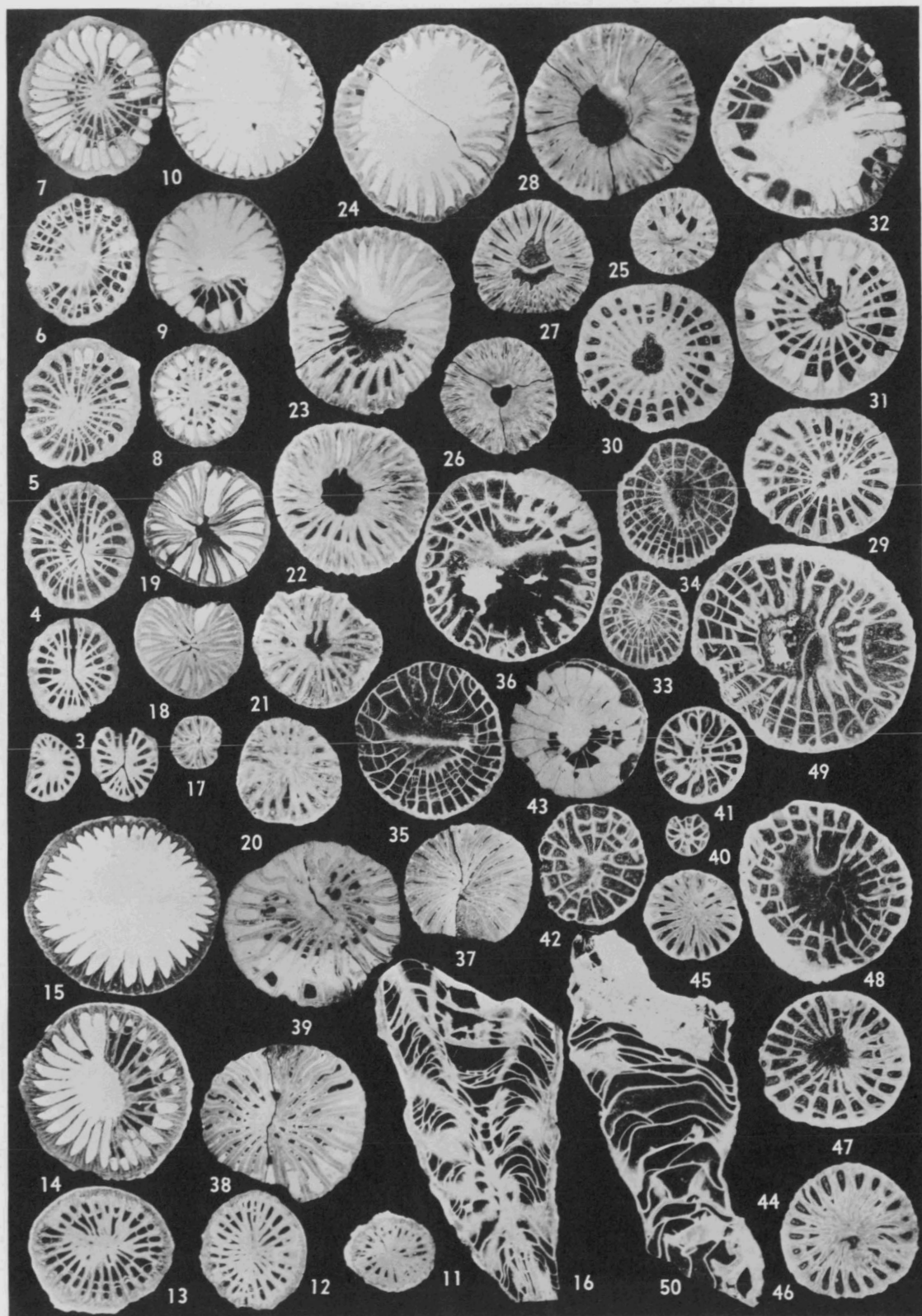


THE METRIOPHYLLOID CORAL GENERA
STEREOLASMA, *AMPLEXIPHYLLUM*, AND
STEWARTOPHYLLUM FROM THE
DEVONIAN HAMILTON GROUP
OF NEW YORK

BY
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THE METRIOPHYLOID CORAL GENERA *STEREOLASMA*,
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THE DEVONIAN HAMILTON GROUP OF NEW YORK

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ABSTRACT—Daniel Busch (1941, p. 392-411) described 6 new species of metriophylloid rugose corals from the Wanakah and Windom shales of the Hamilton group of western New York. After an examination of many serial sections of specimens from these beds it is suggested that Busch's species can be interpreted as growth stages or variants of the three common species *Stereolasma rectum* (Hall), *Amplexiphyllum hamiltoniae* (Hall), and *Stewartophyllum intermittens* (Hall).

INTRODUCTION AND ACKNOWLEDGMENTS

DANIEL BUSCH (1941) identified nine species of metriophylloid corals, six of them new, from two localities in the Wanakah shale and one locality in the Windom shale, both in the Middle Devonian Hamilton group of western New York. A large number of corals from these localities were obtained when the University of Michigan purchased the Raymond R. Hibbard collection of fossils from western New York. Sections were made of 150 metriophylloid corallites and serial sections were made of 25 of them.

Busch made a very detailed study of his corals but used variable structures in classifying his specimens. By using such features as corallite diameter, number of septa, nature of septa (amplexoid, dilation), charac-

ter of fossilae, presence or absence of columella, number and nature of tabulae, and allowing for individual variation, the authors suggest that Busch's species can be interpreted as typical specimens or variants of the three common species *Stereolasma rectum* (Hall), *Amplexiphyllum hamiltoniae* (Hall), and *Stewartophyllum intermittens* (Hall).

The authors wish to thank Dr. Mildred Marple for the loan of Busch's types from the Ohio State University Geological Museum.

SYSTEMATIC DESCRIPTIONS

STEREOLASMA RECTUM (Hall)

Pl. 58, figs. 1-16

Strombodes? rectus Hall, 1843, p. 209, text-fig. 5, p. 210; Table of Organic Remains, no. 48, fig. 5.
Cyathophyllum rectum Edwards & Haime, 1851, p. 372.

EXPLANATION OF PLATE 58

All figures $\times 2$

FIGS. 1-16—*Stereolasma rectum* (Hall). 1-7, Busch's hypotypes, OSU 18755 and 18754 a-f; 8-10, syntypes of *Caninia complexa* Busch, OSU 18763 b-e; 11-15, serial transverse sections of hypotype UMMP 36087; Wanakah shale, "demissa" bed, along Smoke Creek, $1\frac{1}{2}$ miles south of Reserve, Erie Co., New York; 16, longitudinal section of hypotype UMMP 36088, upper part of Wanakah shale, along banks of Smoke Creek at Windom, Erie Co., New York.
17-28, 37-39—*Stewartophyllum intermittens* (Hall). 17-19, Busch's hypotypes, OSU 18751 a-c; 20-24, syntypes of *Barrandophyllum reimanni* Busch, OSU 18768 b-f; 25-28, syntypes of *Barrandophyllum simplex* Busch, OSU 18771 b-d, f; 37-39, syntypes of *Hapsiphyllum bifurcatum* Busch, OSU 18776 b-d.
29-32, 40-50—*Amplexiphyllum hamiltoniae* (Hall). 29-32, syntypes of *Caninia tabulata* Busch, OSU 18765b-e; 33-36, Busch's hypotypes of *Amplexiphyllum hamiltoniae* (Hall), OSU 18759d,e,f, and h; 40-43, syntypes of *Alleynia americana* Busch, OSU 18772a,d-f; 44-49, serial sections of hypotype UMMP 36089, upper part of Wanakah shale along Smoke Creek, at Windom, Erie Co., New York; 50, longitudinal section of hypotype UMMP 36090, coral layer of lower Windom shale along small stream at Athol Springs, Erie Co., New York.

Streptelasma recta Hall, 1876, pl. 19, figs. 1-13 *partim*.

Streptelasma ungula Hall, 1876, pl. 19, figs. 14-24 *partim*.

Stereolasma rectum Simpson, 1900, p. 205, text-figs. 16,17; Brown 1909, p. 67-71; Busch, 1941, p. 395, text-figs. 7-16; Stumm, 1959, p. 7, pl. 3, figs. 16-19; Hill, 1956, p. 257.

Caninia complexa Busch, 1941, p. 399, text-figs. 28-33.

Buschphyllum complexa Stumm, 1949, p. 9, pl. 3, figs. 37-39.

Description.—Corallites ceratoid to trochoid, ranging from 0.7 to 5 cm. in length and from 1 to 2.2 cm. in maximum diameter. Average diameter about 1.5 cm. Exterior with vertical interseptal ridges and faint, horizontal growth annulations spaced at various distances apart. Calyxes with thin erect walls and an axially sloping basal portion. Maximum depth of calyx 1.5 cm. Septa ranging from 48 to 60 of which the major extend to axis, where by addition of stereoplasm a stereocolumella is formed in the neanic and early ephebic growth stages. In the later ephebic growth stages columella ceases growth and major septa retreat from axis. Point of retreat typically just below base of calyx. Minor septa appear as short peripheral ridges at position where major septa retreat from axis. Tabulae relatively closely set, complete or incomplete, horizontal axially, distally convex periaxially, deflected proximally as they approach the periphery (see pl. 58, fig. 16). No dissepiments present.

Remarks.—The specimen showing dissepiments illustrated by Busch (1941, p. 400, text-fig. 33) is apparently a small specimen of a species of *Bethanyphyllum*. Busch's type of *Caninia complexa* (pl. 58, fig. 8) displays the stereocolumella characteristic of the neanic and early ephebic growth stages of *Stereolasma rectum*.

Occurrence.—Middle Devonian, Hamilton group, Ludlowville formation, Wanakah shale member; Moscow formation, Windom shale member, western New York.

Types.—The holotype illustrated by Hall (1843, p. 209, text-fig. 5) has not been traced. It may have been reillustrated by Hall (1876, pl. 19) but none of Hall's 1876 drawings exactly match the 1843 drawing. Of Hall's 1876 hypotypes, the originals of figs. 1,2,11,12,13 are in the American Museum of Natural History numbered 4464/1;

of figs. 3,5,7,8 in the same institution numbered 4464/2; of fig. 9 in the New York State Museum numbered 3740/1. The originals of figs. 4,6,10 have not been traced. Some of Hall's 1876 hypotypes may be specimens of *Lopholasma carinatum* Simpson (1900, p. 206, text-figs. 19-20) but a tangential section must be made of each specimen in order to distinguish between the two species. Busch's hypotypes Ohio State University Geological Museum nos. 18754-18755; of *Caninia complexa* Busch no. 18673; hypotypes herein illustrated, University of Michigan Museum of Paleontology nos. 36087, 36088.

AMPLEXIPHYLLUM HAMILTONIAE (Hall)

Pl. 58, figs. 29-32; 40-50

Streptelasma ungula Hall, 1876, pl. 19, figs. 14-24 *partim*.

Amplexus hamiltoniae Hall, 1876, pl. 19, figs. 20-23; Busch, 1941, p. 397-399, figs. 17-27.

Caninia tabulata Busch, 1941, p. 401-403, figs. 34-40.

Alleynia americana Busch, 1941, p. 407-408, figs. 56-63.

Amplexiphyllum hamiltoniae Stumm, 1949, p. 9, pl. 3, figs. 32-36; Hill, 1956, p. 257.

Description.—Typically ceratoid, rarely trochoid or subcylindrical corallites, many irregularly contorted. Maximum diameter observed 2.1 cm., diameter of average corallite about 1.6 cm. Exterior with relatively closely spaced growth annulations. Maximum length about 4 cm., average about 3 cm. Calyxes typically shallow, 3-5 mm. deep with sloping walls. Septa in neanic stage typically thick, rarely thin, becoming thinner toward distal ends, major septa extending to axis, minor septa appearing as peripheral ridges at a corallite diameter of 1.2 to 1.6 cm. Septa in different individuals ranging from 48 to 59. At a corallite diameter of 0.8 to 1 cm. major septa retreat from axis becoming increasingly shorter and thinner distally. Cardinal fossula represented by shortened cardinal septum in late neanic and ephebic stages. Tabulae, complete or incomplete, from 8 to 10 to a centimeter, typically horizontal axially, becoming deflected proximally as they approach the periphery in the majority of specimens. In some, the tabulae remain horizontal to the peripheral wall. No dissepiments present.

Remarks.—A study of serial sections of 12 corallites reveals that the septa vary

greatly in thickness. Serial sections of a specimen (pl. 58, figs. 44-49) show that the septa in the neanic stage are long and thick, but become progressively thinner and shorter in the ephebic stage. Number of septa of different specimens at the same corallite diameter are very similar. At a diameter of 1 cm. the septal count in 6 specimens is 21, 23, 26, 23, 20, and 25.

Occurrence.—Middle Devonian, Hamilton group, Ludlowville formation, upper Wana-kah shale; Moscow formation, lower Win-dom shale, western New York.

Types.—Hall's syntypes (the originals of Hall's 1876, pl. 19, figs. 20-23) American Museum of Natural History no. 4441/1. Busch's hypotypes, Ohio State University Geological Museum no. 18759. Busch's types of *Caninia tabulata* no. 18765; of *Alleynia americana* no. 18772. Hypotypes herein illustrated University of Michigan Museum of Paleontology nos. 36089, 36090.

STEWARTOPHYLLUM INTERMITTENS (Hall)
Pl. 58, figs. 17-28, 37-39

?*Strombodes distortus* Hall, 1843, p. 209, text-fig. 4; Table of Organic Remains, no. 48, fig. 4.

Strombodes? Hall, 1843, Table of Organic Remains, no. 49, figs. 2-2a.

Amplexus intermittens Hall, 1876, pl. 32, figs. 8-15.

Stewartophyllum intermittens Busch, 1941, p. 394-395, figs. 1-6; Stumm, 1949, p. 9, pl. 3, figs. 25-28; Hill, 1956, p. 257.

Barrandeophyllum reimanni Busch, 1941, p. 403-405, figs. 41-49.

Barrandeophyllum simplex Busch, 1941, p. 405, figs. 50-55.

Hapsiphyllum bifurcatum Busch, 1941, p. 409, figs. 64-73.

Description.—Corallum subcylindrical to ceratoid, typically with irregularly spaced flangelike expansions. Calyx relatively flat, peripheral area reflexed in some specimens. Cardinal fossula weakly to moderately well developed (see Hall, 1876, pl. 32, figs. 8-15). In transverse section of neanic stage septa from 16 to 18, thick, extending almost to axis. In early ephebic stage septa from 19 to 22, thick, extending almost to axis in most specimens but only two thirds distance to axis in others. Thick axial ends of septa in lateral contact produce appearance of aulos in a minority of the specimens. In late ephebic stage (just beneath base of calyx) septa extend about two-thirds distance to

axis, typically with free axial ends. At this point the minor septa appear as short peripheral ridges. Cardinal fossula moderately to well developed. In longitudinal section the tabulae are complete and incomplete, relatively flat-topped axially. In the peripheral areas they may be deflected upward, downward, or remain horizontal. No dissepiments.

Remarks.—This form can be distinguished from *A. hamiltoniae* by the flangelike growth expansions on the exterior of the corallum, by the continuously thick and relatively long major septa from neanic to ephebic stage. The tabulae are similar to those of *A. hamiltoniae* except that they may be horizontal or deflected upward in the peripheral regions.

Occurrence.—Middle Devonian, Hamilton group, Ludlowville formation, upper Wana-kah shale; Moscow formation, lower Win-dom shale, western New York.

Types.—Holotype of *Strombodes distortus* not located; syntypes of *Stewartophyllum intermittens* American Museum of Natural History 4442/1 and 4442/2; Busch's hypotypes Ohio State University Geological Museum 18751; of *B. reimanni* Ohio State University Geological Museum 18771, of *H. bifurcatum* Ohio State University Geological Museum 18776.

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