American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK 24, N.Y.

NUMBER 1911 OCTOBER 6, 1958

Some Upper Cretaceous Corals from New Jersey

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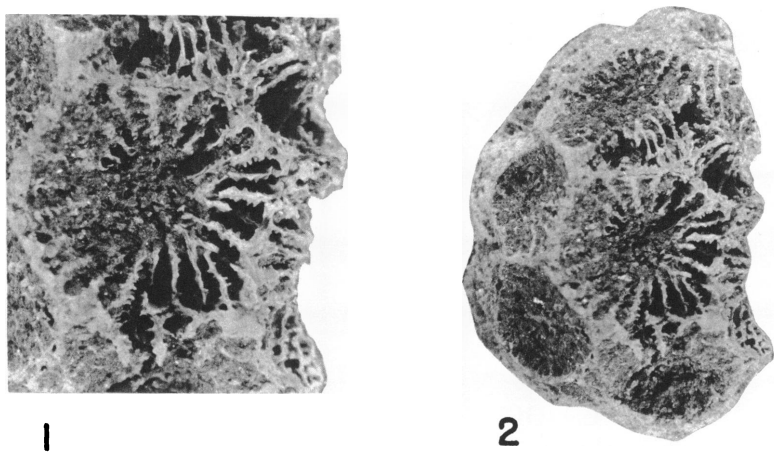
Cretaceous corals from New Jersey have not been extensively collected, nor does it appear that they occur in abundance or diversity. Through the efforts of Dr. Horace G. Richards, Academy of Natural Sciences of Philadelphia, many of the older localities, as well as newer ones, are being visited and collected, with particular attention to the smaller fossils. Three suites of corals recovered during these operations were lent to me by Dr. Richards and are of particular significance because they represent the rediscovery of Cretaceous corals in New Jersey.

Collections from the Woodbury clay at Haddonfield are believed to be in part topotypic with the specimens examined by Bölsche (1870). Specimens of *Trochocyathus balanophylloides* and *Astrangia cretacea* were collected there. Cores from a deep well penetrating the Raritan formation contained, among other marine invertebrates, several small corals referred to the genus *Trochocyathus*. These are the first corals to be recorded from this horizon in New Jersey.

The importance of the Woodbury species can be best assessed by a consideration of the history of the Cretaceous corals of New Jersey. Johnson (1898), reporting on fossils from a well near Mount Laurel, New Jersey, recorded *Platytrochus speciosus* Gabb and Horn, which was re-identified by Vaughan in 1900 as *Trochocyathus woolmani* Vaughan. The horizon was given as the Matawan clay. It is my conclusion that this species is the same as Bölsche's *"Parasmilia" balanophylloides*. Weller (1907) reported the presence of *Micrabacia ameri-*



FIGS. 1, 2. *Astrangia cretacea* (Bölsche), from Haddonfield, New Jersey, A.N.S.P. No. 30482. 1. Calice, × 9. 2. Corallum, × 5.

cana from several localities in the Woodbury clay, but did not mention other Cretaceous corals except for one additional species, *Paracyathus vaughani*, from the Navesink formation. Wells (1933), in his comprehensive monograph of the North American Cretaceous corals, did not see additional or supplementary New Jersey material of any of these species and based nomenclatural changes on the original descriptions and illustrations.

RHIZANGIIDAE

GENUS *ASTRANGIA* MILNE-EDWARDS AND HAIME, 1848

SUBGENUS *COENANGIA* VERRILL, 1869

Astrangia (Coenangia) cretacea (Bölsche), 1870

Figures 1, 2

Astraea cretacea BÖLSCHE, 1870, Zeitschr. Deutschen Geol. Gesell., vol. 22, p. 216.

Siderastrea cretacea (Bölsche) WELLS, 1933, Bull. Amer. Paleont., vol. 18, no. 67, p. 226. Not Söhle, 1897.

Astrangia cretacea (Bölsche) WELLS, MS, Cretaceous corals of New Jersey, *in* Richards, Cretaceous fossils of New Jersey.

DIAGNOSIS: Small, convex coralla composed of three to six calices are usually attached to shells or shell fragments. Calices polygonal, closely adpressed, not deep, with three cycles of septa in two groups. First and second cycles nearly equal in appearance, the third cycle shorter and joining septa of the second cycle. Columella spongy.

REMARKS: There is no doubt that the specimens in hand are the same as Bölsche's, and it is quite possible that they are topotypes. Aside from the original specimen (Bölsche apparently saw only a single specimen), the whereabouts of which is presently unknown, no other specimens have been described from New Jersey. Wells (1933, p. 226) assigned a single specimen from the basal Navarro formation of Milam County, Texas, to the species.

TABLE 1

MEASUREMENTS (IN MILLIMETERS) OF *Astrangia (Coenangia) cretacea* (BÖLSCHE)

Specimen	Diameter of Calices	Number of Septa
1	4.0, 2.7, 3.1	24, —, —
2	3.0, 4.1, 3.6	24, 24, 24
3	4.6	24
4	3.3, 4.0	24, 24
5	3.7	24
6	3.2, 2.9	24, 23

DISTRIBUTION: Plastic clay at Woodbury and Haddonfield (Bölsche). Basal Woodbury clay at Cooper Creek near Grove Street and Park Avenue, Haddonfield, New Jersey (present collection). Lowest Navarro formation, Milam County, Texas (Wells, 1933).

Wells provisionally referred the Plastic clay of Bölsche to the Marshalltown. Richards informs me that this is unlikely for both the Haddonfield and Woodbury localities.

CARYOPHYLLIIDAE

TROCHOCYATHUS MILNE-EDWARDS AND HAIME, 1848

Trochocyathus balanophylloides (Bölsche), 1870

Figures 3, 4

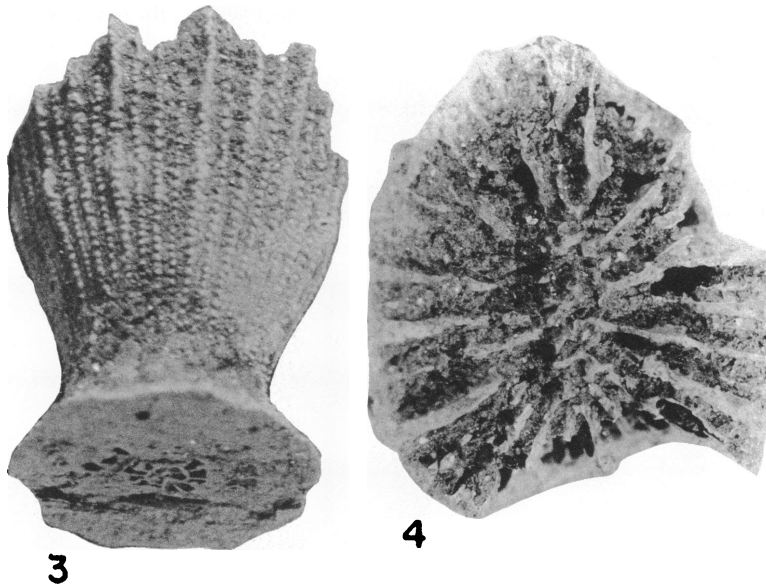
Parasmilia balanophylloides BÖLSCHE, 1870, Zeitschr. Deutschen Geol. Gesell., vol. 22, p. 215.

Platytochus speciosus, JOHNSON, 1898, Proc. Acad. Nat. Sci. Philadelphia, p. 462. Not *Platytrochus speciosus* Gabb and Horn, 1860.

Trochocyathus woolmani VAUGHAN, 1900, Proc. Acad. Nat. Sci. Philadelphia, pp. 436–437, figs. 1–3.

Parasmilia ? balanophylloides, WELLS, 1933, Bull. Amer. Paleont., vol. 18, no. 67, p. 222.

Trochocyathus woolmani, WELLS, 1933, *ibid.*, vol. 18, no. 67, p. 213, pl. 14, figs. 4–7.



FIGS. 3, 4. *Trochocyathus balanophylloides* (Bölsche), from Haddonfield, New Jersey, A.N.S.P. No. 30484. 3. Corallum. 4. Calice. Both × 9.

DIAGNOSIS: Corallum inversely conical to nearly cylindrical, with flaring base where attached. Wall thick, costae numerous, alternating in size, evenly granulate on margins. Septa arranged in six systems,

TABLE 2

MEASUREMENTS (IN MILLIMETERS) OF *Trochocyathus balanophylloides* (BÖLSCHE)

Diameter of Calices	Height of Corallum	Number of Septa
2.5 × 2.4	0.75+	23
3.9 × 3.6	1.5+	39
4.3 × 3.8	—	40+
4.3 × 4.1	1.5+	—
4.4 × 4.3	2.5+	46
4.5 × 3.9	4.0+	—
4.7 × 4.1	2.0+	45
4.7 × 4.2	5.0+	—
5.6 × —	5.5	47
7.2 × 6.5	8.5	—

with three complete cycles, the fourth partially complete. Pali developed before septa of the third cycle, paliform lobes present before first- and second-cycle septa, mingling to form the columella.

REMARKS: The species has been adequately described by both Bölsche (1870) and Vaughan (1900). The synonomy of the two species was suspected by Wells in 1933. The present large suite of well-preserved specimens leaves little doubt as to the correctness of this conclusion. Measurements of the specimens are given in table 2 and indicate that they are somewhat larger than the single specimen possessed by Vaughan (A.N.S.P. No. 685), but of about the same magnitude as those discussed by Wells (1933) from the Cretaceous of Texas and Georgia.

DISTRIBUTION: Plastic clay at Woodbury (Bölsche). Artesian well, Mount Laurel, New Jersey, 150–160 feet below surface (Vaughan). Ripley formation, Columbus, Georgia; Navarro formation, Navarro County, Texas (Wells). Basal Woodbury formation, Cooper Creek, near Grove Street and Park Avenue, Haddonfield, New Jersey (present collection).

Trochocyathus sp.

Figures 5, 6

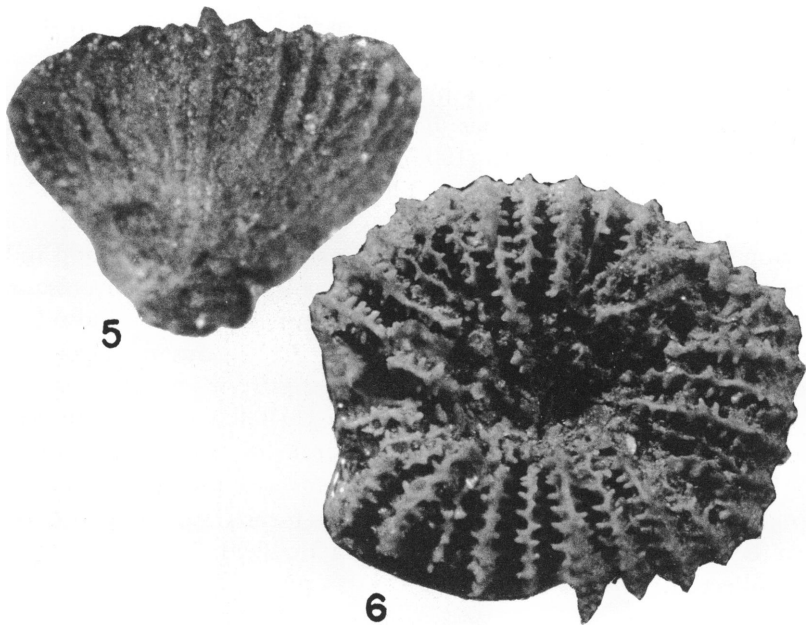
DIAGNOSIS: Base flat but very narrow, sometimes extended into a tubular projection. Corallum above inversely conical or subtrochoid; costate, the costae alternating in size and becoming obscure on the lower half of the corallum. Costae of upper half of corallum sharp and about one-half of the width of the interspaces, ornamented by beads of spinules. Septa about 36 in number, arranged in three groups. Paliform lobes and pali present before most septa of the first, second, and third cycles. Columella papillose, apparently formed by the intermixing of paliform lobes.

TABLE 3

MEASUREMENTS (IN MILLIMETERS) OF *Trochocyathus* SP.

Diameters of Calices	Height of Corallum	Number of Septa
3.56 × —	2.52	36
3.78 × 3.11	2.44	34
4.81 × 4.22	2.52	36

REMARKS: Despite the fact that these corals are the first to be re-



FIGS. 5, 6. *Trochocyathus* sp., from a well at a depth of 1648 feet, Harrisville, New Jersey, A.N.S.P. No. 30486. 5. Corallum, × 18. 6. Calice, × 20.

ported from the Raritan formation of New Jersey, and among the first from the stratigraphic correlatives of this formation, I am reluctant to give them a name, for it is quite possible that they represent young specimens of *Trochocyathus balanophylloides*. The minuteness of the specimens and the fact that they were embedded in a clay matrix which has a disastrous tendency to expand when wetted with sodium bicarbonate made direct observations of the upper portions of the calice difficult. The arrangement of septa is distinctly that of a caryophyllid, and suggestive of a *Trochocyathus* by the presence of a circlet of paliform lobes before the first two cycles of septa. The ornamentation suggests that the relationship is quite close to that of *T. balanophylloides*.

Richards (1956) has mentioned the presence of a marine fauna from deep well cuttings recovered from the Raritan formation. This fauna shows close affinities with that of the Woodbine formation of Texas. No corals have been described from the Woodbine as yet.

DISTRIBUTION: From core 16 (1648 feet) of a deep well near Harrisville, Burlington County, New Jersey.

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