FIG. 15. Bifurcating stem showing sublunate apertures. Holotype No. 37966. Potter Farm formation, locality 68.

FIG. 16. Transverse section showing corallites with peripheral thickening. Paratype No. 37972. Potter Farm formation, locality 68.

FIG. 17. Longitudinal section of same specimen showing well-developed tabulae and mural pores.

PLATE I

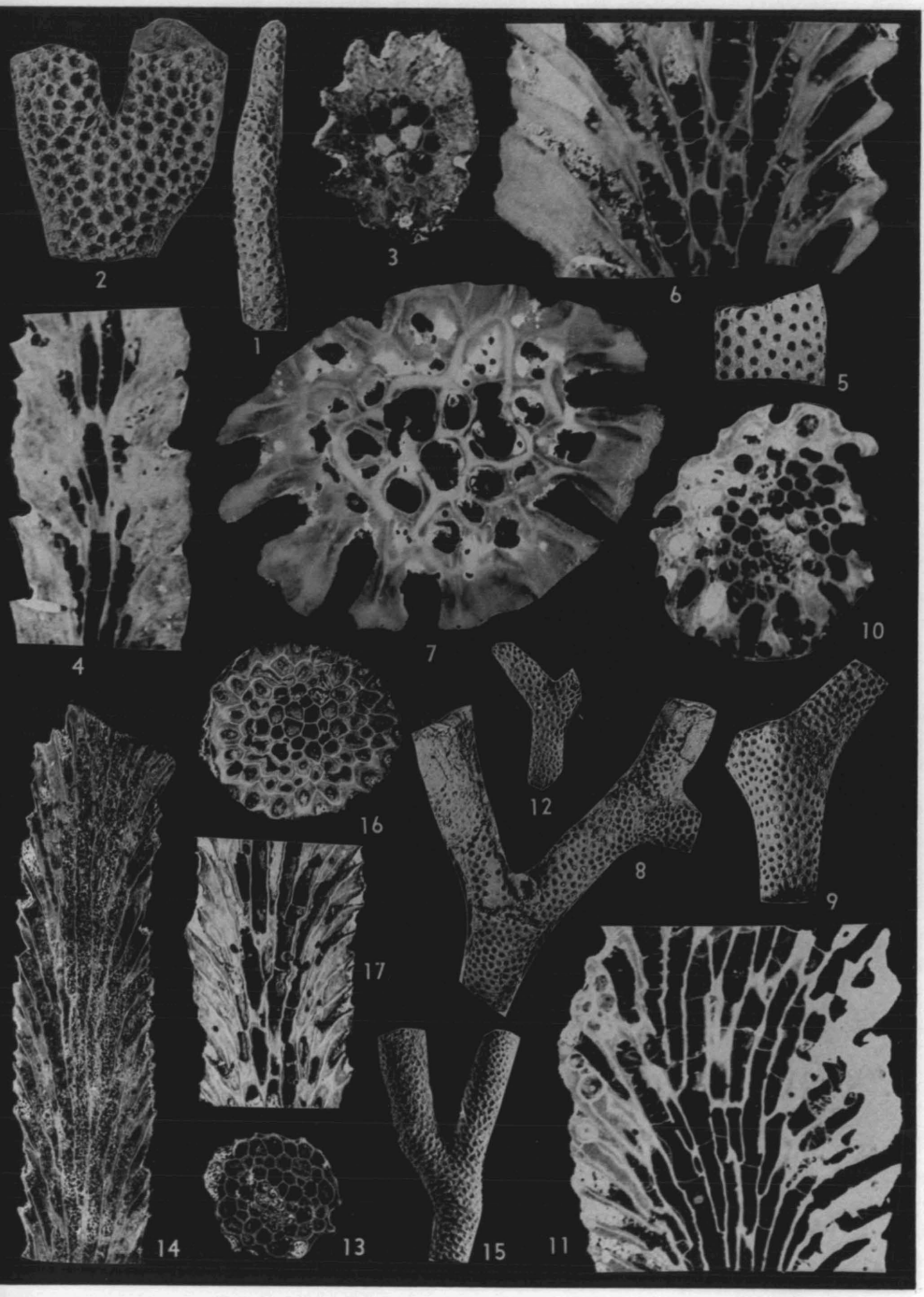
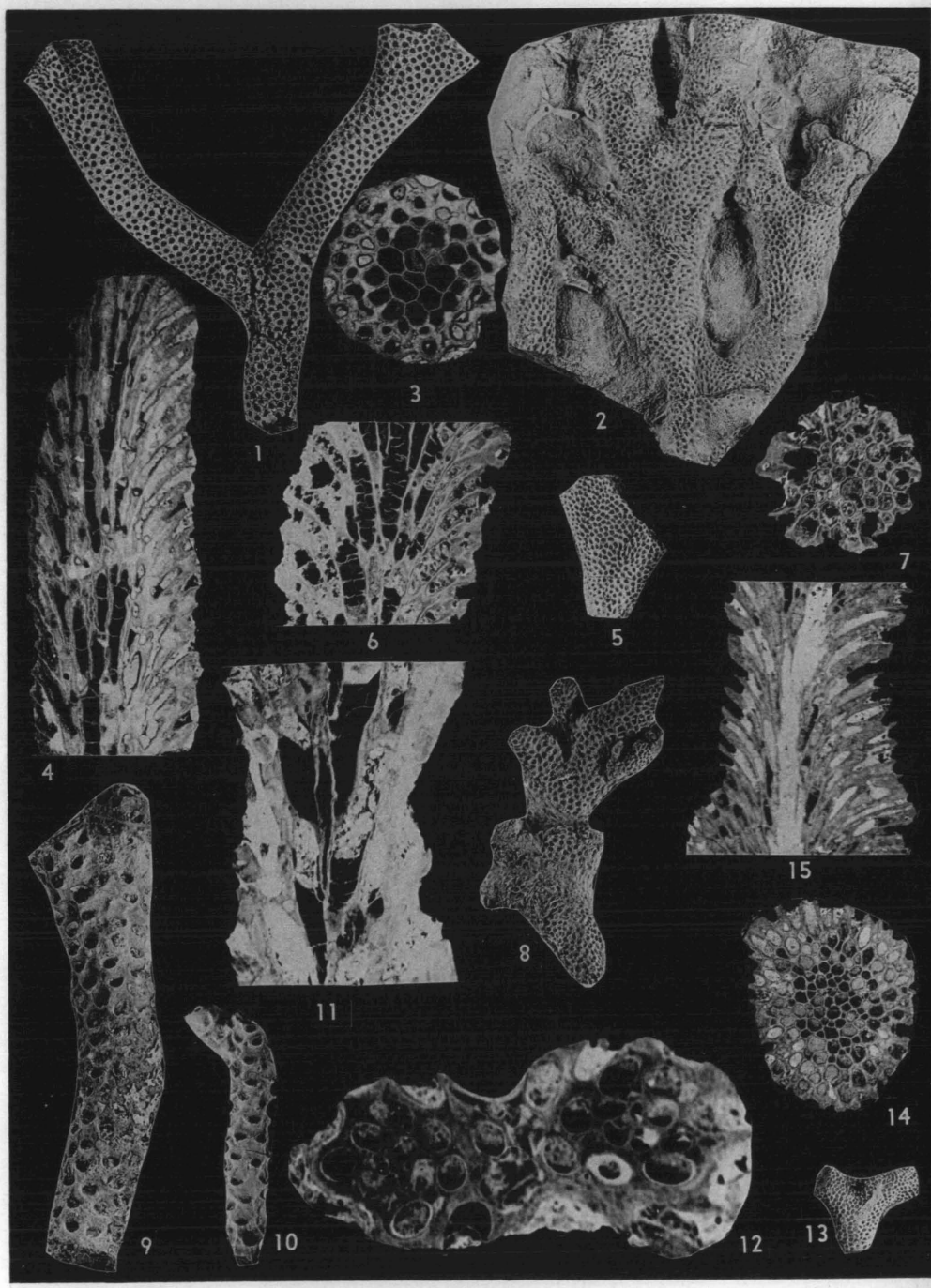


PLATE II



EXPLANATION OF PLATE II

Sections × 4; exteriors × 1

PAGE

Thamnopora alpenensis (Rominger) 278

FIG. 1. Side view of silicified bifurcating stem showing lunate apertures and thick walls. Lectotype No. 8503. Four Mile Dam formation, vicinity of locality 53.

FIG. 2. Unsilicified specimen showing multiple branching. Hypotype No. 37964, Four Mile Dam limestone, locality 53.

FIG. 3. Transverse section of a stem showing corallites with walls thickening Peripherally. Hypotype No. 37793. Four Mile Dam limestone, locality 53.

FIG. 4. Longitudinal section of a specimen showing tabulae and mural pores. Hypotype No. 37968. Four Mile Dam limestone, locality 53.

Thamnopora elliptica, sp. nov. 280

FIG. 5. Side view of elliptical stem just below point of bifurcation. Holotype No. 37800. Potter Farm formation, locality 37.

FIG. 6. Longitudinal section of a specimen showing relatively closely set, broken tabulae and corallite walls thickening peripherally. Paratype No. 37800*a*. Potter Farm formation, locality 37.

FIG. 7. Transverse section of same specimen showing peripheral thickening of corallite walls.

Thamnopora dendroidea, sp. nov. 279

FIG. 8. Side view of multiple branching corallum with sublunate apertures. Paratype No. 37970. Genshaw formation, Grabau's locality 32.

Thamnopora magniventra, sp. nov. 281

FIG. 9. Side view of large stem showing large, lunate calyxes. Holotype No. 37794. Four Mile Dam formation, locality 53.

FIG. 10. Side view of smaller stem. Paratype No. 37794*a*. Four Mile Dam formation, locality 53.

FIG. 11. Longitudinal section of a specimen showing thick walls and irregular tabulae. Paratype No. 37794*b*. Four Mile Dam formation, locality 53.

FIG. 12. Transverse section of same specimen at point of bifurcation showing thick-walled corallites.

Cladopora minuta, sp. nov. 277

FIG. 13. Bifurcating stem showing small rounded apertures. Holotype No. 25244. Potter Farm formation, locality 68.

FIG. 14. Transverse section of a specimen showing small subpolygonal corallites becoming rounded with thicker walls peripherally. Paratype No. 25244*a*. Potter Farm formation, locality 68.

FIG. 15. Longitudinal section of same specimen showing corallites without tabulae ascending at a relatively low angle.