

BRYOZOA OF THE ALLAN HANCOCK
ATLANTIC EXPEDITION, 1939

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(PLATES 1-6)

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During the month of April, 1939, with the *Velero III*, a collecting expedition was made into the Caribbean Sea. The full details of the expedition are given in the account by Dr. John S. Garth, "Geographical Account and Station Records of *Velero III* in Atlantic Waters in 1939," Allan Hancock Atlantic Expedition Report Number 1.

The course of the cruise was from the Panama Canal eastward along the coasts of Panama, Colombia, and Venezuela as far as the islands of Trinidad and Tobago, and returning over much of the same course. The dredging was all done on the coastal shelf, 71 fathoms being the deepest haul. Much of the bottom in this area consists of sand and mud which are usually unfavorable to the development of a rich attached benthic fauna. Since ecological conditions apparently did not vary to any great extent, the list of 107 bryozoan species is unexpectedly large.

Very little such collecting has been done in this region and the records are therefore of special interest for distributional studies. The only paper dealing with the Bryozoa within this area is an account by the writer (Osburn 1927) of 23 species taken at Curaçao Island by Dr. C. J. van der Horst (Bijdragen tot de Kennis der Fauna van Curaçao. Resultaten eener Reis van Dr. C. J. van der Horst in 1920). Dr. van der Horst's collections were all made in shallow water about the harbors of Curaçao.

The first important work on the Bryozoa of the general West Indian area was that of Smitt, the Swedish naturalist, who studied and reported on the collections made by Count L. F. de Pourtales in the region of southern Florida (Smitt 1872 and 1873). In 1908 Osburn collected Bryozoa about the Oceanic Laboratory of the Carnegie Institution at the Tortugas Islands, Florida, (1914), and in 1927 reported on a collection made by van der Horst at Curaçao. In 1928 Canu and Bassler published an important paper on the collections made, especially by the *Albatross*, in the Gulf of Mexico, Florida Straits and vicinity. This was followed by Osburn's report on his collections in the vicinity of Porto

Rico. As a result of these studies about 230 species have been recorded for this general area, but, except for the brief report on Curaçao, the Bryozoa of southern Caribbean coastal shelf are unrecorded.

The present account adds 14 species to those already known to occur in the West Indian area and 7 of these appear to be new and are described and figured. As only 23 species have hitherto been known from the southern coast of the Caribbean Sea, the present work adds 84 to this region and is further important in that a number of these are rare and have been recorded elsewhere only once or twice. Two common Pacific species have been added to the Atlantic fauna. It is well known that many of the tropical species are circumtropical in distribution and may be found almost anywhere in warmer waters. Thus 44 species of the present list are known from the Pacific coast of the Americas, and most of these have also been recorded from the Eastern Atlantic, Western Pacific and Indian Oceans.

The writer desires to express his thanks to the Allan Hancock Foundation of The University of Southern California for financial assistance during the progress of the work; to Dr. Irene McCulloch and her staff of assistants for aid in many ways, and to Mr. Anker Petersen, Staff Artist, for his careful work in preparing the illustrations of new species.

BRYOZOA Ehrenberg 1831

ENTOPROCTA Nitsche 1869

Family *Pedicellinidae* Johnston 1847

Genus *PEDICELLINA* M. Sars 1835

Pedicellina cernua (Pallas), 1771

Osburn 1914: 212; 1940: 326.

Widely distributed; along the eastern coast of the Americas it has been recorded at numerous places from Nova Scotia to Santos Bay, Brazil (Marcus 1938: 5). Osburn has noted its occurrence in the West Indian region at the Tortugas Islands and Porto Rico.

The variations in the number of minute spines on the stalk and calyx has led to the erection of several nominal varieties. In the present collections some individuals have no spines, some have a few on the stalk, but none have spines on the calyx.

Distribution.—Station A30-39,¹ Cubagua Island, shore, a few colonies on *Amathia* stems.

¹ This study involves two station lists: A stations refer to the regular Atlantic station list and At stations refer to the bottom sample station list. In this report the word "*Distribution*" is limited to a summary of the stations involved in this particular investigation.

Genus **BARENTSIA** Hincks 1880

Barentsia discreta (Busk), 1886

Osburn 1914: 185; 1940: 327.

In this species the chitinous stalk appears to have numerous pores, which in reality are only in the internal stalk layer. It is circumtropical in distribution, extending also into temperate waters. Osburn has recorded it from the Tortugas Islands and Porto Rico.

Distribution.—Station A30-39, 2 miles SW of Cape la Vela at 21 to 22 fms, a few colonies.

ECTOPROCTA Nitsche 1869

Cyclostomata Busk 1852

Family **Crisiidae** Johnston 1847

Genus **CRISIA** Lamouroux 1812

Crisia elongata Milne-Edwards, 1838

Osburn 1940: 328.

A circumtropical species, recorded by Osburn off the mouth of Guanica Harbor, Porto Rico.

Distribution.—Station A18-39, 8 miles SW of San Nicolaas Bay, Aruba Island, at 24 fms.

Family **Oncousoeciidae** Canu 1918

Genus **ONCOUSOECIA** Canu 1918

Oncousoecia arcuata Canu and Bassler, 1928

Canu and Bassler 1928: 158.

Ten specimens of this linear encrusting species were found on coral-ines and shells. All of the zoaria are very small, the longest only 4 mm, but the colonies less than 2 mm in length were in reproduction. It has been previously recorded only by Canu and Bassler at the type locality, *Albatross* Station D. 2639, Straits of Florida.

Distribution.—Station At505, Aruba Island at 23 fms.

Genus **PROBOSCINA** Audouin 1826

Proboscina robusta Canu and Bassler, 1928

Canu and Bassler 1928: 157.

The authors of this species had only a single specimen, without an ovicell, from *Albatross* Station D. 2319, north of Cuba. Our specimens

agree closely with the description and measurements, but they also are not ovicelled. The immersed tubules are coarsely striated transversely and thickly punctured; the peristomes are long, curved upward at the base until they are at right angles with the tubes.

Distribution.—Stations At502, At503, and At505. These stations place the locations at Cape la Vela, Colombia and Aruba Island at 13 to 23 fms.

Family **Entalophoridae** Reuss 1869

Genus **ENTALOPHORA** Lamouroux 1821

Entalophora proboscideoides Smitt, 1872

Canu and Bassler 1928: 160.

Smitt described the species from west of the Tortugas Islands, Florida, and Canu and Bassler recorded it from the Pliocene of Bocas Island, Panama.

Distribution.—Stations A14-39, A42-39, At502, At503, At505, At512, At526, and At529. These stations place the locations at Cape la Vela, Colombia; Aruba, Margarita, Cubagua, and Tortuga Islands; and the Gulf of Venezuela at 2 to 41 fms.

Entalophora delicatula (Busk), 1875

Smitt 1872: 11 (*Entalophora deflexa*). Canu and Bassler 1928: 160 (*Mecynoecia deflexa*). Marcus 1937: 24. Osburn 1940: 330.

The zoarium in this species is shorter and the branches of larger diameter than *E. proboscideoides*. As a rule the erect stems are not more than about 5 mm in height and branch dichotomously at the tip.

Smitt listed it from Florida (mistaking it for the European species); Canu and Bassler recorded it from the Gulf of Mexico and the Florida Straits, and Osburn dredged it south of Porto Rico.

Distribution.—Station At528, 12° 13' 15" N, 70° 10' 47" W, and At529, 12° 09' 30" N, 70° 31' 00" W, at 39 fms.

Family **Diaperoeciidae** Canu 1918

Genus **CRISULIPORA** Robertson 1910

Crisulipora orientalis Canu and Bassler, 1928

Canu and Bassler 1928: 162. Osburn 1940: 332.

Described from Egmont Key, Florida. Listed from Guanica Harbor, Porto Rico, by Osburn.

Distribution.—Station A14-39, 2 miles SW of Cape la Vela, Colombia at 22 fms.

Genus **DIAPEROECIA** Canu 1918**Diaperoecia floridana** Osburn, 1940

Osburn 1940:331. Smitt 1872:8 (*Idmonea milneana* Smitt non d'Orbigny). Canu and Bassler 1928:160 (*Diaperoecia radicata*, non Kirkpatrick).

Smitt recorded it from Florida; Canu and Bassler from the Gulf of Mexico and Straits of Florida, and Osburn from Porto Rico and North Carolina.

Distribution.—Stations A14-39, A18-39, At505, and At528. These stations place the locations at Cape la Vela, Colombia; Aruba Island, and the Gulf of Venezuela at 22 to 24 fms.

Family **Idmoneidae** Busk 1859

This family has been recently re-examined by Borg (1944:76) who restricts it as described by Busk. He accepts the genus *Idmidronea* to include the common "*Idmonea*" *atlantica*.

Genus **IDMIDRONEA** Canu and Bassler 1920**Idmidronea atlantica** (Johnston), 1847

This is the widely distributed and well known *Idmonea atlantica* of numerous authors, also listed as *Tubulipora atlantica*. Strangely enough it has not hitherto been recorded from the West Indian region. In the present material there is a specimen with four series of tubules on each side of the midline and an elongate ovicell which extends upon both branches at the bifurcation with the ooeciopore exactly as figured by Osburn (1912:217, plate 19) from Woods Hole, Massachusetts.

Distribution.—Station At526, 7 miles N of Tortuga Island at 41 fms.

Idmidronea atlantica var. **flexuosa** (Pourtales), 1867

Pourtales 1867:111 (*Idmonea flexuosa*). Smitt 1872:6 (*Idmonea atlantica*).

This appears to be a slender variety of *I. atlantica*, as indicated by Harmer (1915:127) and, like the typical form it is widely distributed around the world. The zoarium is slender and there are usually only two rows of tubules on each side. The oecium is short and usually situated below the bifurcation. In our material the variety occurred in the same bottom sample with the typical *atlantica* at Station At526. Pourtales

described this variety from Florida and north of Cuba, but it has not been recorded since from the West Indian region.

Distribution.—Stations A13-39, At505, At526, and At528. These stations place the locations at Cape la Vela, Colombia; Aruba, and Tortuga Islands; and the Gulf of Venezuela at 22 to 41 fms.

Family **Lichenoporidae** Smitt 1866

Genus **LICHENOPORA** Defrance 1823

Lichenopora radiata (Audouin), 1826

Canu and Bassler 1928: 163. Osburn 1940: 334.

Very widely distributed. Canu and Bassler reported it from north of Cuba and Osburn from south of Porto Rico. It is easily recognized by the radiating single series of connate zooecia.

Distribution.—Stations A18-39, At502, and At505. These stations place the locations at San Nicolaas Bay, Aruba Island and Cape la Vela, Colombia at 5 to 24 fms.

Ctenostomata Busk 1853

Family **Alcyonidiidae** Johnston 1849

Genus **ALCYONIDIUM** Lamouroux 1813

Alcyonidium polyoum (Hassall), 1841

There is no previous record of this species from the Caribbean Sea or adjacent waters. It is common all along the North American coast to Florida, Marcus (1937: 125) lists it from Brazil and the writer has a recent specimen from the coast of Texas, Gulf of Mexico.

Distribution.—Station A14-39, 2 miles SW of Cape la Vela, Colombia at 32 fms.

Family **Victorellidae** Hincks 1880

Genus **SUNDANELLA** F. Braem 1939

Sundanella sibogae (Harmer), 1915

Harmer 1915: 45 (*Victorella*). Marcus 1937: 129 (*Victorella*). Osburn 1940: 336 (*Victorella*).

The zoarium is erect and irregularly branched, 50 to 75 mm in height and the zooecia are among the largest known among the Bryozoa (as much as 5 mm long). The zoarium consists of the elongated bases of the zooecia, from which arise at an angle the erect portions of the zooecia.

Harmer described the species from the East Indies, Macassar, Celebes and Tana Djampeah in the Flores Sea. Marcus discovered it in the Bay of Santos, Brazil, and Osburn found it off the mouth of Guanica Harbor, Porto Rico.

Distribution.—Station A14-39, 2 miles SW of Cape la Vela, Colombia at 22 fms, large thriving colonies.

Family **Vesiculariidae** Johnston 1838

Genus **AMATHIA** Lamouroux 1812

Amathia distans Busk, 1886

Busk 1886: 33. Osburn 1940: 339.

Busk described the species from off Bahia, Brazil and it has since been found widely distributed. Osburn listed it from Porto Rico.

Distribution.—Stations A14-39, A18-39, numerous colonies, and At505. These stations place the locations at Cape la Vela, Colombia, and San Nicolaas Bay, Aruba Island at 22 to 24 fms.

Amathia vidovici (Heller), 1867

Verrill 1873: 404 (*Vesicularia dichotoma*). Osburn 1940: 340.

Described by Heller (1867: 128) from the Adriatic Sea and re-described by Verrill from southern New England. It is known from British East Africa (Waters 1914: 848) and is an abundant species all along the eastern coast of North America from Cape Cod, Massachusetts, southward to the Gulf of Mexico and the Caribbean Sea.

Distribution.—Stations A12-39, A14-39, and A18-39, abundant. These stations place the locations at Cape la Vela, Colombia, and San Nicolaas Bay, Aruba Island from surface to 24 fms.

Genus **BOWERBANKIA** Farre 1837

Bowerbankia gracilis Leidy, 1855

Osburn 1914: 218 (*B. gracilis* and the var. *caudata* [Hincks]); 1927: 123 (*B. gracilis* var. *caudata*); 1940: 341.

Distributed all along the eastern coast of North America from Greenland to the Caribbean Sea; also on the coast of Europe. Osburn has listed it from the Tortugas Islands, Florida, Curaçao Island and Porto Rico.

Distribution.—Station A18-39, 8 miles SW of San Nicolaas Bay, Aruba Island at 24 fms, not very common.

Family **Nolellidae** Harmer 1915Genus **NOLELLA** Gosse 1855**Nolella gigantea** (Busk), 1856Osburn 1914: 219 (*Cylindroemium*); 1940: 337.

On the eastern coast of the Americas it is distributed from the Chesapeake Bay (Osburn 1944: 17) to Santos Bay, Brazil (Marcus 1937: 131). Abundant about Porto Rico and in the Gulf of Mexico.

Distribution.—Stations A18-39, 8 miles SW of San Nicolaas Bay, Aruba Island at 23 to 24 fms and A44-39, 4 miles N of Tortuga Island at 21 to 22 fms.

Cheilostomata Busk 1852

ANASCA Levinsen 1909

Division 1, INOVICELLATA Jullien 1888

Family **Aeteidae** Smitt 1867Genus **AETEA** Lamouroux 1812**Aetea anguina** (L.), 1758

Duerden 1896: 270. Osburn 1940: 345.

The "snake coralline," as Ellis called it, is practically cosmopolitan. Duerden noted its presence in the region of Jamaica and Osburn found it inside and outside of Guanica Harbor, Porto Rico.

Distribution.—Station A28-39, Cubagua Island, Venezuela at 2 fms.

Aetea truncata (Landsborough), 1852

Osburn 1914: 186; 1940: 346.

A very widely distributed species, recorded from the West Indies region by Osburn at Tortugas Islands, Florida and Porto Rico.

Distribution.—Station A18-39, 8 miles SW of San Nicolaas Bay, Aruba Island, 23 to 24 fms, one colony on an alga.

Division 2, MALACOSTEGA Levinsen 1909

Family **Membraniporidae** Busk 1854

Genus **MEMBRANIPORA** Blainville 1830

Membranipora tuberculata (Bosc), 1802

Osburn 1914: 193 (*M. tehuelcha*); 1927: 124 (*Nichtina*); 1940: 349.
Canu and Bassler 1928: 18 (*Nitscheina*).

A circumtropical species encrusting algae along shore and on *Sargassum* wherever this "gulf weed" may happen to float. Osburn has noted its presence at the Tortugas Islands, Florida, and Curaçao Island and Porto Rico; Canu and Bassler record it from the Straits of Florida.

Distribution.—Station A22-39. Tortuga Island, Venezuela at 2 to 5 fms, on attached algae.

Genus **ACANTHODESIA** Canu and Bassler 1920

Acanthodesia savarti (Audouin), 1826

Smitt 1873: 20 (*Biflustra*). Osburn 1914: 194 (*Membranipora*); 1940: 352. Canu and Bassler 1928: 14.

Widely distributed in all warmer oceans. Smitt listed it from Florida; Osburn from the Tortugas Islands, Florida, and Porto Rico, and Canu and Bassler from the Gulf of Mexico.

Distribution.—Stations A32-39, A42-39, At505, At517, and At529. These stations place the locations at Coche, Margarita, and Aruba Islands and the Gulf of Venezuela at 18 to 33 fms.

Acanthodesia tenuis (Desor) 1848

Smitt 1873-: 19 (*Biflustra denticula*, non Busk). Canu and Bassler 1928: 62 (*Hemiseptella denticulata*) and p. 63 (*H. hexagonalis*). Osburn 1940: 353.

A very abundant species along the east coast of the United States from Cape Cod southward and south to Brazil (Marcus 1937: 42); Denmark; Mediterranean Sea and the west coast of Africa. It is a variable species, differing with the amount of salinity, depth and the nature of the substratum, and has been described under several names. Marcus (1937: 42) and Osburn (1940: 353) both discuss the variations and synonymy.

Distribution.—Stations A15-39, A32-39, A33-39, A48-39, At505, and At531. These stations place the locations at Bahia Honda and Galera Point Light, Colombia; Coche and Aruba Islands, and the Gulf of Venezuela at 10 to 33 fms.

Genus **CUPULADRIA** Canu and Bassler 1920**Cupuladria canariensis** (Busk), 1859

Smitt 1873: 10 (*Membranipora*). Osburn 1914: 194 (*Cupularia guiniensis*); 1940: 354. Canu and Bassler 1928: 15.

Distributed around the world in warmer waters. Smitt recorded it from Florida; Osburn for the Tortugas Islands, Florida, and Porto Rico, and Canu and Bassler for the Gulf of Mexico and the Straits of Florida. The saucer-shaped, free colonies are easily distinguished from other species of that form by the open membranous front of the zooecia.

Distribution.—Stations A14-39, A27-39, A42-39, A48-39, At503, At505, At511, At517, At526, At527, and At529. These stations place the locations at Cape la Vela and Galera Point Light, Colombia; Margarita, Aruba, Tortuga and Cubagua Islands at 2 to 41 fms.

Family **Electrinidae** d'Orbigny 1851Genus **ELECTRA** Lamouroux 1816**Electra tenella** (Hincks), 1880

Hincks 1880: 376 (*Membranipora tenella*). Marcus 1937: 38.

It is interesting to find this species again in this region. Hincks described it from Florida, but it has not been noted in this area since. Marcus found it in Santos Bay, Brazil and gave an excellent discussion of its characters and relationships. It is a very thin and delicate species and only a small fragment was observed in the present collection.

Distribution.—Station At503, 1 mile SW of Cape la Vela, Colombia at 10 fms.

Family **Hincksinidae** Canu and Bassler 1927Genus **CANUA** Davis 1934

The genus *Canua* Davis was established to replace *Membrendoecium* Canu and Bassler, which was wrongly founded on *Amphiblestrum papillatum* Busk, a species which was later found to have hyperstomial ovicells and dependent avicularia on the gymnocyst. *A. papillatum* was correctly placed by Busk. In the genus *Canua* the ovicells are endozooecial and the avicularia vicarious (interzooecial).

Canua compressa (Osburn), 1927

Osburn 1927: 124 (*Membrendoecium compressum*); 1940: 358.

The encrusting zooecia have the frontal area partially closed in proximally by a granular cryptocyst, leaving an irregularly pyriform

aperture which is narrowed at the distal end. The avicularia are inter-zoecial but often appear as if placed on the proximal gymnocyst; they are small and have a short-triangular or rounded mandible. The ovi-cells are endozoecial.

The species was described from Curaçao and later found off the south shore of Porto Rico.

Distribution.—Stations A1-39, A14-39, A27-39, A30-39, A32-39, A42-39, At502, and At505. These stations place the locations at Caledonia Bay, Panama; Cape la Vela, Colombia; Cubagua, Coche, Margarita and Aruba Islands at shore to 23 fms.

Family **Lunulariidae** Levinsen 1909

Genus **VIBRACELLINA** Canu and Bassler, 1917

The genus is characterized by the presence of comparatively large vicarious vibracula which are prominently auriculate, one side of the chamber being raised and curved over the aperture. Canu and Bassler (1917: 14) placed the genus in the family Hincksinidae, but Harmer (1926: 264) places it in the Lunulariidae, "its vibracula scattered in the zoarium, not alternating with the zoecia in the longitudinal rows; but in other respects it hardly differs from *Setosellina*," which appears to be the correct view.

Vibracellina caribbea, new species

Plate 1, Figs. 1-2

The zoaria form very small colonies encrusting tiny pebbles, shell fragments, etc. Among more than 125 specimens the largest measured only 3 mm. The zoecia are alternated somewhat irregularly by the vibracula. The ancestrula is similar in size and details of structure to the later zoecia and produces 6 to 8 buds, one or two of which are often vibracula.

The zoecia are pale yellowish with the ectocyst, white and glistening when denuded; distinct and separated by a groove of varying width; the mural rim raised, thin and finely granulated except on the distal border where it is more elevated. The roughly granulated descending cryptocyst is continued along the sides to the region of the operculum and occasionally forms a minute proximal shelf. The gymnocyst is small, smooth and shining, often vestigial. The ectocyst covers all of the zoec-

ium. The opesia is variable in form, elliptical or oval to nearly round. The operculum is moderately well chitinized, 0.10 mm in breadth.

The peculiar vibracular chambers are more or less quadrate or rhomboid in form, alternate in position with the zooecia and vary greatly in size, sometimes being nearly as large as the zooecia but usually only about half as large. The opesia is distinctly auriculate, occupies one side of the chamber and is tilted toward that side; the lower edge is nearly straight except for a minute denticle at the middle; the upper edge is more rounded with a distinct lobe at its middle. The side of the chamber opposite the opesia is elevated, rounded and bullate, smooth and shining or slightly roughened in advanced calcification. The mandible has a very short, small triangular base and a very long (as much as 0.80 mm) brownish-yellow filament which is provided on one side with a continuous row of short, fine, distally-projecting setae.

The oocidium is endozooecial, very short, transverse, smooth and slightly raised, appearing as a slightly bulging distal end of the zooecium.

The measurements vary remarkably: zooecial length 0.25 to 0.40 mm, width 0.20 to 0.28 mm; opesial length 0.20 to 0.33 mm, width about 0.19 mm; the vibracularian chamber averages 0.18 mm in length but may be much larger, its opesia averages 0.12 mm in length and 0.06 mm in width.

The zooecial characters conform rather closely to those of *V. laxibasis* Canu and Bassler (1928: 23) from the Pliocene of Bocas Island, Panama, but the measurements are somewhat different and there are other minor characters. It is probably better to keep the recent form separate from that of the Pliocene. The two species *V. viator* and *V. crassatina* described by Canu and Bassler (1929: 97, 98) from the Philippines are larger than *caribbea* and differ in some other respects.

It is a fortunate circumstance that 3 of the more than 200 colonies were living and show the chitinous structures, which hitherto have not been described in this genus. This is the first record of the genus living in Atlantic waters.

Type.—AHF no. 1.

Type locality.—Station At503, 1 mile SW of Cape la Vela, Colombia, 10 fms, very numerous.

Distribution.—Stations A14-39, A42-39, At505, At525, At526, At528, At529, and At530. These stations place the locations at Cape la Vela, Colombia; Margarita, Aruba, and Tortuga Islands, and the Gulf of Venezuela at 19 to 41 fms.

Family **Alderinidae** Canu and BasslerGenus **ALDERINA** Norman 1903**Alderina irregularis** (Smitt), 1873

Smitt 1873: 8 (*Membranipora*). Osburn 1914: 194 (*Membranipora*); 1940: 363. Canu and Bassler 1928: 28.

Recorded by Smitt from Florida, by Osburn from the Tortugas Islands and by Canu and Bassler from the Gulf of Mexico, Straits of Florida and north of Cuba. Hastings (1930: 708) has also listed it from Gorgona, Colombia, on the Pacific side.

Distribution.—Stations A32-39, At505, and At526. These stations place the locations at Coche and Tortuga Islands at 19 to 41 fms, several small colonies.

Genus **CRASSIMARGINATELLA** Canu 1909**Crassimarginatella leucocypha** Marcus, 1937

Marcus 1937: 46. Osburn 1940: 351 (*Conopeum reticulum*, in part).

Apparently there has been much confusion about the identification of *Membranipora reticulum* L. and Marcus has helped to solve a part of it by separating the form with interzoecial avicularia into a new species of *Crassimarginatella*. The writer must confess to finding many difficulties with the species which have "triangular interspaces" at the base of the zooecia. In his Porto Rico paper (1940: 350) Osburn wrote that the triangular spaces "are developed upon the gymnocyst and are therefore merely interopesial. In the same colony there may be other, usually more rounded or ovate, cavities which go right down to the dorsal side of the zooecia and which are certainly interzoecial." As no avicularia could be found on these interzoecial cavities, their nature was not understood. Marcus found small rounded avicularia, and these occasionally occur in our present material. Now the writer thinks there can be no doubt that the specimens from the Gulf of Mexico and West Indies with triangular spaces (or tubercles as they sometimes are called) and interzoecial avicularia belong to Marcus' species.

Distribution.—Stations A13-39, A25-39, A27-39, A30-39, A32-39, A42-39, A87-46, At503, At505, At512, and At528. These stations place the locations at Marco Island, Florida; Cape la Vela, Colombia; Cubagua, Coche, Aruba, and Margarita Islands and the Gulf of Venezuela at shore to 23 fms.

Crassimarginatella tuberosa (Canu and Bassler), 1928

Canu and Bassler 1928:21 (*Aplousina tuberosa*). Osburn 1940:357 (*Aplousina*). Hastings 1945:85.

Dr. Hastings in her excellent review of *Crassimarginatella* places *A. tuberosa* in this genus for reasons which appear to be perfectly sound. The ovicells though very short and incomplete are definitely hyperstomial and the avicularia, which are as large as the zooecia, are similar to those of other species of the genus.

Canu and Bassler record the species from the Gulf of Mexico, the Straits of Florida and north of Cuba.

Distribution.—Station A42-39, 7 miles N of Margarita Island, Venezuela at 17 to 22 fms.

Genus COPIDOZOUM Harmer 1926**Copidozoum tenuirostre** (Hincks), 1880

Hincks 1881:70 (*Membranipora tenuirostris*). Canu and Bassler 1928:31 (*Callopora*). Marcus 1937:48.

The species is found around the world in warmer waters. Canu and Bassler report it from the Gulf of Mexico, east of Yucatan and the Straits of Florida. Marcus lists it from Santos Bay, Brazil.

Distribution.—Stations A32-39, A42-39, and At505. These stations place the locations at Coche, Margarita, and Aruba Islands at 22 to 23 fms.

Genus PYRULELLA Harmer 1926**Pyrulella tubulata** Hastings, 1930

Hastings 1930:709.

This species was described from the Galapagos and recorded also for Gorgona, Colombia. Our single specimen, which encrusted a small branch of a coralline alga, agrees with Miss Hastings' description and figures in every detail, except that the foramen of the oecium is not quite as large and is a little more distal in position. However, I have seen the same variations in specimens from the type locality, Galapagos. The arrangement of the spines, the nature of the zooeciules and the dorsal processes for attachment are in exact agreement. The present record extends the range to the Atlantic.

Distribution.—Station At505, Aruba Island at 23fms.

***Pyrulella caribbea*, new species**

Plate 2, Figs. 1-3

Zoarium encrusting on a nullipore, loosely attached by dorsal prominences.

Zooecia small, 0.25 to 0.30 mm in length; widely separated and joined by lateral tubular processes, usually six in number, with rounded interspaces. Zooeciules often replace functional zooecia, and some of these have minute oval avicularia. The opesia is elliptical and occupies all of the front except for a very small proximal gymnocystal area. The walls are thin and high and provided with spines as follows: one pair of long distal spines projecting forward (these may be as much as 0.25 mm long), two or occasionally three pairs of lateral spines similar to the distal ones but projecting upward, and proximal to these on each side are five or six shorter spines which are curved rather high over the opesia.

The ovicell is slightly longer than broad, with only a suggestion of an oral lip, and in place of the usual rounded frontal foramen there is a longitudinal slit which is sometimes closed to form an imperforate oecium.

The species differs from *P. tubulata* Hastings by its much smaller size, the greater number and the greater length of the spines and by the differences in the ovicell. From *P. sejuncta* (Waters) it differs in the smaller size, the spines and in lacking a triangular area on the ovicell.

Type.—AHF no. 2.

Type locality.—Station A17-39, 3 miles NW of San Nicolaas Bay, Aruba Island, 71 to 96 fms, two colonies.

Genus **CHAPPERIA** Willey 1900***Chapperia cervicornis*** (Busk), 1854

Harmer 1926: 230 (Synonymy and discussion).

A little doubt must be attached to the identification of this species, as the ovicells are wanting. Other characters agree: the presence of four branched distal spines, some of which bear 4 to 6 points; the occasional presence of a small median avicularium, sessile or nearly so, distal to and between the inner spines, and the nature of the cryptocyst, opesia and occlusar laminae.

Its distribution hitherto known is in the waters about Australia, the East Indies, New Zealand and the Indian Ocean and it has not been known in the Atlantic area.

Distribution.—Stations A18-39, and At505, Aruba Island, 23 fms, several small colonies encrusting coralline algae.

Genus **EXECHONELLA** Canu and Bassler 1927**Exechonella antillea spinosa** Osburn, 1940

Osburn 1940: 367.

The tall unjointed spinous processes arise from the frontal pericyst between the pores and similar, but shorter and smaller spines are often present on the peristome. It was recorded by Osburn from Jamaica and Bermuda.

Distribution.—Station A52-39, Caledonia Bay, Panama at 5 fms.

Genus **TREMOGASTERINA** Canu 1911

A heavy pericyst covers the frontal membrane with the exception of one to three large central pores and beneath this the frontal membrane functions in the usual anascan fashion. At first glance the species appear to belong to the Ascophora.

Tremogasterina granulata Canu and Bassler, 1928

Canu and Bassler 1928: 45.

The avicularium is long and narrowly pointed. The lack of oral spines separates it from *T. lanceolata* C. and B., and the absence of a suboral umbo differentiates it from *T. mucronata* (Smitt). Recorded by Canu and Bassler from the Gulf of Mexico and the Florida Straits.

Distribution.—Station At504, 1 mile off Aruba Island at 71 fms.

Tremogasterina mucronata (Smitt), 1873

Smitt 1873: 24 (*Escharipora* ? *mucronata*).

This species is similar to *T. granulata* C. and B., except that there is a small but very definite umbo behind the aperture. It may grade into *granulata*. Apparently it has not been observed since Smitt described it from Pourtales' dredgings west of the Tortugas Islands, Florida.

Distribution.—Stations At525 and At529, the Gulf of Venezuela at 39 fms, several colonies.

Tremogasterina malleolus Canu and Bassler, 1928

Canu and Bassler 1928: 48.

The avicularium is broadened and truncated at the tip and there is a very salient umbonate process which is enlarged at the tip to form a hammer-shaped process.

Recorded by Canu and Bassler from the Gulf of Mexico and from the Caribbean Sea east of Jamaica.

Distribution.—Station At529, 12° 09' 30" N, 70° 31' 00" W at 39 fms, several small colonies.

Division 3, COILOSTEGA Levinsen 1909

Family **Opesiulidae** Julien 1888Genus **VELUMELLA** Canu and Bassler 1917**Velumella americana** Canu and Bassler, 1928

Smitt 1873:6 (*Vincularia abyssicola* in part, pl. 1, fig. 60, not 61).
Osburn 1914: 195 (*Smittipora abyssicola*); 1927: 125; 1940: 371. Canu
and Bassler 1928: 54.

Widely distributed in the West Indian region. Smitt recorded it
from Florida; Osburn from the Tortugas Islands, Florida, from
Curaçao Island and from Porto Rico; Canu and Bassler from the Gulf
of Mexico and north of Cuba.

Distribution.—Stations A14-39, A42-39, A43-39, and At528. These
stations place the locations at Cape la Vela, Colombia; Margarita and
Tortuga Islands and the Gulf of Venezuela at 21 to 22 fms.

Genus **FLORIDINA** Jullien 1881**Floridina antiqua** (Smitt), 1873

Smitt 1873: 12 (*Mollia antiqua*). Canu and Bassler 1928: 60. Osburn
1940: 372.

The species has been known only from the area around the southern
tip of Florida, except for the one record by Hastings (1930: 175) of its
occurrence at Gorgona, Colombia, on the Pacific coast. The present
record extends the range in Atlantic waters from Florida to the northern
coast of South America.

Distribution.—Stations A32-39, At503, At512, At526, and At529.
These stations place the locations at Cape la Vela, Colombia; Coche,
Cubagua, and Tortuga Islands, and the Gulf of Venezuela at 2 to 41 fms.

Genus **MICROPORA** Gray 1848**Micropora coriacea** (Esper), 1791

Smitt 1873: 13. Canu and Bassler 1928: 62. Osburn 1940: 373.

Very widely distributed. In the West Indian region it was recorded
from Florida by Smitt; by Canu and Bassler from the Florida Straits
and the Gulf of Mexico, and by Osburn from the Gulf of Mexico.

Distribution.—Station At503, and At505, Aruba Island at 5 fms.

Family **Calpensiidae** Canu and Bassler 1923Genus **DISCOPELLA** d'Orbigny 1852**Discoporella umbellata** (Defrance), 1823

Smitt 1873: 14 (*Cupularia*). Osburn 1914: 194 (*Cupularia lowei*).
Canu and Bassler 1928: 64 (*Cupularia*).

A species of wide distribution on both coasts of the Atlantic and the west coast of the Americas. Smitt listed it from Florida; Osburn from the Tortugas Islands, Florida, and Canu and Bassler from various localities in the Gulf of Mexico.

Distribution.—Stations A2-39, A13-39, A14-39, A32-39, A48-39, At500, At503, At505, At511, At512, At517, At525, At526, At527, At529, At530, At531, and At533. These stations place the locations at Caledonia Bay, Panama; Cape la Vela and Galera Point Light, Colombia; Aruba, Coche, Cubagua, and Tortuga Islands and the Gulf of Venezuela at 2 to 41 fms. Very abundant.

Family **Steganoporellidae** Hincks 1884Genus **STEGANOPORELLA** Smitt 1873**Steganoporella magnilabris** (Busk), 1854

Smitt 1873: 15 (*Steginoporella elegans*). Osburn 1914: 196; 1940: 375.
Canu and Bassler 1928: 64.

A circumtropical species. Smitt recorded it from Florida; Osburn from the Tortugas Islands, Florida, and Porto Rico; Canu and Bassler from north of Cuba, the Gulf of Mexico and east of Yucatan.

Distribution.—Stations A14-39, A32-39, A42-39, A48-39, At503, At505, At506, At529, At530, At531, and At533. These stations place the locations at Cape la Vela and Galera Point Light, Colombia; Coche, Margarita, and Tortuga Islands and the Gulf of Venezuela at 10 to 41 fms.

Division 4, **PSEUDOSTEGA** LEVINSSEN 1909Family **Cellariidae** Hincks 1880Genus **CELLARIA** Ellis and Solander 1786**Cellaria mandibulata** Hincks, 1882

Hincks 1882: 462; 1884: 203. Robertson 1905: 288.

It was a real surprise to find this species in the Caribbean Sea as it has hitherto been known only on the Pacific coast from British Columbia to southern California. Canu and Bassler (1923: 86) listed it from the Pleistocene of Los Angeles, California.

Three branches were obtained, showing all of the characters. The very large avicularia, with the semicircular brown mandible and the thick-edged, slightly elevated rostrum, agree exactly with specimens from the coast of California.

Distribution.—Station A18-39, 8 miles SW of San Nicolaas Bay, Aruba Island at 23 to 24 fms.

Cellaria irregularis, new name

Smitt 1873: 4 Smitt 1873: 4 (*Cellaria tenuirostris*, non Busk).

Canu and Bassler 1928: 72 (*Cellaria nodosa*, new name).

Canu and Bassler overlooked Norman's description of *Cellularia nodosa*, 1909: 72, from Madeira, and another new name must therefore be substituted.

Smitt's figures of this species are perfectly correct, but he misidentified it with Busk's species. He recorded it from Caryfort Reef, Gulf of Mexico, west of the Tortugas Islands. Canu and Bassler list it from the Gulf of Mexico, *Albatross* station D. 2388. Two fragments appear in our material in perfect condition except for the chitinous parts.

Distribution.—Stations At504, and At528, Gulf of Venezuela at 12 to 71 fms.

Division 5, CELLULARINA Smitt 1867

Family **Scrupocellariidae** Levinsen 1909

Genus **SCRUPOCELLARIA** van Beneden

Scrupocellaria regularis Osburn, 1940

Smitt 1872:14 (*Cellularia cervicornis*, non Busk). Osburn 1914:192 (*S. cervicornis* Smitt non Busk); 1940: 384.

Smitt misinterpreted Busk's *cervicornis*. Harmer (1926: 377) has reexamined Busk's type material and places *cervicornis* Busk under the synonymy of *diadema* Busk. The present species is quite different and Osburn redescribed and renamed it (*loc. cit.*). Smitt's material came from the Pourtales collections off the Florida coast; Osburn lists it from the Tortugas Islands, Florida, and from several stations off the southern Porto Rican coast down to 30 fms.

Distribution.—Stations A13-39, A14-39, A18-39, and At505. These stations place the locations at Cape la Vela, Colombia, and San Nicolaas Bay, Aruba Island at 13 to 24 fms.

Scrupocellaria bertholetti (Audouin), 1926

Marcus 1938: 24. Osburn 1940: 386.

A very widely distributed species in warmer waters. Osburn recorded it from Porto Rico and the Tortugas Islands, and Marcus from Brazil.

Distribution.—Stations A14-39, A18-39, and At504. These stations place the locations at Cape la Vela, Colombia, and Aruba Island at 21 to 71 fms.

Scrupocellaria frondis Kirkpatrick, 1890

Osburn 1940: 387 footnote. Hastings 1943: 361.

This species is remarkable for the large, broad, cervicorn spine with 4 or 5 points, which bends across the upper part of the aperture distal to the scutum. This character, with the rounded scutum, renders it unmistakable in the West Indian fauna. An excellent discussion of the species, with its known distribution, is given by Dr. Anna B. Hastings (*loc. cit.*). It has been taken at Fernando Noronha, Pernambuco, Ascension and the Tortugas Islands, all in the Atlantic.

The present material consists of 7 small colonies, several of them with ovicells. One was attached to the flat surface of an alga, the others to small branching corallines.

Distribution.—Station At505, Aruba Island at 23 fms.

Scrupocellaria harmeri, new species

Plate 3, Figs. 1-2

Zoarium loosely spreading, the branches narrow, the internodes with 3 to 6 zooecia in a series; joint crossing the outer zooecium just proximal to the opesia.

Zooecia slender, elongate (length 0.40 mm, width 0.13 mm, narrowed to about 0.09 at the proximal end), nearly straight, a little incurved on the outer border. Opesia decidedly less than one-half of the frontal length, ovoid, slightly constricted distally, with a broad conspicuous cryptocyst. Scutum ovate, upper lobe small, attached well above the middle of the opesia, without alcorn decoration, wanting on many of the zooecia. Spines 3 outer and 1 or 2 inner, moderately developed.

Frontal avicularia very small, with triangular mandible, wanting on most of the zooecia. Lateral avicularia large and prominent, on all of the zooecia, rostrum and triangular mandible both hooked at the tip.

Vibracular chamber elongate and slender, the groove longitudinal; seta small and weak, scarcely longer than a zooecium. There are two axial vibracula. Radicle chamber directly proximal to the vibracular chamber; radicles smooth, without barbs.

Ooecium elongate, 0.16 mm long by 0.13 mm wide, smooth, imperforate, with the distal end inclined toward the axis of the internode.

The species is named in honor of Sir Sidney Harmer, whose critical work on *Scrupocellaria* and related genera has been of the highest importance.

Type.—AHF no. 3.

Type locality.—Station A18-39, and At505, San Nicolaas Bay, Aruba Island at 23 to 24 fms.

***Scrupocellaria bellula*, new species**

Plate 4, Figs. 1-3

Zoarium small and unbranched, except at the base where a branch arises from the front of the ancestrula and extends in the opposite direction to the primary branch; in one colony a joint occurs in the main branch above the fourth zooecium, and this joint is tubular and appears to be concerned with only one zooecium (similar to the condition in *Scrupocellaria* [*Menipea*] *aculeata* [d'Orbigny]); the internodes are decurved and arcuate, the frontal side uppermost.

Zooecia small, 0.30 to 0.40 mm long by 0.18 mm broad at the widest part and narrowed to 0.12 mm proximally. The short-elliptical opesia occupies half or more of the frontal area, the mural rim thin and elevated. The scutum covers most of the opesia and is remarkably branched, its central area is fan-shaped and this is bordered by 6 to 8 short spines which bifurcate until as many as 30 minute points are produced. The distal spines are 5 to 7 in number, 3 or 4 outer and 2 or 3 inner; the first outer spine is cervicorn with 4 or 5 prongs, resembling that of *S. frondis*, the second and sometimes the third outer are bifurcate; the first inner spine is bifurcate and sometimes has 4 points. The frontal and lateral avicularia are rare, very minute, little elevated, with a short triangular mandible. The vibracular chamber is small and short, triangular in form, the groove transverse, the seta delicate and not longer than a zooecium; the radicle chamber proximal, the radicles about 0.03 mm in diameter and retrorsely barbed. No axillary vibracula.

The ovicell is round, with a slightly upturned lip, perforated with

the pores extended into short tubules, and measures 0.15 mm in breadth.

Four colonies are represented in the collection, the longest being only 3 mm in length, but all in reproduction. All but one have the ancestrula with a branch arising on its front, and only one is jointed beyond the ancestrula. While scuta and spines are notoriously variable in this genus, their nature in this species appears to preclude any possibility of relationship to any of the other forms with a similar type of joint.

Type.—AHF no. 4.

Type locality.—Station At505, Aruba Island at 23 fms, four colonies.

Genus **CANDA** Lamouroux 1816

Canda caraibica Levinsen, 1909

Levinsen 1909: 142. Osburn 1914: 192; 1940: 387.

This species is not known to occur elsewhere than in the Gulf of Mexico and the Caribbean Sea. Levinsen in describing the species merely states "West Indian material." Osburn records it from the Tortugas Islands, Florida, and off Guanica Harbor, Porto Rico. The Hancock collections extend the range to the southern coast of the Caribbean Sea.

Distribution.—Stations A14-39, A18-39, At500, At504, At528, and At529. These stations place the locations at Cape la Vela, Colombia; Aruba Island; Caledonia Bay, Panama and the Gulf of Venezuela at 11 to 71 fms.

Family **Bicellariellidae** Levinsen 1909

Genus **BUGULA** Oken 1815

Bugula neritina (Linnaeus), 1758

Osburn 1914: 186; 1927: 126; 1940: 389. Hastings 1930: 704.

Generally distributed around the world in warmer waters. Its dark reddish purple color often makes it a conspicuous object on the piles of docks. As it is a shallow water species it is not often taken in dredging below a few fathoms. Osburn recorded it from the Tortugas Islands, Florida, from Curaçao Island and at various localities in Porto Rico. Hastings lists it from Colon, Panama.

Distribution.—Stations A24-39, A28-39, and A42-39. These stations place the locations at Cubagua and Margarita Islands at shore to 22 fms.

Bugula flabellata (J. V. Thompson), 1847

Smitt 1872: 18. Osburn 1914: 17; 1940: 391.

Widely distributed in temperate seas; on the Atlantic coast from Maine to Brazil. Smitt listed it from Florida; Osburn found it at the Tortugas Islands, Florida, and Porto Rico.

Distribution.—Station A32-39, 3 miles N of Coche Island, 19 to 33 fms.

Bugula turrita (Desor), 1848

Osburn 1912: 225. Marcus 1937: 68.

An abundant species along the North Atlantic coast from Massachusetts to North Carolina and Marcus found it at numerous places in Santos Bay, Brazil. Strangely enough, it did not appear in Osburn's studies of Porto Rican Bryozoa (1940), nor did Canu and Bassler report it from the Gulf of Mexico (1928). More recently the writer has received a specimen from southern Florida. Its appearance in the southern Caribbean is not remarkable, but evidently this species does not thrive in tropical waters as it does in more temperate areas.

Distribution.—Station A30-39, Cubagua Island, shore, several young colonies attached to a shell.

Bugula johnstonae (Gray), 1843

Smitt 1872: 17 (*Halophila johnstoniae*). Canu and Bassler 1928: 42 (*Halophila*).

Widely distributed in Australian and East Indian waters. Smitt recorded it from Florida and Canu and Bassler list it from one station in the Gulf of Mexico (*Albatross* station 2405). Osburn did not find it at Porto Rico. It is a coarse and striking species of such a nature that it could not be readily overlooked. The present material is abundant and there are occasional ovicells. It has usually been reported without ovicells and Levinsen (1909: 97) definitely indicates that the genus *Halophila* is without ooecia. Harmer (1926: 448) found them in specimens from Celebes and Canu and Bassler found them in their Florida material.

Distribution.—Stations A18-39 and At505, San Nicolaas Bay, Aruba Island, 22 to 24 fms.

Genus **CAULIBUGULA** Verrill 1900

Similar to *Bugula* in most respects, except that the zoarium has a jointed stalk consisting of a series of elongate modified zooecia (kenozooecia) devoid of a polypide. The branches are biserial and the oecia often incomplete.

Caulibugula levinseni Osburn, 1940

Osburn 1940: 394.

A small fragment apparently belongs to this species, judging by the measurements and form of the zooecia, the absence of terminal spines except the occasional elongate one on the inner angle, and the mode of branching. Ovicells and avicularia are wanting from this fragment of the tip of the branch.

Distribution.—Station At504, 1 mile off Aruba Island at 71 fms.

Genus **BEANIA** Johnston 1840**Beania mirabilis** Johnston, 1840

Osburn 1914: 189; 1940: 398.

Distributed around the world in warm and temperate waters. Because of the loose growth habit and the small size of the colonies they are readily overlooked, especially as they are usually found among hydroids, algae, and other erect Bryozoa. Osburn records it from the Tortugas Islands, Florida, and off the mouth of Guanica Harbor, Porto Rico.

Distribution.—A14-39, 2 miles SW of Cape la Vela, Colombia at 21 to 22 fms.

Beania hirtissima (Heller), 1867

Osburn 1940: 397.

This species usually forms a bristly mat loosely attached to the substratum, occasionally growing free. The spines are remarkable for their number and length; about 10 or 12 fine ones on each side of the opesia and the same number of longer stouter ones around the distal end of the zooecium. Unlike our other species, the zoarium is multiserial and the connecting tubules are short. Osburn reported it from Porto Rico and the Bermuda Islands, and Marcus obtained it at Santos Bay, Brazil (1937: 62). Otherwise it is known from the Mediterranean Sea and the Cape Verde and Madeira Islands.

Distribution.—Station At505, Aruba Island at 23 fms, one colony.

Beania intermedia (Hincks), 1881

Osburn 1914: 189 and 1940: 398. Marcus 1937: 61.

This is a uniserial species, without spines, distributed widely in warmer waters. Osburn recorded it from the Tortugas Islands, Florida, and from several localities about Porto Rico. Marcus lists it from Santos Bay, Brazil.

Distribution.—Station A30-39, Cubagua Island, shore.

Family **Farcinariidae** Busk 1852

Genus **NELLIA** Busk 1852

Nellia oculata Busk, 1852

Smitt 1873: 3. Levinsen 1909: 120 (*Nellia tenella*). Osburn 1914: 191; 1927: 125; 1940: 400. Canu and Bassler 1928: 26.

Harmer (1926: 242) calls attention to a peculiarity of distribution in this species in two areas, (1) the Indian Ocean, Australia and the East Indies, (2) the western Atlantic from Florida to Brazil. It is a very common and well distributed species in the Gulf of Mexico and the West Indies.

Smitt recorded it from Florida; Levinsen from Texas and the island of St. Thomas; Osburn from the Tortugas Islands, Florida, Curaçao, and Porto Rico, and Canu and Bassler from the Gulf of Mexico and the Pleistocene of Bocas Island, Panama.

Distribution.—Stations A14-39, A42-39, At500, At503, At527, At529, and At530. These stations show the locations at Cape la Vela, Colombia; Caledonia Bay, Panama; Tortuga Island and Gulf of Venezuela at 10 to 39 fms.

Family **Epistomiidae** Gregory 1903

Genus **SYNNOTUM** Pieper 1881

Synnotum aegyptiacum (Audouin), 1826

Osburn 1914:191 (*S. aviculare*); 1927: 126; 1940: 402.

A very widely distributed warm water species. On the Atlantic coast the writer has specimens from Beaufort, North Carolina and from the Bermuda Islands. Marcus (1937: 58) records it for Santos Bay, Brazil.

Distribution.—Station A14-39, 2 miles SW of Cape la Vela, Colombia at 21 to 22 fms.

Division 6, CRIBRIMORPHA Harmer 1926
 Family **Cribrilinidae** Hincks 1880
 Genus **CRIBRILINA** Gray 1848
Cribrilina floridana (Smitt), 1873

Smitt 1873: 23 (*C. figularis* var. *floridana*). Osburn 1914: 195 (*Cribrilina*); 1940: 406 (*Puellina*). Canu and Bassler 1928: 74 (*Puellina*).

This species is not well enough known to be certain of its generic relationships. Smitt allied it to *C. figularis* (Johnston), which is now the genotype of the genus *Figularia*, but it certainly is not congeneric with *F. figularis*. In 1940 the writer followed Canu and Bassler in placing it under *Puellina* Jullien, but again *floridana* can hardly be congeneric with *P. gattyae*, the genotype of that genus. No ovicells nor avicularia have been observed, there are small pore chambers (figured by Canu and Bassler), the intercostal lacunae are rather large, rounded and extended to the border of the front, and there is a short, strong spine at each side of the aperture. Until more can be known about the structure of the species it is being returned to *Cribrilina*, where it was originally described.

The species is not known outside of the Gulf of Mexico and the Caribbean Sea, Tortugas Islands, west of Florida and south of Porto Rico, 5 to 42 fms.

Distribution.—Stations A32-39 and At505, Aruba Island at 23 fms, one colony considerably abraded.

Genus **COLLETOSIA** Jullien 1886

Harmer (1926: 474) has reestablished Jullien's genus and includes in it the following species. The writer must agree with Harmer that the *Eschara radiata* of Moll "does not seem to be congeneric" with the *Lepralia gattyae* of Busk which is the genotype of *Puellina*.

Colletosia radiata (Moll), 1803

Smitt 1873: 22 (*Cribrilina* and *C. innominata*). Canu and Bassler 1928: 73 (*Puellina radiata* and *P. innominata*). Osburn 1940: 405 (*Puellina innominata*) and p. 406 (*P. radiata*).

There seems to be but little question as to the relation of *C. innominata* (Couch) to *radiata* (Moll). Older workers differentiated them

on the basis of the presence of small sub-oral pores, but there is so much variation that this character is not diagnostic. In Waters' excellent discussion (1923:556), while keeping *innominata* separate, he states that "a sharp dividing line could not be found." Canu and Bassler (1928:73) record them separately but state that "it is really impossible to distinguish them specifically." Harmer (1926:475) merges *innominata* with *radiata* and Marcus (1937:73) does the same. Osburn listed them separately, though questioning the distinctness.

Apparently there is great variation in all of the essential characters, so much so that it would be possible to set up numerous varieties on the greater development of some particular character. The colonies in the present collection are much like Smitt's figures of *innomiata* (plate 5, figs. 109, 110).

Distribution.—Stations A18-39, At505, and At526. These stations place the locations at San Nicolaas Bay, Aruba Island and Tortuga Island at 21 to 24 fms.

Genus **MEMBRANIPORELLA** Smitt 1873

Membraniporella petasus Canu and Bassler, 1928

Canu and Bassler 1928:36.

This species resembles *M. aragoi* (Audouin) in the arrangement of the frontal costules, though the costae appear to branch more frequently than in that species. Younger specimens show usually four tips to each costule; these meet at the midline and fuse leaving large lacunae. In older specimens the costules become broader and the central portion of the front becomes nearly closed. There is a strong suboral bar formed by the fusion of the first pair of costules, a pair of short lateral spines and a similar pair of terminal ones which, in fertile zooecia, unite across the front of the ovicell.

Distribution.—Stations A32-39, At505, and At512. These stations place the locations at Coche, Aruba, and Cubagua Islands at 2 to 23 fms.

ASCOPHORA

Species with a calcified frontal and a compensation sac which permits the inflow and outflow of water when the tentacles are protruded or withdrawn.

Family **Hippothoidae** Levinsen 1909
 Genus **HIPPOTHOA** Lamouroux 1821
Hippothoa flagellum Manzoni, 1871

Osburn 1914: 198 (*H. distans*); 1940: 408 (*H. distans*).

This is a very widely distributed species. Recorded by Osburn from the Tortugas Islands, Florida, and off Guanica Harbor, Porto Rico. It is very small, forming a delicate tracery on the surface of shells and is readily overlooked.

Distribution.—Station A14-39, 2 miles SW of Cape la Vela, Colombia at 21 to 22 fms.

TRYPOSTEGA Levinsen 1909
Trypostega venusta (Norman), 1864

Smitt 1873:61 (*Lepralia inornata*, non Gabb and Horn); and p. 37 (*Gemellipora glabra* forma *striatula*). Osburn 1914: 198; 1940: 409. Canu and Bassler 1928: 77. Marcus 1938: 35.

Widely distributed around the world. Smitt listed it for Florida; Osburn for the Tortugas Islands, Florida, and Porto Rico; Canu and Bassler for the Gulf of Mexico, Florida Straits and north of Cuba, and Marcus has found it as far south as Santos Bay, Brazil.

Distribution.—Stations A18-39, At502, At503, and At505. These stations place the locations at Aruba Island and Cape la Vela, Colombia at 10 to 24 fms.

Family **Schizoporellidae** Bassler 1935
 Subfamily **Schizoporellinae** Bassler 1935
 Genus **SCHIZOPORELLA** Hincks 1877
Schizoporella unicornis (Johnston), 1847

Smitt 1873: 44 (*Hippothoa isabelleana*). Osburn 1914: 205; 1927: 126 (*Schizopodrella*); 1940: 419. Canu and Bassler 1928: 97 (*Schizopodrella isabelleana*).

A widely distributed species, usually abundant along the eastern coast of the Americas from Nova Scotia to Brazil, with numerous variations. Smitt listed it for Florida; Osburn for the Tortugas Islands, Florida, Curaçao and Porto Rico; Canu and Bassler for the Gulf of Mexico and the Island of St. Thomas.

Distribution.—Station A42-39, Margarita Island at 18 fms and At 502, 1 mile SW of Cape la Vela, Colombia at 13 fms.

Schizoporella floridana Osburn, 1914

Osburn 1914: 205; 1927: 126 (*Schizopodrella*); 1940: 422. Canu and Bassler 1923: 106 (*Schizopodrella floridana*); 1928: 93 (*Schizopodrella*).

This species has been recorded by Osburn from the Tortugas Islands, Florida, Curaçao and Porto Rico; by Canu and Bassler from east of Yucatan, Gulf of Mexico, and from the Miocene of North Carolina and Florida.

Distribution.—Stations A14-39, 2 miles SW of Cape la Vela, Colombia at 21 to 22 fms, and At526, Tortuga Island at 41 fms.

Schizoporella (Stephanosella) biaperta (Michelin), 1845

Smitt 1873: 46 (*Hippothoa*). Robertson 1908: 287. Osburn 1912: 237. Canu and Bassler 1923 (*Stephanosella*).

This is practically a cosmopolitan species, abundant from Florida northward, and it is difficult to understand why it has not been reported south of Florida. In all of the work done in this general region by Osburn and Canu and Bassler this species has not been noted and the only reference is that of Smitt for "Florida seas." Marcus has not reported it for Brazil. On the west coast it is an abundant species from British Columbia to the Galapagos Islands. Canu and Bassler list it from numerous localities in the American Miocene and Pleistocene. It is such a characteristic form that it could hardly fail to be identified, so the conclusion seems inescapable that *S. biaperta* is rare or wanting from Florida southward.

Small colonies were taken at the stations mentioned below, but these showed none of the luxuriance of growth that is common to the species.

Distribution.—Stations A14-39, 2 miles SW of Cape la Vela, Colombia at 21 to 22 fms and A32-39, 3 miles N of Coche Island, Venezuela at 19 to 33 fms.

Genus STYLOPOMA Levinsen 1909**Stylopoma informata** (Lonsdale), 1845

Smitt 1873: 42 (*Hippothoa spongites*). Levinsen 1909: 324 (*S. spongites*). Osburn 1914: 207 (*Schizoporella spongites*); 1927: 128 (*S. spongites*); 1940: 424. Canu and Bassler 1928: 91 (*S. spongites*) and p. 95 (*Schizopodrella falcifera*).

A very well known species of world wide distribution, which until recently has been generally attributed to the *Eschara spongites* of Pallas, 1766. Smitt, Florida; Levensen, St. Thomas and St. John of the Virgin Islands; Osburn, Tortugas Islands, Curaçao and Porto Rico; Canu and Bassler, Gulf of Mexico, north of Cuba and east of Yucatan. It is a warm water species and is common from Florida to Brazil.

Distribution.—Stations A14-39, A32-39, A42-39, A52-39, At502, At504, and At529. These stations place the locations at Caledonia Bay, Panama; Cape la Vela, Colombia; Aruba Island and the Gulf of Venezuela at 5 to 71 fms.

Genus **BUFFONELLARIA** Canu and Bassler 1927
Buffonellaria reticulata Canu and Bassler, 1928

Canu and Bassler 1928: 89.

The authors of this species were quite correct in calling it "bizarre." The high, irregular reticulations of the frontal olocyst and the thin-walled, flaring, infundibuliform peristome give it an appearance quite unlike any other species. The writer cannot add anything to the original description, except to state that the avicularian mandible is short-pointed and directed forward, or occasionally more or less laterally. It has hitherto been known only from the type locality, west of Florida in the Gulf of Mexico.

Distribution.—Stations At502, At505, At512, and At528. These stations place the locations at Cape la Vela, Colombia; Aruba and Cubagua Islands and the Gulf of Venezuela at 2 to 23 fms.

Genus **GEMELLIPORINA** Bassler 1936
Gemelliporina glabra (Smitt), 1873

Smitt 1873: 37 (*Gemellipora glabra*). Busk 1884: 176 (*Gemellipora*).
 Canu and Bassler 1928: 98 (*Gemellipora*). Marcus 1939: 140.

This peculiar branched species was represented in the collection by a few small fragments. Smitt described it from "West off Tortugas," Florida; Canu and Bassler recorded it for the Gulf of Mexico, the Straits of Florida, and south of Miami, Florida; Busk found it in the Challenger collections off Bahia, Brazil, and Marcus recovered it as far south as Recife, Brazil.

Distribution.—Stations A18-39, At503, At504, and At528. These stations place the locations at Cape la Vela, Colombia; Aruba Island and the Gulf of Venezuela at 10 to 71 fms.

Genus **LACERNA** Jullien 1888**Lacerna horsti** (Osburn), 1927

Osburn 1927: 127 (*Schizopodrella*); 1940: 426. Marcus 1937: 87 (*Schizopodrella*); 1938: 39; 1939: 139.

Known from the type locality at Curaçao Island and from off Guanica Harbor, Porto Rico. Marcus records it from Santos Bay, Brazil.

Distribution.—Stations A14-39, A42-39, At512 and At529. These stations place the locations at Cape la Vela, Colombia; Margarita Island and the Gulf of Venezuela at 17 to 23 fms.

Genus **CYCLOPERIELLA** Canu and Bassler 1920**Cycloperiella rosacea**, new species

Plate 5, Figs. 1-3

Zoarium erect, branching irregularly, tubular (possibly encrusting an alga or sponge), or encrusting on shells; a second layer of zooecia sometimes superposed. The color is a beautiful roseate pink.

The zooecia are rather large (0.55 to 0.78 mm long by 0.40 to 0.52 mm wide), a little inflated and separated by deep grooves when young, but becoming nearly flat with complete calcification. The frontal is a thick, heavy tremocyst, with numerous large pores. The peristome is low, thin when young, but becoming very broad with age. The primary aperture is slightly longer than broad (about 0.18 by 0.16 mm), the proximal border slightly less curved than the distal; with a pair of short, strong condyles. The operculum is well chitinized, brownish in color, with a heavy dark brown sclerite encircling on the proximal border, enlarged at the condyles and extending forward nearly straight on each side at some distance within the lateral border, then fading out somewhat to meet within the distal border.

Avicularia are rather rare, but occasionally there is a small one with an acute triangular mandible, directed forward or toward the peristome, at the side of the aperture. Spines wanting.

The ovicell is large and not immersed, thick walled. In the fertile zooecium the peristome rises prominently on the sides, leaving a proximal sinus, and uniting with the proximal edges of the ooecium to encircle the aperture (Fig. 2).

This genus is known only from the genotype, *C. rubra* Canu and Bassler (1923: 137) from the Miocene and Pliocene of the Southeastern States and Jamaica. The present species is remarkably like *C. rubra* in

the photographs (plate 21, figs. 5-9) presented by Canu and Bassler, but their figures show no avicularia, they describe it as encrusting "covering large surfaces," the measurements are slightly smaller and the primary aperture as broad as it is long. In *rubra* the ovicell is described as entirely covering the aperture. As the only ovicell found on *rosacea* is broken on the top, it is impossible to determine the extent of the oocial cover, but the aperture is completely encircled except for a deep sinus in the peristome of the proximal border.

It is interesting to find a recent representative of this genus which has been known only as a fossil.

Type.—AHF no. 5.

Type locality.—A14-39, 2 miles SW of Cape la Vela, Colombia, 21 to 22 fms, three detached branched colonies, largest 12 mm in length by 4 mm in diameter.

Distribution.—Stations A42-39, At503, and At528. These stations place the locations at Cape la Vela, Colombia; Margarita Island and Gulf of Venezuela at 10 to 22 fms.

Subfamily **Hippoporinae** Bassler 1935

Genus **HIPPOPORINA** Neviani 1895

Hippoporina porcellana (Busk), 1860

Smitt 1873:62 (*Lepralia cleidostoma*). Osburn 1914:209 (*Lepralia*); 1940:428. Canu and Bassler 1928:104 (*H. cleidostoma*); 1930:18 (*H. cleidostoma*). Marcus 1937:96. Hastings 1930:721.

There has been considerable discussion concerning the identity of *cleidostoma* Smitt with *porcellana* Busk. Canu and Bassler maintain that they are not at all the same, but Hastings and Marcus have given good reasons for placing *cleidostoma* in synonymy. Miss Hastings has examined Busk's type specimen and points out the variability within a single colony. The specimens in the Hancock collection are too incomplete to afford additional data. The species is known from Madeira (type locality), Florida, Porto Rico, north of Cuba, Gulf of Mexico and east of Yucatan. Marcus records it from Santos Bay, Brazil, and it is a common form on the Pacific coast from British Columbia to the Galapagos Islands.

Distribution.—Stations A14-39 Cape la Vela, Colombia at 22 fms and A42-39 Margarita Island at 18 fms.

Hippoporina contracta (Waters), 1899

Osburn 1914: 211 (*Lepralia contracta* var. *serrata*); 1940: 428. Canu and Bassler 1920: 576 (*Perigastrella*). Marcus 1937: 98 (*Perigastrella*).

This species is now known to be widely distributed in temperate and warmer waters around the world. On the Atlantic coast of the Americas it ranges from Cape Cod, Massachusetts, southward to Santos Bay, Brazil and on the Pacific coast from southern California to the Galapagos Islands. There has been considerable discussion as to its generic relationships. Canu and Bassler placed it in *Perigastrella*, Hastings left it in that genus but placed it next to *Hippoporina* and Marcus suggested a relation to *Hippomenella*. Osburn (1940: 428) placed it in *Hippoporina* because of an array of similar characters. The species was listed by Osburn from the Tortugas Islands, Florida, and from Porto Rico.

Distribution.—Stations A14-39, A42-39, At500, and At526. These stations place the locations at Caledonia Bay, Panama; Cape la Vela, Colombia; Margarita and Tortuga Islands at 11 to 41 fms.

Genus **HIPPOMENELLA** Canu and Bassler 1917

Hippomenella mucronata (Smitt), 1873

Smitt 1873: 45 (*Hippochoa mucronata*).

This brilliantly red species was described from Florida at 29 fathoms, by Smitt, and has not been noted since. Canu and Bassler (1928: 108) doubtfully described *H. rubra* from the Gulf of Mexico at 30 fathoms, the chief difference being the presence of avicularia in the latter species. Our material consists of small fragments of a few zooecia, without avicularia. It is necessary to wait for further specimens before deciding whether *rubra* is to be submerged.

Distribution.—Stations At505, Aruba Island at 23 fms and At528, the Gulf of Venezuela.

Hippomenella fissurata (Canu and Bassler), 1928

Canu and Bassler 1928: 110 (*Lepralia fissurata*). Osburn 1940: 431.

Described first as a fossil from the Pliocene of Panama. Osburn recovered living specimens from Porto Rico and added to the description. Our present material agrees well in most respects with the Porto Rican specimens, except that the aperture is somewhat longer, measuring about as in the fossil specimens. The lateral oral avicularia are quite constant and about opposite the cardelles. The frontal is definitely an olocyst with a coarsely granular pleurocyst covering it rather late in calcification.

Canu and Bassler state that the frontal is "perforated by large tremopores." This may be an error due to the conditions of fossilization, but if it is true the recent specimens must belong to a different species in spite of the agreement in all other characters.

Distribution.—Station At528, the Gulf of Venezuela, several colonies encrusting shells.

Genus **AIMULOSIA** Jullien 1888

Aimulosia floridana, new species

Plate 6, Fig. 3

Zoarium unilaminar, encrusting, especially on shells where small rounded colonies are formed. The largest colony observed is about 1 cm in diameter.

The zooecia are quite variable in size, length 0.25 to 0.40 mm, width 0.20 to 0.30 mm, sometimes nearly as wide as long; rather regular in form and arrangement, more or less quadrate; distinct with well-defined interzooecial grooves in the younger stages. The frontal is a thick pleurocyst, smooth and shining but becoming rougher with age; a single row of areolar pores, separated by short costae; the front is elevated toward the aperture. The peristome is considerably elevated proximally and the secondary aperture slants distally; the wall thick; a strong umbonate process rises above the proximal border of the aperture and often bears a minute pointed avicularium on the side near its tip. The primary aperture is subcircular, less rounded on its proximal border, slightly longer than broad (0.10 mm long by 0.09 mm wide); four oral spines are present in very young stages but soon disappear.

An avicularium with an acute triangular mandible directed distally is usually situated opposite the operculum; not infrequently there is one on each side and often they are both wanting. Rarely a similar avicularium may be present on the front, usually near the proximal end.

The oecium is very prominent, short and wide (width 0.20 mm), cucullate, thick walled, smooth and shining with sometimes a small rounded boss at the top; very wide open and with the median border curved slightly forward and downward. This type of oecium appears to be usual in the genus, though Jullien's figure of the genotype (Jullien 1888: 59, plate 1, fig. 5) shows a longer ovicell without the arched border.

Canu and Bassler have described several species of this genus from the American Miocene and Pliocene, but as far as I am aware the only recent species recorded is the genotype, *A. australis* from Cape Horn. For some thirty years I have had a small specimen from Porto Rico which is

too imperfect to afford a satisfactory description. The above description is taken from a specimen (holotype) collected by Dr. J. S. Garth at Station A87-46 at Marco Island, Florida.

Type.—AHF no. 6.

Type locality.—Station A87-46, Marco Island, Collier County, Florida, shoal.

Distribution.—Station A30-39, A33-39, At503, and At512. These stations place the locations at Cubagua and Coche Islands and Cape la Vela, Colombia, at 2 to 10 fms.

Aimulosia uvulifera (Osburn), 1914

Osburn 1914: 210 (*Lepralia*); 1940: 427 (*Lepralia*).

This species appears to belong in the genus *Aimulosia*. The nature of the frontal aperture and ovicell all seem to conform sufficiently. It was originally described from a single small specimen from the Tortugas Islands, Florida, and later scanty material was obtained from Porto Rico. The several fragments in the Hancock material add nothing to my former accounts, except that I am able to discover an occasional minute avicularium hidden beneath the side of the projecting umbo.

The species differs from *A. floridana* in the much heavier umbo which becomes tridentate at the tip, in the broader ovicell with a more distinct labellum, and in the distribution of the avicularia which are scattered over the frontal and are not regularly placed at the side of the aperture.

Distribution.—Stations A12-39, A18-39, A43-39, At503, At504, At505, and At511. These stations place the locations at Cape la Vela, Colombia; San Nicolaas Bay, Aruba Island, Cubagua and Tortuga Islands at shore to 71 fms.

Subfamily *Microporellinae* Bassler 1935

Genus *MICROPORELLA* Hincks 1877

Microporella ciliata (Pallas), 1766

Smitt 1873: 26 (*Porellina ciliata*). Osburn 1914: 208; 1927: 129; 1940: 432. Canu and Bassler 1928: 110.

Cosmopolitan. Smitt listed it for Florida; Osburn for the Tortugas Islands, Florida, Curaçao Island, and Porto Rico; Canu and Bassler for the Gulf of Mexico and the Straits of Florida.

Distribution.—Stations A32-39, 3 miles N of Coche Island at 19 to 33 fms, and At512, Cubagua Island at 2 fms.

Microporella ciliata personata (Busk)

Osburn 1940: 433 (under *M. ciliata*).

A widely distributed variety of *ciliata* in which the peristome rises high proximal to the aperture, between it and the ascopore. The writer has observed it at the Tortugas Islands, Curaçao and Porto Rico.

Distribution.—Stations A14-39, 2 miles SW of Cape la Vela, Colombia at 22 fms, and At502, 1 mile off Aruba Island at 71 fms.

Family **Smittinidae** Levinsen 1909

Genus **SMITTINA** Norman 1903

Smittina trispinosa (Johnston), 1838

Smitt 1873: 59 (*Escharella jacotini*), and p. 60 (*E. spathulata*). Osburn 1914: 208; 1927: 129 (*S. t.* var. *spatulosa*, by error); 1940: 434 (*S. trispinosa* and vars. *spathulata* Smitt, *munita* Hincks, *protecta* Thornely, and *nitida* Verrill). Canu and Bassler 1928: 114 (*S. spathulata*).

This species is found around the world and from the Arctic regions to tropical seas and shows an almost infinite amount of variation. Many varieties have been named, and doubtless a number of specific names will be found to have only varietal value. In the region of the Gulf of Mexico and the Caribbean Sea it has been recorded (with several of its variations) from Florida, Porto Rico, east of Yucatan and at Curaçao Island. In the present collection is a colony which is like the var. *spathulata* in most respects, but has a few slightly elevated triangular avicularia among the more usual spatulate ones.

Distribution.—Stations A30-39, At502, At503, At526, At528, and At529. These stations place the locations at Cubagua and Tortuga Islands and the Gulf of Venezuela at shore to 41 fms.

Smittina trispinosa munita Hincks, 1884

Osburn 1940: 436.

This is a rather well-marked variety in which the peristome is high and folded into a secondary sinus at the top. The avicularium is characteristically placed on the front touching the peristome and with its long pointed mandible directed toward the proximal end of the zooecium. Recorded by Osburn from Porto Rico and by Marcus (1937: 108) from Brazil.

Distribution.—Stations A10-39, outside Caledonia Bay, Panama at 28 fms, and A30-39, Cubagua Island at shore.

Smittina smittiella, new species

Plate 6, Figs. 1-2

Smitt 1873:60 (*Escharella landsborovii* var. *minuscula*).

For nearly forty years I have puzzled over what Smitt had in the Pourtales collections which he referred to his northern variety *minuscula*, which is now recognized to be a distinct species.

In the present collection there are several colonies which fit the short description given by Smitt and the width of the aperture also agrees with his measurement. The ovicell is quite different from that of *minuscula* in being broader and perforated at all stages of calcification. The minute median suboral avicularium is different in that the mandible is very short-spatulate (broader near the tip) and the salient rostrum is denticulate or serrate, with 6 to 8 denticles across its projecting upper border. The lyrula is broad, with lateral projections at the tip. Zooecial length 0.45 mm (0.40 to 0.55 mm); the aperture is 0.10 to 0.12 mm wide, and the oecium averages 0.24 mm in complete calcification.

Neither of Smitt's figures (plate 10, figs. 201, 202) refer to the present species, but to what he designated as "typical *Escharella Landsborovii*." Whether or not he was correct in this determination cannot be decided yet, as no *landsborovii* have been recovered in all of the more recent dredging in the West Indian region.

Type.—AHF no. 7.

Type locality.—Station A18-39. Also Station At505, 8 miles SW of San Nicolaas Bay, Aruba Island at 21 to 23 fms, and "Pelican" Sta. 136-5, south of Pensacola, Florida.

Family **Tubucellariidae** Busk 1884

The zoarium is erect and jointed, with radicles for attachment. The tubular zooecia are arranged to form rounded internodes; the peristome is much produced and proximal to it is a small ascopore. The ovicell is merely an enlargement of the peristomial tube.

Genus **TUBUCELLARIA** d'Orbigny
Tubucellaria cereoides (Solander), 1786

Osburn 1914: 203 and 1940: 440. Canu and Bassler 1928: 113.

The rounded stems with chitinous joints are sparsely branched. The zooecia are tubular and immersed, but the peristomes are more or less erect, elongate and usually fluted; the frontal is a tremocyst and a small

ascopore is situated a short distance proximal to the peristome. There are no avicularia and the ovicell is merely an expansion of the peristome.

This is a very widely distributed species, but apparently is not abundant on the American side of the Atlantic. Osburn found it at the Tortugas Islands, Florida, and off Guanica Harbor, Porto Rico, and Canu and Bassler recorded it from Fowey Light, southern Florida.

Distribution.—Stations At529, 12° 09' 30" N, 70° 31' 00" W at 39 fms, and At530, 12° 11' 45" N, 70° 45' 15" W at 30 fms.

Family **Adeonidae** Jullien 1903
Genus **ADEONA** Lamouroux 1816
Adeona violacea (Johnston), 1847

Smitt 1873: 30 (*Porina violacea* and *P. plagiopora*). Osburn 1914: 199; 1940: 445. Canu and Bassler 1928: 126 (*A. plagiopora*).

In 1914 Osburn called attention to the intergradation of *plagiopora* with *violacea*. Since that time Hastings (1930: 728) has placed them in synonymy and Marcus (1939: 147) has given an extended synonymy locating *plagiopora* under *violacea*.

The species has a very wide distribution. Smitt and Osburn have listed it for the Tortugas Islands, Florida, and Osburn for Porto Rico. Canu and Bassler recorded it for the Gulf of Mexico, the Florida Straits and north of Cuba.

Distribution.—Stations A30-39, A42-39, At505, and At513. These stations place the locations at Cubagua, Aruba, and Margarita Islands, at shore to 23 fms.

Genus **BRACEBRIDGIA** MacGillivray 1886
Bracebridgia subsulcata (Smitt), 1873

Smitt 1873: 28 (*Porina*). Osburn 1914: 199; 1940: 446. Canu and Bassler 1928: 127.

This species appears to be known only from the West Indian region. Smitt recorded it from the Florida Straits, Osburn from the Tortugas Islands and Porto Rico, and Canu and Bassler from Miami, Florida, and the Gulf of Mexico.

Distribution.—Stations A14-39 and At503, 1 mile SW of Cape la Vela, Colombia at 10 to 22 fms, and At529, 12° 09' 30" N, 70° 31' 00" W at 39 fms.

Family **Reteporidae** Smitt 1867Genus **SERTELLA** Jullien 1903**Sertella marsupiata** (Smitt), 1873

Smitt 1873:67 (*Retepora*). Osburn 1914:200 (*Retepora*); 1940:441 (*Reteporellina*). Canu and Bassler 1928:122 (*Retepora*).

Harmer, in his splendid review of the Reteporidae of the Siboga Expedition (1934:571) places this species under *Sertella* (see discussion of *S. suluensis*).

Smitt recorded it from Florida, 16 to 26 fathoms; Osburn from the Tortugas Islands and south of Porto Rico; Canu and Bassler from the Gulf of Mexico southwest of Florida and the Caribbean Sea at 683 fathoms.

Distribution.—Stations A14-39, At503, At526, At527 and At529. These stations place the locations at Cape la Vela, Colombia; Tortuga Island and the Gulf of Venezuela at 10 to 41 fms.

Genus **RETEPORA** Lamarck 1801**Retepora prominens** (Canu and Bassler), 1928Canu and Bassler 1928:124 (*Reteporella prominens*).

The authors of this species were uncertain as to the generic relationships of this species, due to the inability to determine certain essential characters. In the present collection the few small fragments add nothing to our knowledge, though they agree with the description. In his revision of the Reteporellidae, Harmer (1934) regards the old genus *Retepora* as a catch-all for the inclusion of species of uncertain relationships and I am following him in removing the above species from *Reteporella* until more is known about it.

Distribution.—Station A42-39, 4 miles N of Margarita Island at 21-22 fms.

Genus **RHYNCHOZOOON** Hincks 1877**Rhynchozoon tuberculatum** Osburn, 1914

Osburn 1914:200; 1927:130; 1940:442.

The colonies are all small and inconspicuous, usually encrusting on the flat surfaces of shells. The species is probably well distributed throughout the West Indian region as Osburn has recorded it from the Tortugas Islands, Florida, Curaçao Island, and Porto Rico, from shallow water to a depth of 18 fathoms.

Canu and Bassler (1923:157) have described *R. levigatum* from the

Pleistocene of the Canal Zone, which differs only in the larger size of the zooecia and the smoother frontal area.

Distribution.—Station A52-39, Caledonia Bay, Panama and At529, 12° 09' 30" N, 70° 31' 00" W at 5 to 39 fms.

Family **Cheiloporinidae** Bassler 1936

Genus **HIPPALIOSINA** Canu 1918

Hippaliosina rostrigera (Smitt), 1873

Smitt 1873: 57 (*Escharella rostrigera*). Osburn 1914: 211 (*Lepralia*); 1940: 448. Canu and Bassler 1928: 130.

Apparently well distributed throughout the Gulf of Mexico and the Caribbean Sea, but not known elsewhere. Smitt described it from Florida; Osburn listed it from the Tortugas Islands, Porto Rico and west of Florida, and Canu and Bassler from north of Cuba, the Gulf of Mexico and the Middle Miocene of Virginia.

Distribution.—Stations A14-39, A42-39, and At526. These stations place the locations at Cape la Vela, Colombia; Margarita Island and Tortuga Island at 21 to 41 fms.

Genus **TREMOSCHIZODINA** Duvergier 1921

Tremoschizodina lata (Smitt), 1873

Smitt 1873: 36 (*Gemellipora lata*). Canu and Bassler 1928: 131.

Smitt described the species from Florida at 68 fathoms. Canu and Bassler recorded it from northwest of Havana, Cuba, 387 fathoms; south of Miami, Florida, 40 fathoms; Straits of Florida, 56 fathoms, and Gulf of Mexico west of Florida, 30 fathoms. The bathymetrical range is considerable. The geographical distribution is extended somewhat by the present record.

Distribution.—Stations A18-39, At503, At504, At505, and At526. These stations place the locations at Cape la Vela, Colombia; Aruba and Tortuga Islands at 10 to 41 fms.

Genus **WATERSIPORA** Neviani 1895

Watersipora cucullata (Busk)

Osburn 1914: 211 (*Lepralia*); 1940: 449.

This conspicuous purplish-black species is found around the world in warmer waters. It is a shallow water species and seldom occurs below

a few fathoms. Osburn found it common at the Tortugas Islands, Florida, and again at Guanica Harbor, Porto Rico.

Distribution.—Stations A25-39 and A30-39, Cubagua Island, shore, common on shells.

Genus **TETRAPLARIA** Tenison-Woods 1878

Osburn 1914: 202 (*Arborella*).

The zoarium is erect, articulated, with corneous joints, dichotomous. Zooecia in four rows, in alternating pairs, back to back. The internodes are short, 2 to 5 zooecia in a series. The frontal is a tremocyst with small pores. The ovicell is endozooecial but somewhat prominent. No spines nor avicularia.

Tetraplaria dichotoma (Osburn), 1914

Osburn 1914: 202 (*Arborella dichotoma*), and 1940: 448.

Described from Tortugas Islands, Florida at 10 fathoms. Also recorded by Osburn from Porto Rico, from the Bahama Islands and from Beaufort, North Carolina. The present record extends the range to the southern shore of the Caribbean Sea.

Distribution.—Station At529, 12° 09' 30" N, 70° 31' 00" W at 39 fms.

Family **Phylactellidae** Canu and Bassler 1917

Genus **LAGENIPORA** Hincks 1877

Lagenipora verrucosa Canu and Bassler, 1928

Canu and Bassler 1928: 137. Osburn 1940: 450.

Hitherto known only from the records of Canu and Bassler, Florida Straits, 56 fathoms and north of Cuba, 33 to 143 fathoms, and from Osburn's record off southern Porto Rico at 6 fathoms.

The species of *Lagenipora* have considerable resemblance to those of *Costazia* and *Lekythopora* but are distinguished by the presence of a tremocystal front with numerous large pores. The zooecia are not erected, as in *Costazia*, but are recumbent with a more or less erect peristome which usually bears an avicularium on each side at the top.

Distribution.—Stations A18-39, A29-39, and At502. These stations place the locations at Cape la Vela, Colombia; Aruba and Cubagua Islands at 2 to 23 fms.

Family **Crepidacanthidae** Levinsen
Genus **MASTIGOPHORA** Hincks 1880

The frontal is a tremocyst, the peristome complete and elevated, the aperture with a sinus, the ovicell small and recumbent, and there is a setiform or palmate avicularium at each side of the peristome.

Mastigophora pesanseris (Smitt), 1873

Smitt 1873: 43 (*Hippothoa pesanseris*). Osburn 1914: 207 (*Escharina*); 1927: 130; 1940: 452. Canu and Bassler 1928: 133.

This small species is readily distinguished by the presence of a palmate or "goose-foot" avicularium at each side of the aperture, which bears a deep rounded sinus and is completely surrounded by the salient peristome. It is widely distributed and appears to be common throughout the West Indian region. Smitt described it from the Tortugas Islands, Florida; Osburn recorded it from the Tortugas, Curaçao and Porto Rico and Canu and Bassler listed it from the Straits of Florida and north of Cuba.

Distribution.—Station At529, 12° 09' 30" N, 70° 31' 00" at 39 fms.

Family **Celleporidae** Busk 1852
Genus **HIPPOPORIDRA** Canu and Bassler 1927
Hippoporidra calcarea (Smitt), 1873

Smitt 1873: 63 (*Lepralia edax* forma *calcarea*). Osburn 1914: 212 (*Lepralia*). Canu and Bassler 1928: 140.

This species is usually easily distinguished from its congener, *H. edax* (Busk), by the absence of an umbo and by the presence of minute inter-zooecial avicularia. Smitt described it from Florida at 49 to 79 fathoms; Osburn found it at the Tortugas Islands at 12 fathoms, and Canu and Bassler recorded it from the Gulf of Mexico and the Straits of Florida. They encrust gastropod shells.

Distribution.—Stations A42-39, At503, At504, At505, and At512. These stations place the locations at Cape la Vela, Colombia; Margarita, Cubagua, and Aruba Islands at 2 to 23 fms.

Genus **HIPPOTREMA** Canu and Bassler 1927**Hippotrema janthina** (Smitt), 1873

Smitt 1873: 63 (*Lepralia edax* forma *janthina*). Osburn 1914: 213 (*Lepralia janthina*). Canu and Bassler 1928: 141.

There is a close general resemblance between this species and the species of *Hippoporidra*, but the frontal is a tremocyst with numerous pores and its color in life is a deep blue black, vestiges of which pigmentation usually remain even in dead colonies.

Smitt described it from Florida at 13 fathoms; Osburn listed it for the Tortugas Islands at 6 fathoms, and Canu and Bassler at 130 fathoms north of Cuba.

Distribution.—Stations A13-39, A24-39, A27-39, A30-39, A42-39, At503, At504, At505, At511, At512, and At513. These stations place the locations at Cape la Vela, Colombia; Cubagua, Margarita, and Aruba Islands at shore to 71 fms.

Genus **SCHIZMOPORA** MacGillivray 1888**Schizmopora dichotoma** (Hincks), 1864

Smitt 1873: 53 (*Cellepora avicularis*). Osburn 1914: 214 (*Cellepora*). Canu and Bassler 1928: 149.

A well-known species in the middle North Atlantic. Listed by Smitt from Florida at 9 to 111 fathoms, and by Osburn from the Tortugas Islands at 10 fathoms. Canu and Bassler record it from the Gulf of Mexico west of Florida and from the Pliocene of Bocas Island, Panama.

Distribution.—Station A42-39, 7 miles N of Margarita Island at 22 fms and At528, the Gulf of Venezuela.

Genus **HOLOPORELLA** Waters 1909**Holoporella albirostris** (Smitt), 1873

Smitt 1873: 70 (*Discopora albirostris*). Osburn 1914: 215. Canu and Bassler 1928: 142.

This is usually easily distinguished by the dark pigmentation, through which the tall pointed white suboral prominences stand out distinctly. Smitt described it from Florida at 25 to 35 fathoms; Osburn recorded it from the Tortugas Islands from low water down to 15 fathoms, and Canu and Bassler listed it from the Gulf of Mexico and the Straits of Florida down to 56 fathoms. The species has apparently had a long existence as it has been noted as a fossil as far back as the Oligocene.

Distribution.—Stations A32-39, At502, At526 and At529. These stations place the locations at Cape la Vela, Colombia; Coche and Tortuga Islands and the Gulf of Venezuela at 10 to 41 fms.

Holoporella magnifica Osburn, 1914

Osburn 1914: 216 and 1940: 455. Canu and Bassler 1928: 144.

A large, coarse species, which encrusts shells, sponges, etc. Osburn described it from the Tortugas Islands at 19 fathoms and listed it also from Biscayne Key, Florida, Porto Rico, the Bermuda Islands and Beaufort, North Carolina; Canu and Bassler recorded it for the Gulf of Mexico and east of Yucatan.

Distribution.—Station At505, Aruba Island at 23 fms, one small colony.

Holoporella vagans (Busk), 1855

Canu and Bassler 1928: 148. Osburn 1940: 456.

This appears to be the only species in the West Indian region which bears a notch (not a sinus) in the proximal border of the aperture. Canu and Bassler recorded it from the Straits of Florida and off Miami, Florida, down to 56 fathoms. Osburn listed it for Porto Rico and the Bermuda Islands. It may not be the *vagans* of Busk as it differs in several minor characters, but I have followed Canu and Bassler until the opportunity arrives to compare with Busk's type material.

Distribution.—Stations A14-39, A42-39 and At526. These stations place the locations at Cape la Vela, Colombia; Margarita and Tortuga Islands at 21 to 41 fms.

Holoporella subalba Canu and Bassler, 1928

Canu and Bassler 1928: 146. Osburn 1940: 456.

The species was described from east of Yucatan, down to 25 fathoms. Osburn has recorded it from Porto Rico and off Havana, Cuba. It forms rather large encrustations, ivory or dead white in color, with large, long-spatulate avicularia.

Distribution.—Station A42-39, 7 miles N of Margarita Island at 22 fms.

Genus **TREMATOOECIA** Osburn
Trematooecia protecta Osburn, 1940

Osburn 1940: 459.

This genus was established to include the *Lepralia turrita* of Smitt (1873:65), as the genotype, and the present species both of which have a large pore or depression on the top of the oecium, together with other characters which separate it from *Holoporella*. In the present collection there are six small, young colonies which are without ovicells, but which agree in measurements and in the presence of 4 to 6 tall spinous processes around the aperture, as well as in the glistening white texture.

Distribution.—Stations A42-39, At503, At504, At505, and At512. These stations place the locations at Cape la Vela, Colombia; Aruba, Margarita, and Cubagua Islands at 2 to 22 fms.

Trematooecia pertusa (Smitt), 1873

Smitt 1873:72 (*Discopora pertusa*). Waters 1885:305 (?*Cellepora pertusa*), and 1909:165 (?*Holoporella pertusa*).

This unusual species has apparently not been observed since it was described by Smitt from Pourtales' dredgings off the coast of Florida (exact locality not stated by Smitt). Both of Waters' references appear to be in doubt: the first is fossil in the Aldinga formation of Australia and is entirely without avicularia; the second, from the Sudanese Red Sea, has a shorter operculum of different form and bears spatulate avicularia.

Smitt's figures, especially plate 12, figs. 240, 241, are excellent for the young stage and his description, as far as it goes, is correct.

The zoaria form rounded caps or nodules on the projecting points of corallines and similar surfaces and, as far as observed, the colonies are always small. The zooecia are perfectly erect, a millimeter or more in height, and there is no orientation even at the growing edge of the colony. The frontal or exposed ends of the zooecia are irregularly hexagonal, slightly ventricose, and separated by thin raised lines. The frontal is a tremocyst with large pores, often only a few in addition to the areolar pores. The primary aperture is rounded distally, somewhat straighter on the sides back to the heavy cardelles, the proximal border a broad arc as wide as the rest of the aperture, and the operculum presents almost the exact picture illustrated for *T. protecta* Osburn (1940; plate 8, fig. 71). The peristome is moderately thin, raised, and usually bears 4 small

tubercles on its summit in complete calcification. A rather large, round oral avicularium is situated immediately above the primary orifice, but this is often wanting. Small rounded avicularia, measuring only 0.05 to 0.07 mm, occur in various positions on the frontal.

The ovicells, as in the other species of the genus (*T. turrita* Smitt and *T. protecta* Osburn), are complete (not widely open as in *Holoporella*), very large (0.45 to 0.50 mm in breadth) and covered by a tremocyst similar to that of the frontal. There is no evidence of the large central pore which is present in the other species, but the specimen is heavily calcified and it may have become covered as happens in later stages of *turrita* and *protecta*. The ooecial aperture opens into the peristome and is not closed by the operculum.

In the writer's collection there are several specimens from Porto Rico, which for lack of the ovicells were not reported in his Porto Rico paper (1940).

Distribution.—Station At533, 5 miles NW of Galera Point Light, Colombia at 12 fms, one colony of 24 zoecia in reproduction, attached to a coralline.

Family **Mamilloporidae** Canu and Bassler 1927

Genus **MAMILLOPORA** Smitt, 1873

Mamillopora cupula Smitt, 1873

Smitt 1873: 33. Canu and Bassler 1928: 153.

There are three cup or saucer-shaped genera in the West Indian region, *Cupuladria*, *Discoporella* and *Mamillopora*, all belonging to different families. What they have in common is chiefly the habit of the larva in attaching itself to a sand grain or other small particle and developing an unattached colony which may have some small capacity for movement by means of the avicularia or vibracularia.

Smitt described and listed this species from Florida at 30 to 68 fathoms; Canu and Bassler recorded it from the Gulf of Mexico and the Straits of Florida. Osburn (1940) did not find it at Porto Rico, but Hastings (1930: 733) noted its presence at Gorgona, Colombia, in the Pacific Ocean.

Distribution.—Stations A42-39, At503, At504, At525, At526, At527, At528, and At529. These stations place the locations at Cape la Vela, Colombia; Aruba, Margarita and Tortuga Islands, and the Gulf of Venezuela at 10 to 71 fms.

LITERATURE CITED

Since the general bibliography referring to the Bryozoa of the Gulf of Mexico and the islands of the West Indies is readily available in the reports by Canu and Bassler (1928) and Osburn (1940), only those publications which report species from this area are listed here, with the exception of a few that are included for special reasons.

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1873. The same. Part 2. 11 (4) : 1-83.

PLATES
AND
EXPLANATIONS

PLATE 1

- Fig. 1. *Vibracellina caribbea*, new species, showing arrangement and details of zooecia and vibracula.
- Fig. 2. The same, showing the ancestrula at the center, with 5 daughter zooecia and 2 vibracula budded from it.

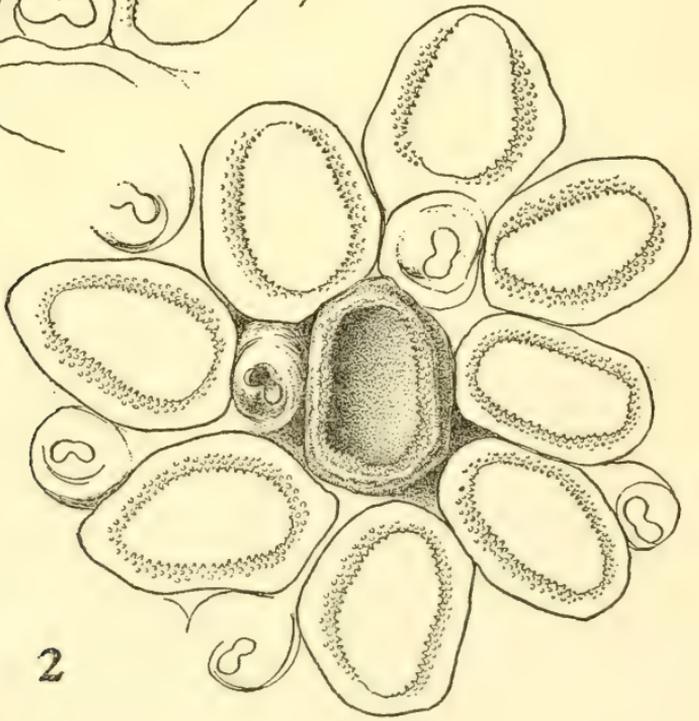
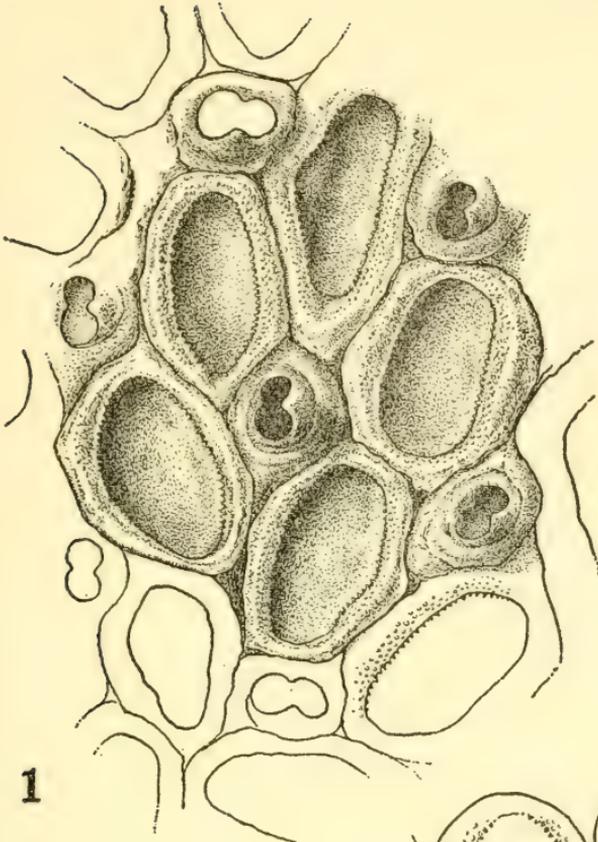


PLATE 2

Fig. 1. *Pyrulella caribbea*, new species, showing the spines and the separation of the zooecia.

Fig. 2. The same, details of the ovicell.

Fig. 3. The same, lateral view of spines and ovicell.

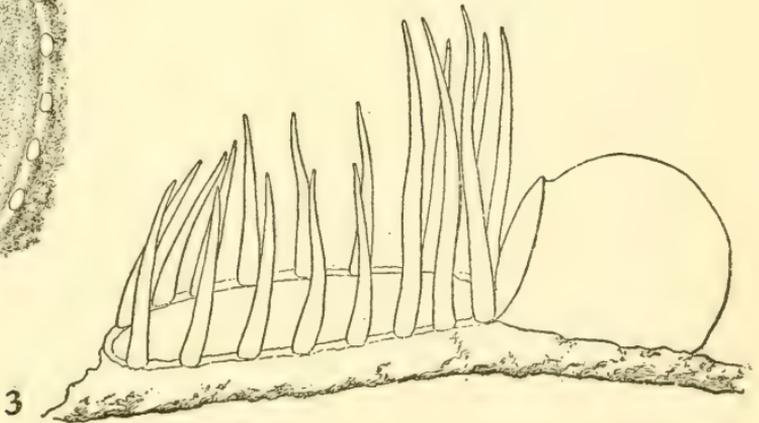
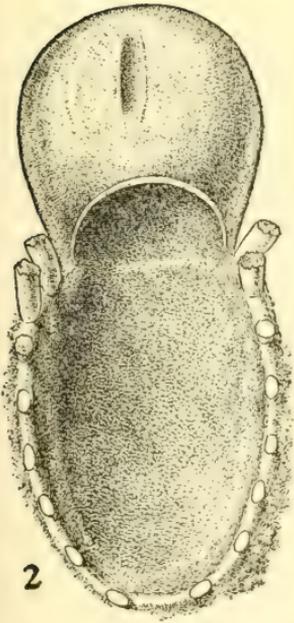
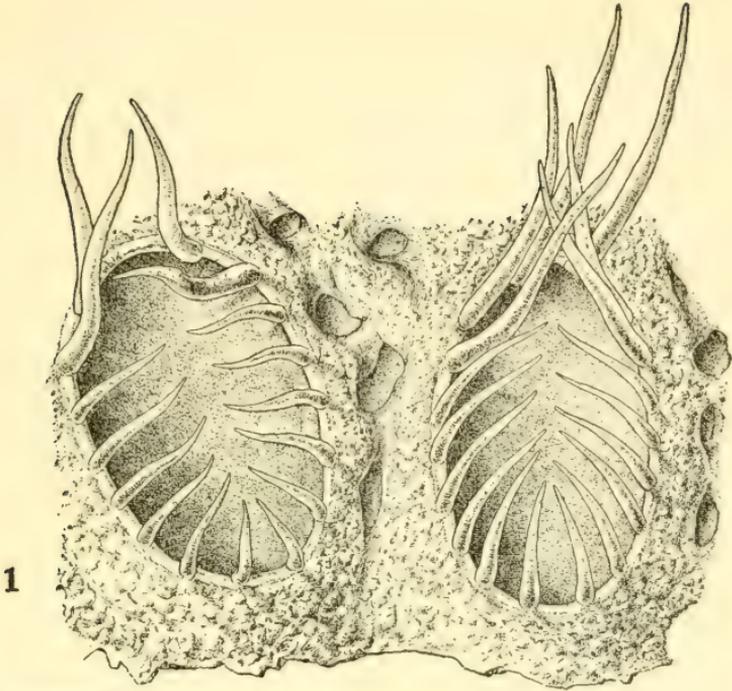
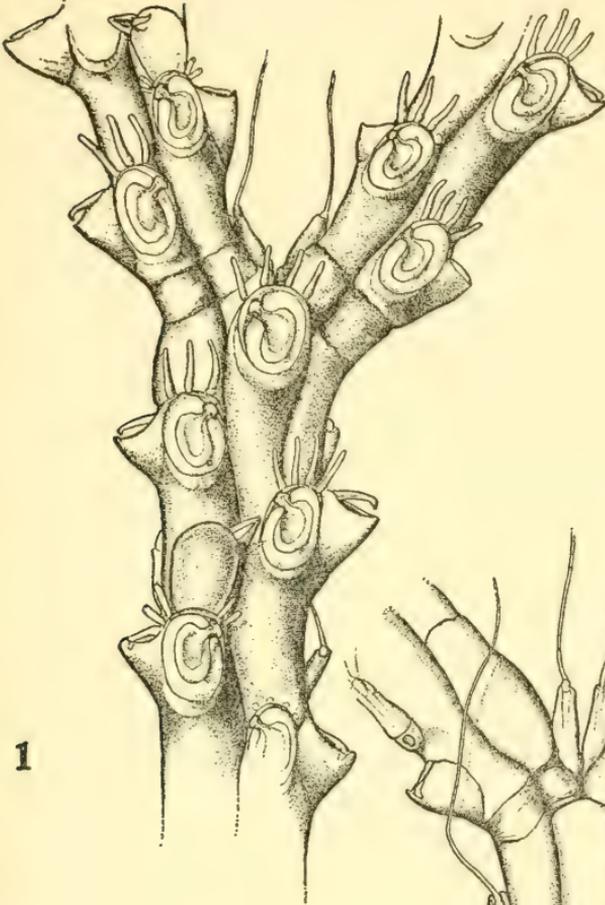


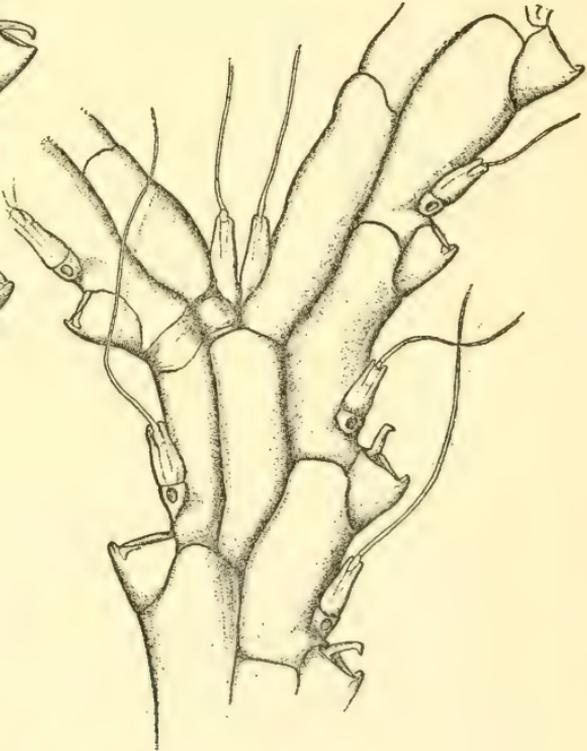
PLATE 3

Fig. 1. *Scrupocellaria harmeri*, new species, frontal view.

Fig. 2. The same, dorsal view.



1



2

PLATE 4

- Fig. 1. *Scrupocellaria bellula*, new species, details of frontal view, zooecia, scuta and spines.
- Fig. 2. The same, details of the ovicell.
- Fig. 3. The same, proximal zoecium of an internode, with a radicle at the proximal end of the second zoecium.

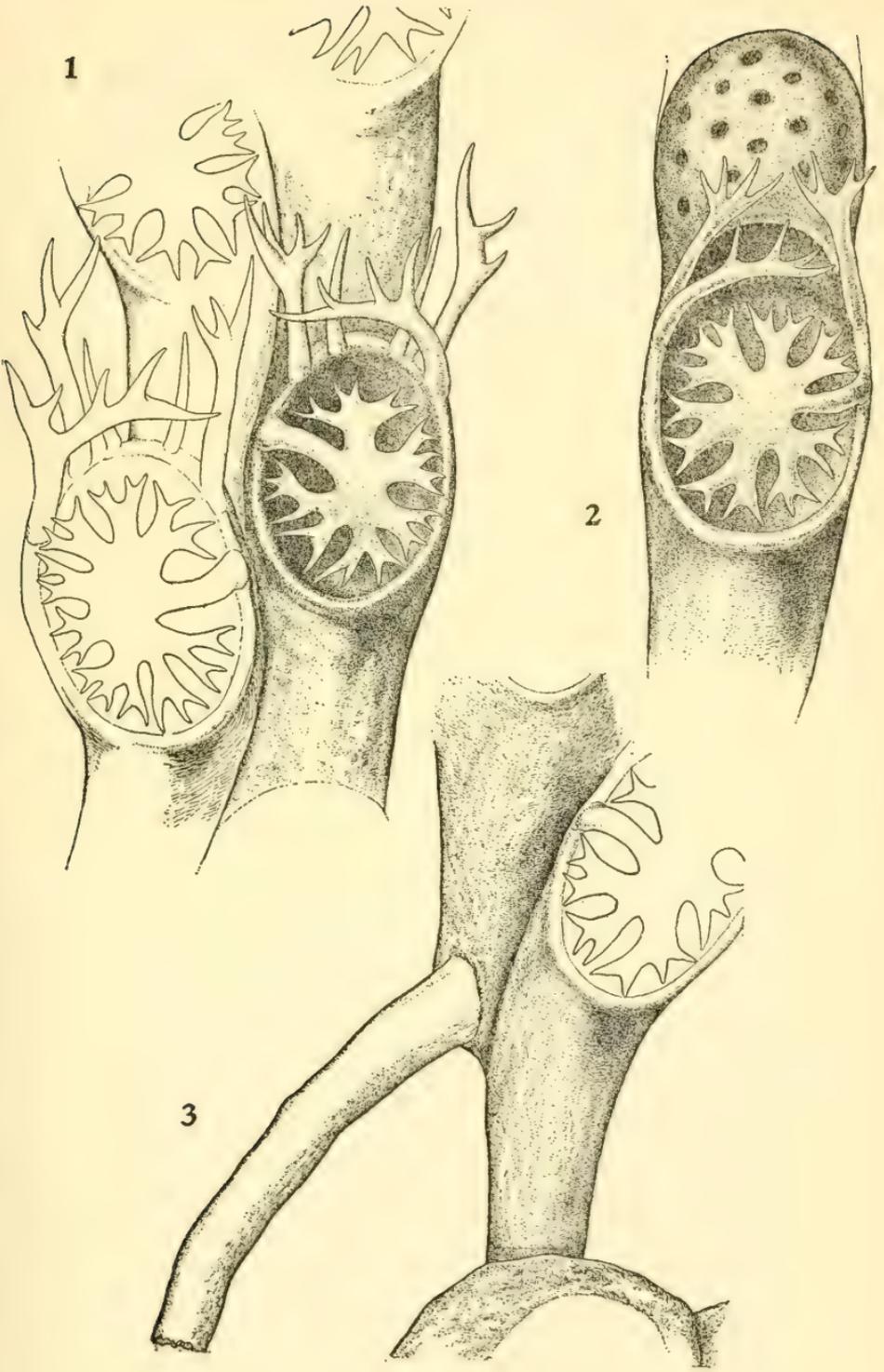


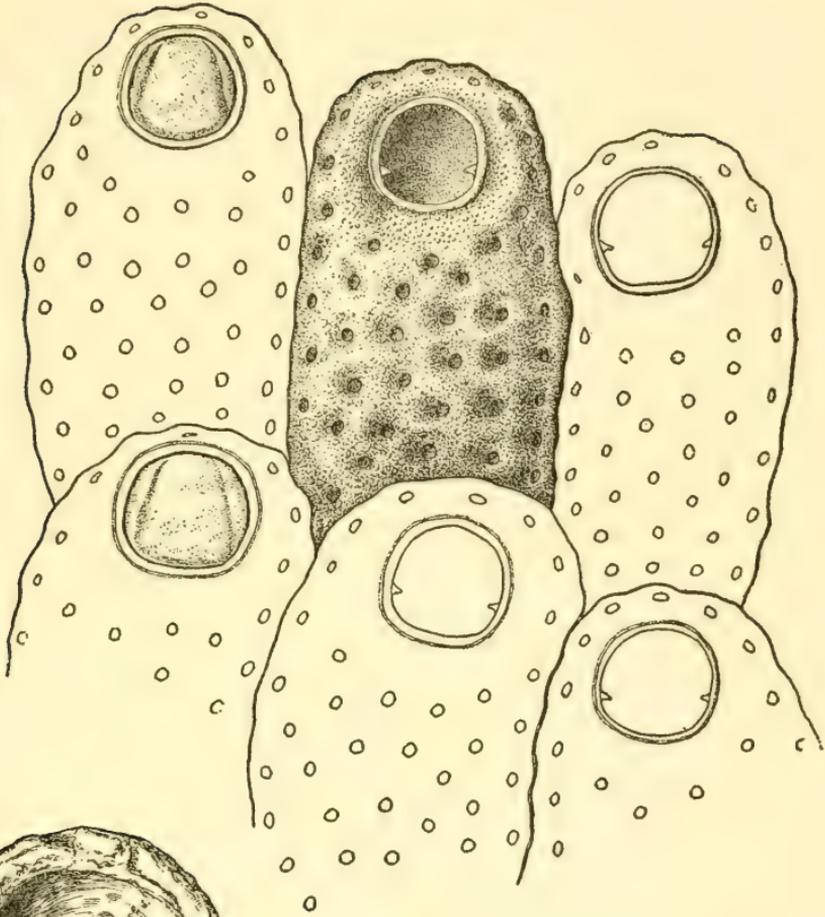
PLATE 5

Fig. 1. *Cycloperiella rosacea*, new species, arrangement and details of zoecia.

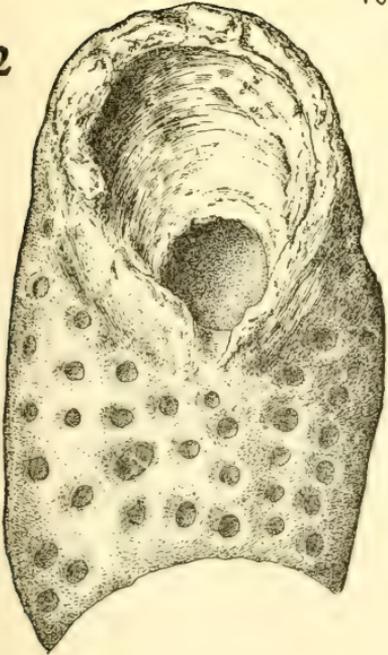
Fig. 2. The same, somewhat more enlarged, with broken ovicell.

Fig. 3. The same, underside of operculum.

1



2



3

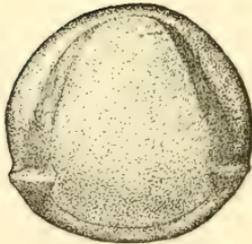
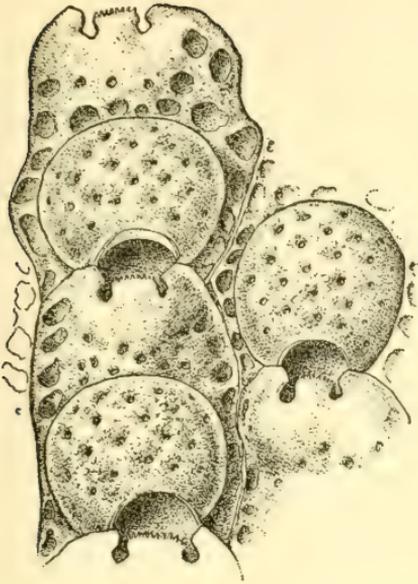
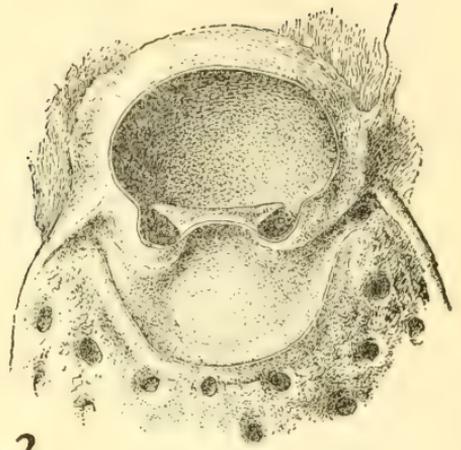


PLATE 6

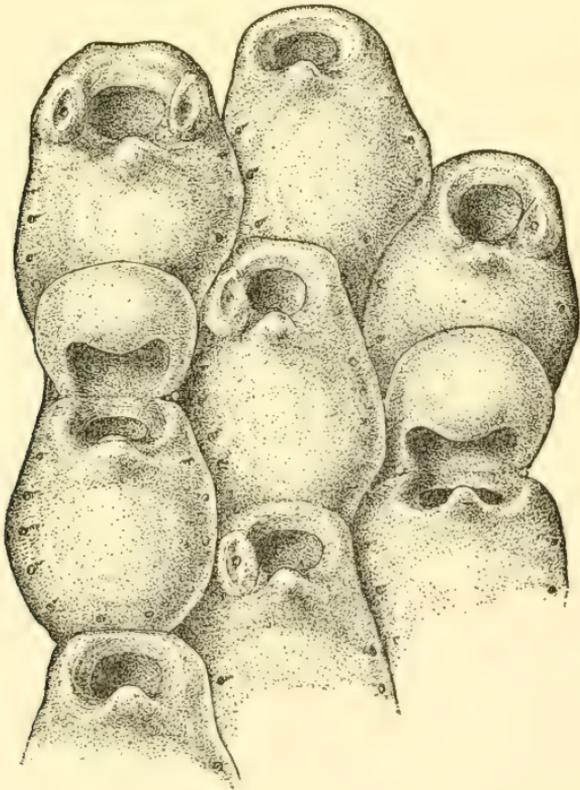
- Fig. 1. *Smittina smittiella*, new species, arrangement of zooecia, with detail of ovicell and the overhanging serrated rostrum of the suboral avicularium (the mandible of the avicularium is hidden beneath the rostrum).
- Fig. 2. The same, a young zooecium, more enlarged, to show the form of the primary aperture, lyrula and base of the undeveloped avicularian chamber.
- Fig. 3. *Aimulosia floridana*, new species, details of zooecia and oocia.



1



2



3

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