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CORALS OF THE TRAVERSE GROUP OF  
MICHIGAN PART XII, THE SMALL-CELLED  
SPECIES OF *FAVOSITES* AND *EMMONSIA*

BY

ERWIN C. STUMM and JOHN H. TYLER



MUSEUM OF PALEONTOLOGY  
THE UNIVERSITY OF MICHIGAN  
ANN ARBOR, MICHIGAN

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VOLS. II-XVIII. Parts of volumes may be obtained if available.

## VOLUME XIX

1. Silicified Trilobites from the Devonian Jeffersonville Limestone at the Falls of the Ohio, by Erwin C. Stumm. Pages 1-14, with 3 plates.
2. Two Gastropods from the Lower Cretaceous (Albian) of Coahuila, Mexico, by Lewis B. Kellum and Kenneth E. Appelt. Pages 14-22.
3. Corals of the Traverse Group of Michigan, Part XII, The Small-celled Species of *Favosites* and *Emmonsia*, by Erwin C. Stumm and John H. Tyler. Pages 23-36, with 7 plates.

CORALS OF THE TRAVERSE GROUP OF MICHIGAN  
 PART XII, THE SMALL-CELLED SPECIES OF  
*FAVOSITES* AND *EMMONSIA*<sup>1</sup>

BY  
 ERWIN C. STUMM and JOHN H. TYLER

ABSTRACT

The species *Favosites clausus* Rominger, *Favosites digitatus* Rominger, and *Favosites nitellus* Winchell are redescribed and refigured. The new species *Favosites mammillatus*, *Favosites norwoodensis*, and *Emmonsia alpenensis* are described and illustrated. The internal structures of Winchell's and Rominger's species are figured for the first time.

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<sup>1</sup> Part I is published in the *Contributions from the Museum of Paleontology*, The University of Michigan, 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; Part VI in Vol. XVI, No. 4; Part VII in Vol. XVII, No. 9; Part VIII in Vol. XVII, No. 10; Part IX in Vol. XVII, No. 12; Part X in Vol. XVII, No. 14; and Part XI in Vol. XVIII, No. 8.

## INTRODUCTION

PART XII of the study of the corals of the Traverse Group of Michigan concerns the description and illustration of the small-celled species of *Favosites* and *Emmonsia*. By small-celled is meant those species in which the diameters of mature corallites range from 0.3 to 1.3 mm in diameter.

## PREVIOUS WORK

Alexander Winchell (1866) described *Favosites nitellus*, without illustrations from the Gravel Point Formation of the Little Traverse Bay region.

Rominger (1876) figured specimens of *F. nitellus* and described and figured *F. clausus* and *F. digitatus*. He also described *F. placenta* from the Hungry Hollow Formation of Ontario and the Four Mile Dam Formation of Michigan. The specimen from the latter formation is removed from *F. placenta* and is the holotype of our new species *F. mammilatus*. Rominger also described *F. radiformis* from the Jeffersonville limestone of the Falls of the Ohio, from Onondaga Limestone drift in Michigan and from the Alpena Limestone. The specimens from the Alpena Limestone are removed from *F. radiformis* and form paratypes of our new species *Emmonsia alpenensis*.

David Swann (1947), made an excellent study of the larger celled species of *Favosites*, the *Favosites alpenensis* lineage.

## ACKNOWLEDGMENTS

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

## LOCALITIES

- The locality numbers indicated below are those used by The University of Michigan Museum of Paleontology and the Michigan Geological Survey.
- 7c. Ledges and bluffs along Lake Michigan extending from point shore at locality 7a to point  $\frac{1}{2}$  mile north, Charlevoix Co., NE  $\frac{1}{4}$  sec. 27, and SE  $\frac{1}{4}$  sec. 22, T.33 N., R.9 W.
  - 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.
  - 14e. Abandoned "Bell" quarry and ledges on shore about 2 miles east of Bay Shore, Emmet County. Near NE. corner sec. 8, T.34 N., R.6 W. (Rose quarry of Fenton and Fenton, 1930.)

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 US 31 one mile east of Bay View, Emmet Co. SE.  $\frac{1}{4}$  SW.  $\frac{1}{4}$  sec. 27, T.35 N., R.5 W.
  31. Quarry of Michigan Limestone and Chemical Company at Calcite, Presque Isle County. Site of Crawford's Marble quarry. 10 sections in SE. part T.35 N., R.5 E., and adjacent townships.
  35. Bluffs on north east 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.
  38. Abandoned quarry of Kelley's Island Lime and Transport Company (Great Lakes Stone and Lime Company) at Rockport, Alpena Co., sec. 6, T.32 N., R.9 E.
  40. Quarry of Michigan Alkali Company, eastern edge of Alpena, Alpena County. Sec. 13, T.31 N., R.8 E.
  41. Exposures on banks and in bed of Thunder Bay River below Four Mile Dam, Alpena County.  $\frac{1}{4}$  mile S. 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, and Broadwell's Saw Mill.
  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.
  58. Ditches beside road at southern tip of Long Lake, Alpena County. NE.  $\frac{1}{4}$ , sec. 22, T.32 N., R.8 E.
  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.
  92. Road cuts and ditches on northwest side of Orchard Hill, extending from corner  $\frac{3}{4}$  miles north of Orchard Hill bridge, for  $\frac{1}{4}$  mile eastward toward Orchard Hill School, Alpena County. N. line NW.  $\frac{1}{4}$  sec. 31, T.32 N., R.7 E.
  95. Abandoned "Griffin" or "Bolton" limestone quarry and adjacent field outcrops, on southwest side of Detroit and Mackinac R.R. tracks about  $1\frac{1}{4}$  miles northwest of Bolton, Alpena County, SE.  $\frac{1}{4}$  SW.  $\frac{1}{4}$  sec. 5, T.32 N., R.7 E.
- Winchell's and Rominger's types can be located only by general area.

## SYSTEMATIC DESCRIPTIONS

## Phylum COELENTERATA

## Class ANTHOZOA

## Order TABULATA

## Family Favositidae

Genus *Favosites* Lamarck

*Favosites* Lamarck, 1816, p. 204.

*Type species*.—By subsequent designation of Edwards and Haime, 1850, p. 1x, *F. gothlandicus* Lamarck, 1816, p. 205, Silurian, Gotland, Sweden.

*Favosites clausus* Rominger

(Pl. II, Fig. 7; Pl. VI, Figs. 5-6)

*Favosites clausus* Rominger 1876 *partim*, pp. 37-38, Pl. 14, upper tier, left-hand figure, *non* right-hand figure, *non* lower tier; Nicholson, 1879, p. 75, Pl. 4, Figs. 1a-c; Stumm, 1949, Cards 237-238.

*Favosites goodwini* Davis, 1887, Pl. 25, Figs. 1-9; Stumm, 1950, Cards 263-264.

*Favosites placenta* forma *ramosa* Ross, 1953, pp. 71-72, Pl. 20, Figs. 1-3.

*Description.*—Corallum digitate, branches typically subparallel but some divergent. Branches round or elliptical in outline. Width of branches ranging from 6 to 11 mm. Corallites dimorphic, larger ones typically round to subround, smaller ones subround to subpolygonal. Diameters of corallites ranging from 0.3 to 0.8 mm. In transverse section corallites thin-walled, an average of 11 corallites in the diameter of one branch. No trace of squamulae present. In longitudinal section tabulae complete, horizontal, relatively evenly spaced at an average distance of 0.6 mm apart. Mural pores uniserial, circular, averaging 0.2 mm in diameter and separated by distances averaging 1 mm apart.

*Remarks.*—This is a widespread species occurring typically in rocks of Centerfield age in New York, the Ohio Valley, southwestern Ontario, and the Michigan Basin.

*Occurrence.*—Middle Devonian, Traverse group, Four Mile Dam Formation, loc. 41, Michigan; Hamilton group, Ludlowville Formation, New York; Hungry Hollow Formation, coral bed, southwestern Ontario. Beechwood Limestone, southern Indiana and northern Kentucky.

*Types.*—Lectotype (chosen by Stumm, 1949, Card 237), UMMP 8477.

#### *Favosites digitatus* Rominger

(Pl. I, Figs. 4-5; Pl. III, Figs. 3-4; Pl. IV, Figs. 4-6; Pl. VI, Figs. 5-6)

*Favosites digitatus* Rominger 1876, *partim*, pp. 39-40, Pl. 15, lower-tier, six right-hand figures; Stumm, 1949, Card 197.

*Description.*—Corallum digitate, branches typically divergent. Width of mature branches ranging from 8 to 14 mm. Corallites dimorphic, larger ones typically round to subround, smaller ones subround to polygonal. Diameters of corallites ranging from 0.3 to 0.7 mm. In transverse section corallites of the axial region thin-walled, those of the peripheral region thick-walled, an average of 8 corallites in the diameter of one branch. Squamulae absent. In longitudinal section tabulae complete, horizontal, and relatively evenly spaced at an average distance of 0.9 mm apart. Mural pores uniserial, circular, averaging 0.1 mm in diameter and unevenly spaced at distances averaging about 2 mm apart.

*Remarks.*—In the original description by Rominger the presence of lateral squamulae was mentioned. No traces of squamulae were observed in the thin sections herein described. The species is similar to *F. clausus* but differs in the digitate growth habit; the lack of dimorphic corallites; and the larger average size of the corallites.

*Occurrence.*—Middle Devonian, Traverse group, Bell Shale, locs. 31 and 38, Genshaw Formation, loc. 58, Alpena Limestone, and Four Mile Dam Formation, Michigan.

*Types*.—Lectotype UMMP 8484; Paratype UMMP 8484a, Hypotypes Nos. 37950, 46933, 47974, 47975, and 47976.

***Favosites mammillatus* sp. nov.**

(Pl. I, Figs. 1-2, 8; Pl. II, Figs. 1-2, 6, 8; Pl. III, Figs. 1-2; Pl. IV, Figs. 1-2; Pl. V, Fig. 6; Pl. VII, Figs. 3-4)

*Favosites placenta* Rominger, 1876, p. 34, *partim*, Pl. 11, Fig. 3, *non* Figs. 1-2.

*Description*.—Corallum massive, low hemispherical to laminate, complete coralla typically subcircular in outline. Upper surface of corallum typically with circular or elliptical mammillate swellings. Corallites polygonal to subrounded, ranging from 0.3 to 0.9 mm in diameter with an average of 0.7 mm. Walls of variable thickness; where thicker a subrounded appearance of the aperture is produced. Tabulae typically incomplete, thin, wrinkled, and closely set. A few squamulae may be present. Mural pores typically uniserial, round, about 0.2 mm in diameter.

*Remarks*.—Superficially this species resembles *F. placentus* Rominger from the Hungry Hollow Formation of Ontario but it differs in possessing mammillate swellings on the distal surfaces of the coralla and having the closely set, typically incomplete, wrinkled tabulae. It also resembles *F. nitellus* Winchell but differs in growth form and in having more widely spaced tabulae.

*Occurrence*.—This species is widespread, occurring in almost every formation of the Traverse Group in the Alpena region. Bell Shale, locs. 31 and 38; Ferron Point Formation, locs. 38 and 51; Genshaw Formation, locs. 40 and 58; Alpena Limestone, locs. 40, 53, and 95; Four Mile Dam Limestone, loc. 41; Potter Farm Formation, locs. 68 and 92; Thunder Bay Limestone, loc. 35.

*Types*.—Holotype No. 8468 (Rominger's syntype of *Favosites placentus*, 1876, Pl. 1, Fig. 3); hypotypes No. 37977, 37978, 37984, 46930, 46931, 47085, 47088, 47089, and 47093.

***Favosites nitellus* Winchell**

(Pl. II, Figs. 3-4; Pl. VI, Figs. 3-4; Pl. VII, Figs. 1-2)

*Favosites nitella* Winchell, 1866, p. 89; Rominger, 1876, p. 33, Pl. 11, Fig. 4 (lower right-hand quadrant); Stumm, 1950, Card 281.

*Description*.—Corallum subglobular, irregularly nodose, or subdendritic. Corallites polygonal or subpolygonal, thin-walled, mature corallites ranging from 0.5 to 1.3 mm with an average of 0.8 mm. Young corallites appearing at junctions of corallites and ranging from 0.1 to 0.5 mm in diameter. Mural pores round, typically uniserial, averaging 0.2 mm in diameter and separated by distances averaging 0.7 mm. Tabulae complete

or incomplete, horizontal, inclined, or arched, spaced from 0.1 to 0.8 mm apart.

*Remarks.*—This species has previously been known only by its external features. It is common in the shaly beds of the middle part of the Traverse Group. The internal structures of *F. nitellus* are similar to *F. mammillatus* except that the corallites are typically thinner walled; the tabulae are typically more widely spaced and a larger percentage of them are complete. The external growth form is quite distinct.

*Occurrence.*—Middle Devonian, Traverse group, Gravel Point Formation, locs. 14 and 14e; Alpena Limestone, locs. 40 and 53.

*Types.*—Lectotype No. 24725; paralectotype No. 24725a; hypotypes Nos. 14367, 25234, and 47092.

#### *Favosites norwoodensis* sp. nov.

(Pl. II, Fig. 5; Pl. VI, Figs. 1–2)

*Description.*—Corallum flattened, palmate in basal part, becoming flattened digitate distally. Corallites polygonal, thin-walled, with an average diameter of 0.7 mm. Tabulae typically complete and relatively widely spaced from 0.8 mm to 2.5 mm apart in the axial region, becoming incomplete and much more closely set in the peripheral region. Mural pores uniserial, about 0.2 mm in diameter, spaced about 11 mm apart.

*Remarks.*—This species superficially resembles *F. digitatus*, but can be distinguished by the flatter corallum and by the dimorphic tabulae.

*Occurrence.*—Middle Devonian, Traverse group, Upper Petoskey Limestone, *Favosites* bed just above *Atrypa* bed, loc. 7c.

*Types.*—Holotype No. 37802, paratype No. 37801.

#### Genus *Emmonsia* Edwards and Haime

*Emmonsia* Edwards and Haime, 1851, pp. 152, 246.

*Type species.*—By subsequent designation of Römer, 1883, p. 425, *Favosites hemispherica* Edwards and Haime, 1851, p. 247 (*non F. hemispherica* Yandell and Shumard 1847, p. 9) = *Favosites emmonsii* Rominger, 1876, p. 27, Pl. VII, Fig. 1, *non* Fig. 2. Middle Devonian, Jeffersonville Limestone, Falls of the Ohio.

#### *Emmonsia alpenensis* sp. nov.

(Pl. I, Figs. 3, 6–7; Pl. III, Figs. 5–6; Pl. IV, Fig. 3; Pl. V, Figs. 1–5; Pl. VII, Figs. 5–6) *Favosites radiciformis* Rominger, 1876, *partim*, pp. 34–35, Pl. 12, lower tier, two left-hand specimens.

*Description.*—Corallum palmate near base becoming digitate distally. Digitate branches elliptical in outline near base, becoming rounded at upper ends. Diameters of branches ranging from 1 to 3 cm. Corallites



polygonal to subpolygonal ranging from 0.3 to 1.2 mm and averaging 0.7 mm in diameter. In transverse section corallites thin-walled in axial portion where they are directed distally. In the peripheral area they are horizontally directed and have numerous squamulae. In longitudinal section the tabulae are typically thin, complete, or incomplete, and overlapping in the axial area. In the peripheral area they are masked by numerous squamulae. The mural pores are typically uniserial, rarely biserial, ranging from 0.1 mm to 0.15 mm in diameter, and separated by distances averaging 1.0 mm apart.

*Occurrence.*—Middle Devonian, Traverse group, widespread in most formations in the Thunder Bay region and more rarely in the Little Traverse Bay region. Figured specimens from the Bell Shale, Rockport Quarry Limestone, Genshaw Formation, Alpena Limestone, Potter Farm Formation, and Petoskey Limestone.

*Types.*—Holotype No. 37955, Paratypes Nos. 8471, 37804, 37948, 37953, 37954, 37956, 47091, and 47973.

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## EXPLANATION OF PLATE I

(All figures  $\times 1$ )

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FIG. 1. Distal view of a specimen with low mammillate swellings. Paratype No. 47085, Ferron Point Formation, locality 51.	
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PLATE I



PLATE II



## EXPLANATION OF PLATE II

(All figures  $\times 1$ )

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## EXPLANATION OF PLATE III

(All figures  $\times 4$ )

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PLATE III

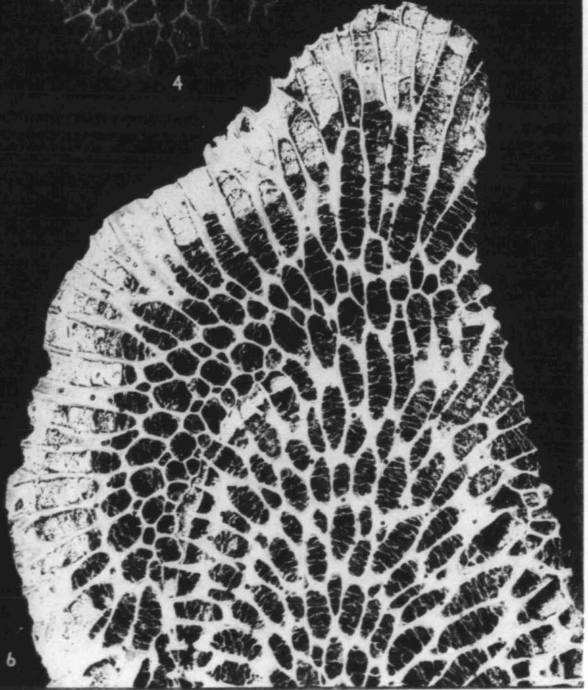
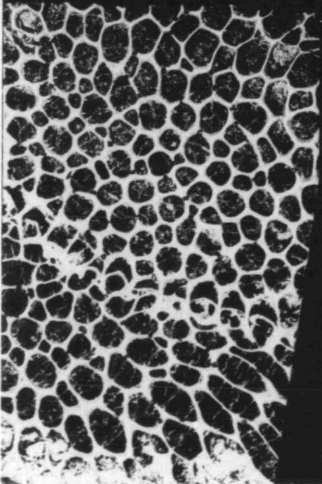
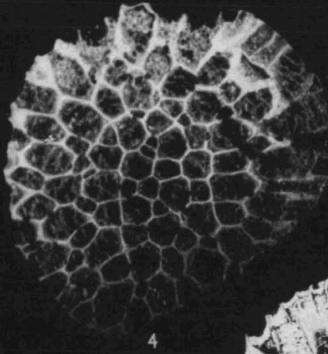
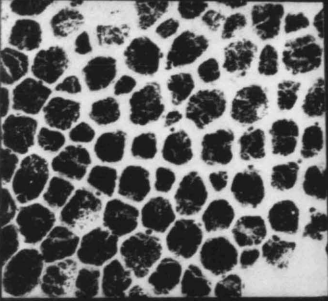
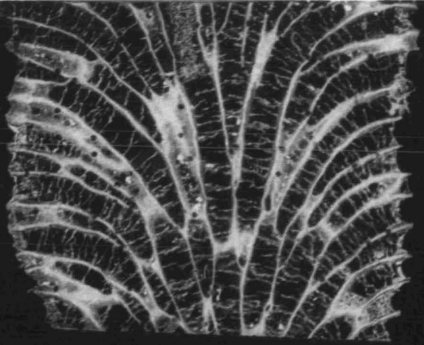
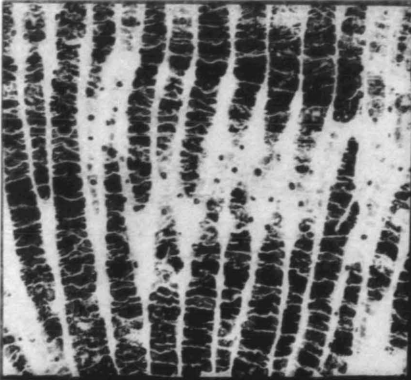
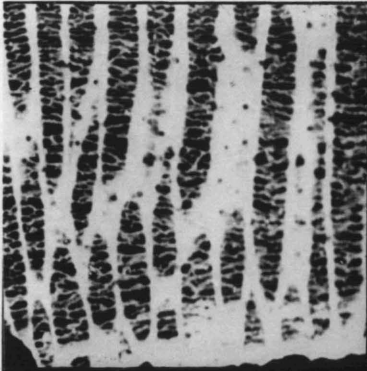
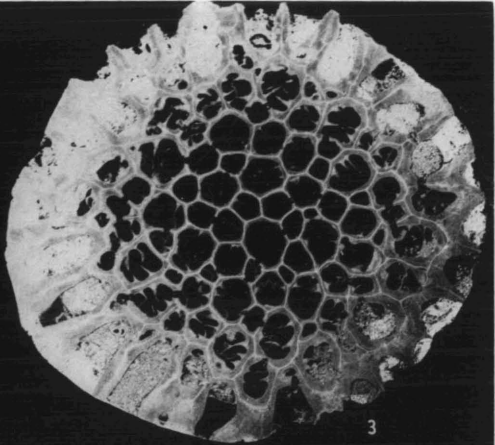


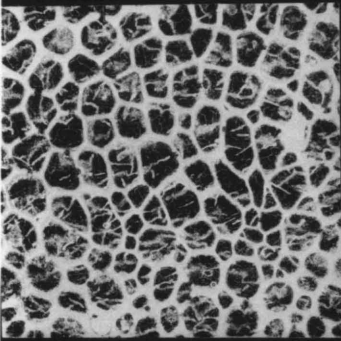
PLATE IV



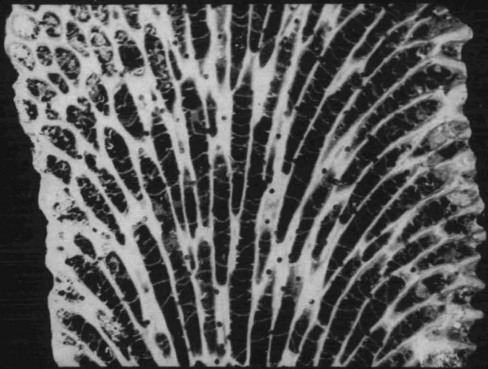
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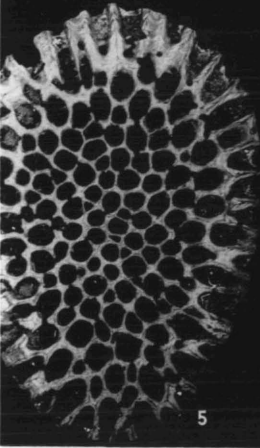
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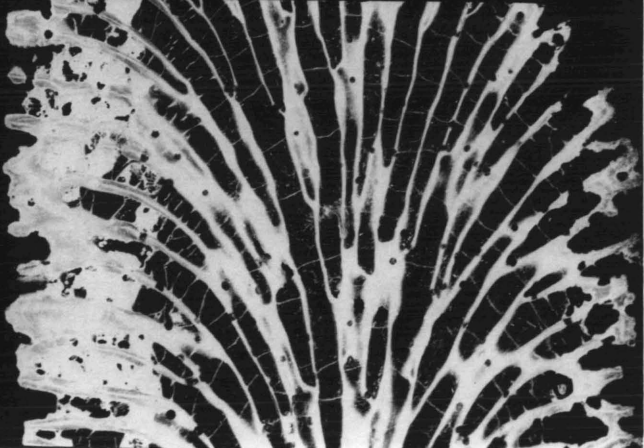
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4



5



6



## EXPLANATION OF PLATE IV

(All figures  $\times 4$ )

	PAGE
<i>Favosites mammillatus</i> sp. nov. ....	27
FIG. 1. Longitudinal section showing mural pores and closely set wrinkled tabulae. Paratype No. 37977. Genshaw Formation, locality 40.	
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## EXPLANATION OF PLATE V

(All figures  $\times 4$ )

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PLATE V

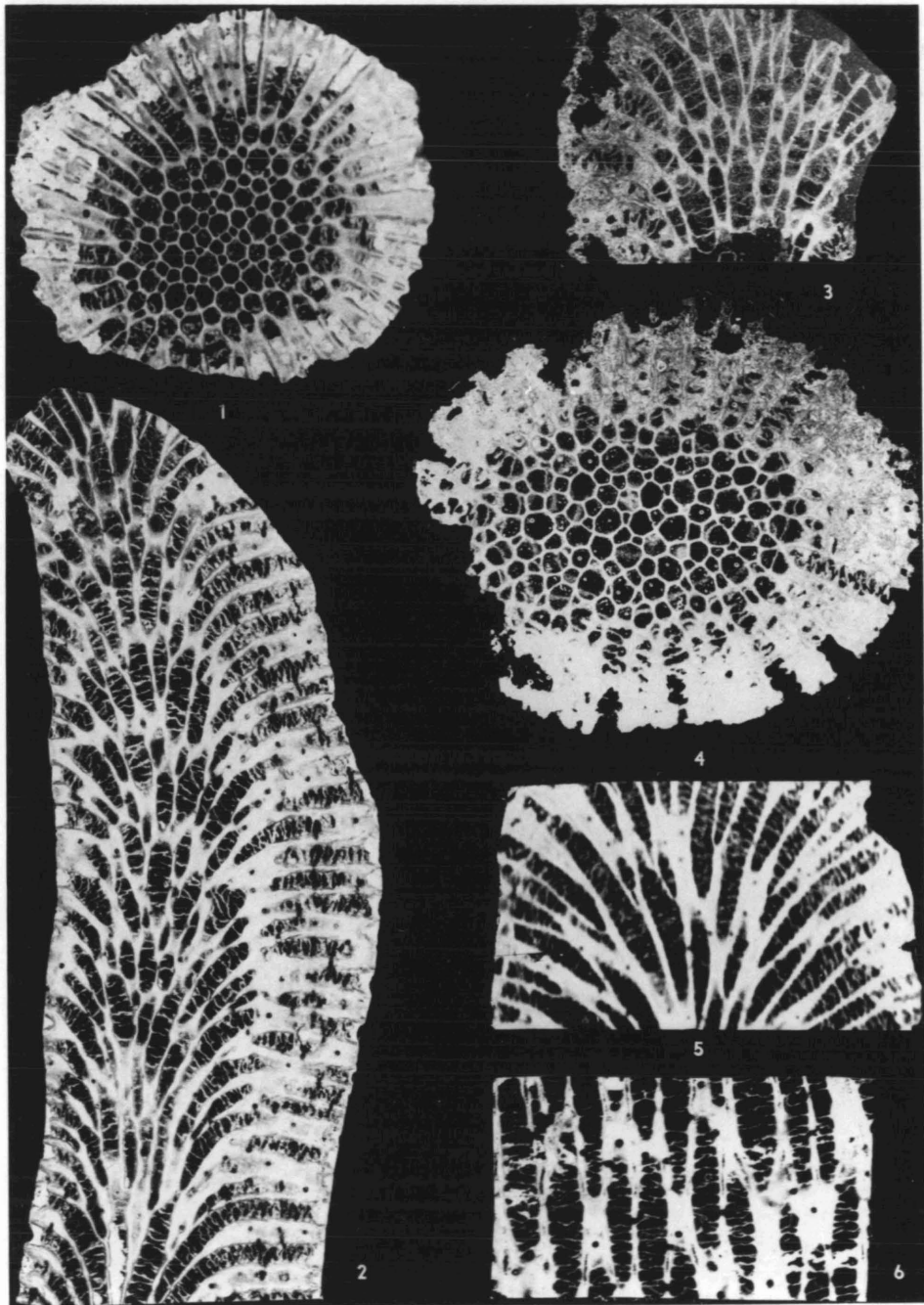
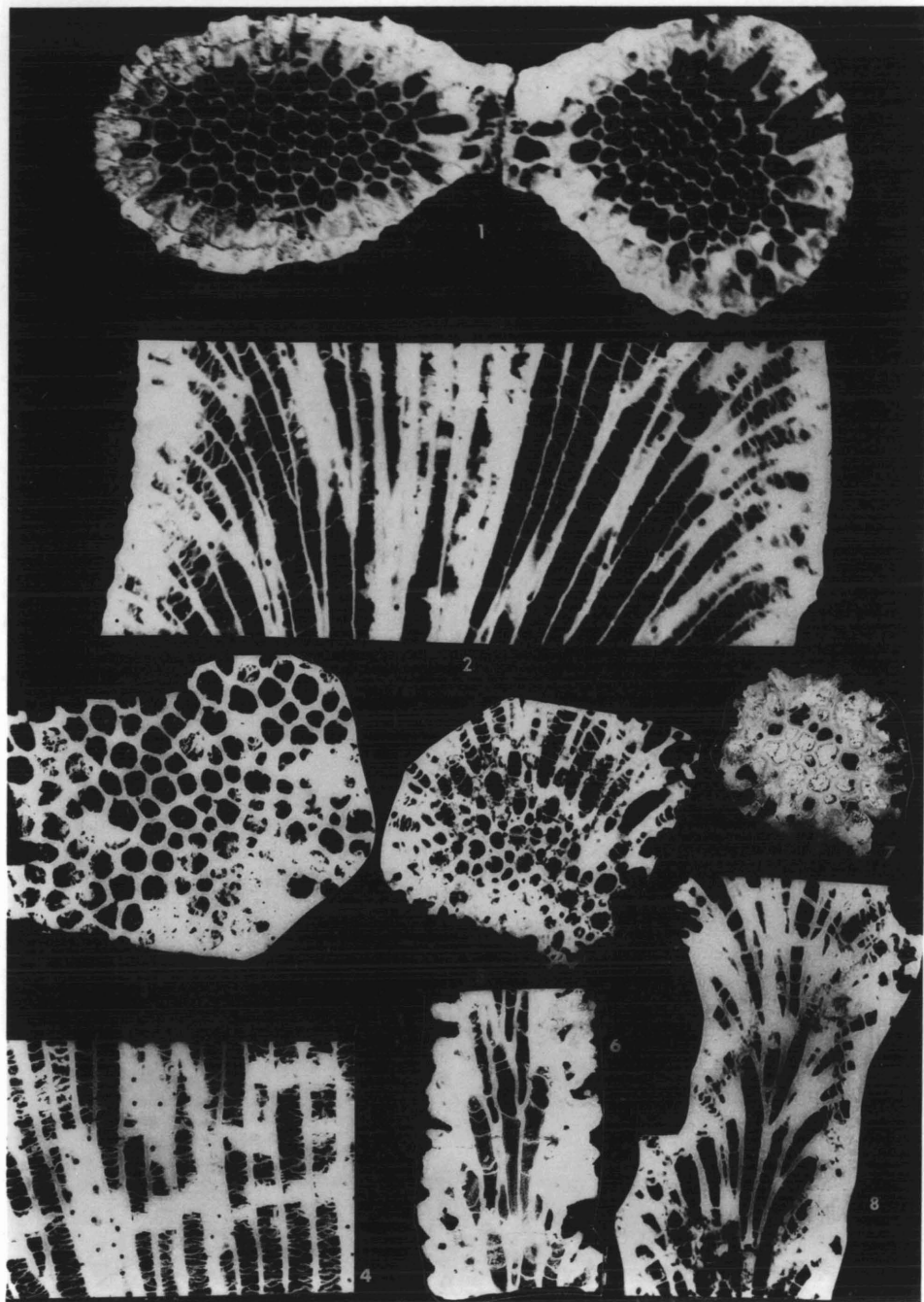


PLATE VI



## EXPLANATION OF PLATE VI

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PLATE VII

