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SOME HYDROIDS OF SOUTH CHINA.

BY CHARLES W. HARGITT.

WITH TWO PLATES.

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REPORTS ON THE SCIENTIFIC RESULTS OF THE EXPEDITION TO THE EASTERN TROPICAL PACIFIC,, IN CHARGE OF ALEXANDER AGASSIZ, BY THE U. S. FISH COMMISSION STEAMER "ALBATROSS," FROM OCTOBER, 1904, TO MARCH, 1905, LIEUTENANT COMMANDER L. M. GARRETT, U. S. N., COMMANDING, IN PREPARATION: —

R. P. BIGELOW. The Stomatopods.
O. CARLGREN. The Actinaria.
W. R. COE. The Nemerteans.
H. J. HANSEN. The Cirripeds.
W. E. HOYLE. The Cephalopods.
P. KRUMBACH. The Sagittae.
G. W. MÜLLER. The Ostracods.
MARY J. RATHBUN. The Crustacea Decapoda.
G. O. SARS. The Copedods.
——. Pteropods, Heteropods.

No. 16.— *Some Hydroids of South China.*[1]

By Charles W. Hargitt.

The material upon which this paper is based was received from several sources. Most of it was collected near Amoy by Prof. S. F. Light and Mr. Arthur Campbell, but a part of it had been sent to Dr. Elof Jaderholm, who in turn sent it to Dr. E. Stechow. Knowing my paper on the Hydroids of the Philippine Islands (1924), Dr. Stechow sent it to me. Both Professor Light and Mr. Campbell urged that I accept their material. For this generosity I tender sincere thanks; likewise to the late Prof. C. C. Nutting acknowledgement is made for the courtesy of comparing certain specimens with the types of his own species.

Mr. Campbell's pertinent note follows: —

"During a period of two years spent in Canton, China, opportunity was offered to collect a number of littoral marine animals of South China. . . . Practically nothing is known of the hydroids of the southern part of China, and very little indeed of the north. The coast of South China is characterized by extensive mud-flats and wide bays, into which deep rivers have cut, out channels. In many places there are numerous islands, some of volcanic rock, some of granite. Most of the specimens in my collections have been taken among the rocky tide-pools and caves on these islands. . . . The absence of large areas of laminarian seaweeds is to be noted. The coasts of China are frequently visited with destructive storms which sweep away many of the familiar habitats of these animals, and often all places even slightly exposed are swept clean of animal life. It is then possible to find littoral forms only in caves or sheltered tide-pools along leeward sides of islands and the mainland."

Hydra vulgaris Pallas.

Campbell refers a number of imperfect specimens to this species; concerning these he wrote: —

"A few specimens of what appear to be typical members of this species have been taken every spring at Amoy, and are used there by members of the University for teaching and research. Those examined by me were preserved and rather shrunken, but they agree with the published descriptions of the species in all respects except that the tentacles are a little shorter than in most accounts. Hence they can be positively identified as the species *vulgaris*.

[1] Contribution from the Zoölogical Laboratory of Syracuse University.

Later specimens were captured in ponds near the college at Canton.

In color the specimens are white (alcoholic). Tentacles number about seven. They were found growing on the stems of various green plants."

Dr. Bedot's paper (Zool. anz., 1912, **39,** p. 602–604) deals with the complicated synonomy of the species of Hydra.

BIMERIA Wright.

Trophosome.— Hydrocaulus erect, branching, with stoloniferous hydrorhiza; hydranths fusiform, or in contraction subspherical. Perisarc usually opaque from the presence of dark, granular mineral matters which cover the outer surface, extending over the basal portion of the hydranths, or in some cases extending over the proximal half of the tentacles.

Gonosome.— Gonophores are sporosacs of variable size and shape, and borne on pedicels arising from stem or branches.

Torrey's reasons (Univ. Calif. publ. Zool., 1902, **1,** p. 26) as to the relation of Bimeria and Garveia and their inclusion in Bougainvillidae are valid and convincing.

BIMERIA AMOYENSIS, sp. nov.

Figure **1.**

Cf. Clarke, Trans. Conn. acad., **1876, 3,** p. **252.** Nutting, Proc. Wash. acad., **1901, 3,** p. **166.** Torrey, Univ. Calif. publ. Zool., **1902, 1,** p. **26; 1904, 2, p. 6.**

There were two lots containing colonies of a hydroid which partook of characters shared in common by several genera, e. **g.** Bimeria, Garveia, and Perigonimus. Those from the first were devoid of gonophores, which left much doubt as to their affinities. Other colonies in the second lot, fortunately bearing gonophores, showed that their proximal relations were with Bimeria, the numerous sporosacs assuring this. Following are distinctive characters:—

Trophosome.— Stems erect from creeping stolons, branching much as in Eudendrium, with heavy ovoid or spindle-like hydranths, bearing short thick tentacles; colony with rather dense opaque perisarc distinctive of the genus; height **10-15** mm. Tentacles apparently a single cycle, ten to twelve in number, upon the bases of which perisarc extended, forming also a bowl-shaped theca about the hydranth base or in some cases half the body.

Gonosome.— Gonophores are sporosacs, borne on short pedicels of stem or branches singly; male elongate, cylindrical, three or four times the diameter varying as to state of development: female ovoid, specimens poorly preserved.

Browne (1907) has described two new species of Bimeria dredged from the northern side of the Bay of Biscay in August 1906 from depths of more than **400** fathoms. The type species, *B. vestita* Wright, was also taken at a depth of seventy-five fathoms. In both these species the stems are described as fascicled, a feature not described of those earlier known. Concerning *B. biscayana* Browne remarks of the gonosome (reported as unknown) that "as the Hydroid was found at

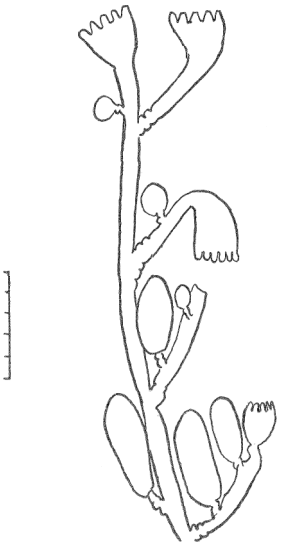

FIG. 1— Bimeria amoyensis Hargitt.
G. T. H., del. 1/100 mm.

a depth of over **400** fathoms, its gonophore is almost certain to be a sporosac." This inference is not obvious, for numerous hydroids of shallow waters, such as Clava, Eudendrium, Cordylophora, are exclusively of the sporosac type, as is that here described taken from shallow waters.

TUBULARIA Linné (in part).

Trophosome.— Hydrocaulus comprising simple or branching colonies of hydroids borne by stoloniferous or reticulate hydrorhiza. Hydranths generally flask-shaped, sharply differentiated from the stem, tentacles comprise two series — a basal or proximal series, larger than the oral or distal series. Usu-

ally both of these are comprised of simple filamentous organs arranged in cycles or whorls. The basal surrounding the base of the polyp, the oral surrounding the mouth of the polyp; both these series are usually simple, the latter often in two or more series making up closely articulated whorls.

Gonosome.— The reproductive organs form sporosacs which are borne upon branched stems or peduncles, forming clustered or raceme-like masses arising from the body of the hydranth between the two series of tentacles. These reproductive organs are medusoid in form, but never become detached from the body of the hydranth. Development takes place within these medusoids, the shape and character of which may be often recognized in their form. The embryos are liberated as larvae known as actinulae.

TUBULARIA MESEMBRYANTHEMUM Allman.

A fine colony of this hydroid was taken from the bottom of a Chinese junk in March 1924 by Messrs. Wu and Yuh at Amoy. The specimens were preserved in 10% formalin and as a consequence, while preserving the specimens satisfactorily, many of the hydranths had fallen from the stems when the collection was received and thus they were more or less injured.

Trophosome.— The colony large and complexly connected by a reticulated rhizocaulus; hydrocaulus is of the usual type, stems mostly simple or sparingly branched, bearing at the summit the large flask-shaped polyp, each stem reaching a height of 35 to 50 mm. Hydranths large and with the usual two series of tentacles, the basal large, filiform, tapering to an acute point and numbering from about twenty to twenty-five. The distal or oral series about the same, but are relatively short, apparently contracted by the preservative.

It may be noted in this connection that little taxonomic importance can be attached to the number of tentacles, as this varies greatly in different specimens, depending upon their age and size.

In a species described by Inaba (1890), and designated by Stechow (1913, p. 52), as *Tubularia mesembryanthemum*, tentacles are stated to be, oral ten, basal twenty. The specimens described must have been quite immature, as the specimens under consideration average twice that. I can distinguish no other incompatibility between the specimens here described and those of Inaba and Stechow, except that of the numerical differences in these organs, an entirely inconsequential difference.

Gonosome.— Medusoids borne in raceme-like clusters from the body of the hydranth just above the circle of basal tentacles. In form the medusoids are barrel-shaped, about twice as long as broad and resemble very much those of

the familiar *Tubularia crocea*, though apparently rather more degenerate. Actinulae were easily distinguishable within the bell-cavity of the sporosacs.

I studied this species at Naples, following its life history throughout and including in some detail the embryology as well as the morphology.

TUBULARIA SPHEROGONIA, sp. nov.

Two lots were collected at Amoy, on rocks at low tide, by Mr. Light whose care in their preservation left nothing to be desired. The colonies were made up of a complex mass of reticulate stolons and stems, the latter usually devoid of branches.

Trophosome.— Stems simple or rarely branched, erect, from 20–40 mm. high; perisarc rather delicate, with occasional annulations at base, and sometimes at about middle, and often with a distinct series at the upper end, and apparently constricting the apex. Hydranths large, flask-shaped, and with the usual basal series of filiform tentacles, twenty to twenty-five in number, large, but tapering to acute tips; the oral series delicate, forming a close whorl about the mouth, in number the same as the basal series. The number varies with size and maturity of the polyp.

The hydrorhiza is complete, forming an intricate network resulting in a dense colonial mass characteristic of tubularians.

Gonosome.— The medusoids are mere sporosacs (male), very numerous, borne in series, on short pedicels, and subspherical, with merely rudimentary tentacular buds. Manubrium and marginal canal distinguishable, but radial canals apparently absent.

This hydroid is an interesting one, especially in the shape of the medusoids; all those known to the writer being ovoid elongate, and with organization quite distinctly medusoid; the name proposed designating the unusual shape of the gonophores.

HYBOCODON Agassiz.

Trophosome.— This consists of a simple hydrocaulus, arising from a stolon-like hydrorhiza. Hydranths flask-shaped, sharply demarcated from the supporting stem; there are two series of tentacles, the aboral, long and filamentous, a single whorl about the base; the distal, or oral series forming two or more whorls about the mouth.

Gonosome.— Medusae are borne on peduncles which arise from the body of the hydranth between the basal and oral tentacles. At the period of liberation the medusae are bell-shaped, with a well-developed manubrium, four radical canals, and usually a single large tentacle produced from one of these, which results in an unsymmetrical shape of the bell.

HYBOCODON AMOYENSIS, sp. nov.

Plate **1,** fig. **3.** Figure *2.*

In the collection was a most interesting specimen, taken by S. F. Light at a wharf near Amoy, October **24,** 1922. It was among the specimens of Athecata which Mr. Arthur Campbell had studied, and designated as a new species of Tubularia. My investigations made it evident that not only is the species new, but that it belongs to Hybo-

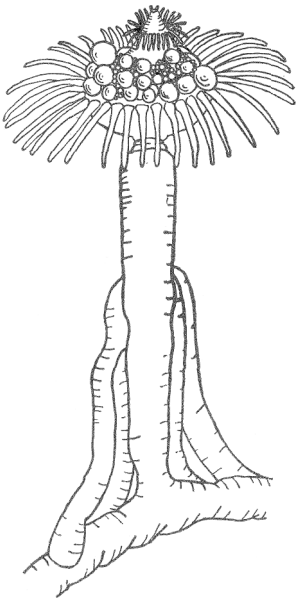

FIG. 2.— Hybocodon amoyensis Hargitt. A. C., del. About 5 times.

codon. The hydroid characters, coenosarcal canals of the stem, the perisarc, and the medusoids were of such maturity as to show distinct asymmetry, and the single large tentacle revealed its Hybocodon affinities. In size, aspects of structure, etc. it strongly resembled the typical characters of *H. prolifer* of L. Agassiz. But it has also features which distinguish it from that species, notably the peculiar supporting braces which are well shown in both the sketches and photographs of

Campbell's account. Other features are specified in the following description by Mr. Campbell: —

"The lower part *of* each main polyp-bearing stem is buttressed with from two to four auxiliary stems which originate independently from the hydrorhiza, but close by the base *of* the main stem, and unite with the latter at varying levels. As a rule the union occurs at about one third the height of the main stem, seldom much below that level; sometimes, however, as high as two-thirds as far up as the height of the stem. In most cases these auxiliary stems are less in diameter than the main stem; but in some specimens almost equally stout. In examples with two auxiliary stems these unite with the main stem at the same level. Where there are more, this is the case with the outermost pair, but the inner ones may be united just below the other pair. In all cases these auxiliary stems originate from the hydrorhiza close to the base of the main stem; the inner ones form a short basal bridge and lie in close contact with the latter throughout their entire length up to the point of junction. There are never more than two pairs. The outer pair are in close contact with the inner ones. Neither the main stem nor the basal auxiliary stems are ever branched. But both the main and auxiliary stems are closely ringed throughout their length with exceedingly narrow annulations."

This description with the exception of the last sentence or two is correct. As to the last statement, I find no evidence of annulation of the perisarc of these structures, and the account of the tentacles is also defective. Careful dissection under the microscope shows that in an average-sized specimen the basal tentacles average thirty-six, and the oral tentacles are in two series and with a total average of about eighty.

Of the gonophores Campbell states that they are "sporosacs," but a more critical examination would have shown them to be medusae, and further that these were unsymmetrical, which takes the hydroid out of the Tubularidae, or at least out of Tubularia, and allies it at once with Hybocodon.

But in spite of these rather marked contrasts, there remain strong points of likeness. Matters of size are often mere expressions of conditions of environment of similar influences. The most obvious feature of distinction is the presence of the auxiliary buttresses described by Campbell and shown in Plate 1, fig. 3. The presence of stoloniferous accessories are well known in many hydroids, some of which may serve as support, as in the present case. May it not be probable that those so conspicuous here are provisions of the organism to meet a possible emergency involved in the somewhat local habitat, namely, the exposure to all sorts of surroundings and exigencies of the wharf or pier, subjecting the specimens to the surge and swash incident to such a con-

dition? In such an environment solitary polyps unused to such exposure might well develop such braces as stays or props to support the large hydranths. A single case could hardly call out such a unique and unusual expression of adaptation, but if, as mentioned by Campbell, the region is liable to the frequent storms he describes, the performance may have come into use as a consequence. This is only a tentative suggestion, but is made as a reason for future observation when collecting in such unusual situations. In the original description of *H. prolifer* by L. Agassiz emphasis was given to the habitat in which they were found, namely, deep and pure waters and where there was protection from heavy waves (Cf. Contrib. nat. hist. U. S.,1862, 4, p. 243). Specimens of this hydroid have been taken by collectors at the U. S. Fisheries Laboratory, Woods Hole, and the medusae occur in abundance during the spring and summer at Woods Hole, and off Nantucket and Crab Ledge. From these medusae, bearing eggs and larvae in all phases of development, I am able to correct some incidental errors of the original description of Agassiz, such for example, that young medusae "arise singly on very short peduncles direct from the body of the parent hydranth." On the contrary medusae arise on peduncles which branch, producing numerous medusae, as in Tubularia and Ectopleura, but never in dense and pendulous racemes characteristic of the Tubularidae.

These observations are also true of the species from Amoy, as shown in Figure 2, and Plate 1, fig. 3. However, the medusae appear in succession and not in vast numbers as in many other tubularian hydroids.

Trophosome.— This comprises a series of more or less independent hydroids, borne from a creeping hydrorhiza which may branch, and, at intervals, give rise to other polyps, thus forming a sort of colony of more or less detached individuals.

These are very similar to those of *H. prolifer*, as described by Agassiz (1862, 4, p. 244, pl. 25) but are smaller. For example, *H. polifer* averages 50 mm. in height, while *H. amoyensis* only 20 mm. In the former the stems are about 1 mm. in diameter at the base and 2 mm. at the top; while in the latter they are 7 mm. at the base and 2.1 mm. at the top.

Hybocodon prolifer has its habitat only in purest sea-water, and in pools protected from heavy waves, from which it was inferred that in general it was of deep water habit, and later facts sustain this view. In the present species the habitat seems very different — among marine organisms on a wharf, a habitat likely to be subject to pollution and more or less buffeting by waves.

So far as certainly known Hybocodon *prolifer* has not been found beyond its original habitat, viz. the coast waters of Massachusetts Bay, and adjacent localities.

Bonnevie (1899, p. 28) has described a hydroid, Tubularia *prolifer*, but the description leaves serious doubt as to its identity. Both in the descriptive account and figures it has distinctive tubularian features, rather than those of Hybocodon; the medusa, however, has closer resemblance to that of Hybocodon.

Browne (1905, p. 752) has recorded the occurrence of the medusae in Loch Ranza, Arran, 1901, during April and May, and in 1902, April 3 to June 11. He states that "The hydroid Hybocodon *prolifer* has not yet been found in British waters. To judge from the abundance of the medusa and the presence of free-floating actinulae, the hydroid is almost certain to live in the Firth of Clyde, probably in the neighbourhood of Arran."

Hartlaub (1907, p. 98, 102, 103) describes the distribution of the medusae, and designates Bonnevie's *H. prolifer* as a new species, Hybocodon *christinae*.

H. B. Bigelow (1913, p. 6) notes the occurrence of the medusae of a Hybocodon believed to be *prolifer* in Dutch Harbor, Northwestern Pacific, 1908. He briefly reviews the distribution of both the hydroid and medusa, including his own finding as above, — "The Hybocodons of the fisheries Steamer Albatross collection can be identified only provisionally, until the hydroid is known. But as the medusae agree perfectly well with *prolifer* they are referred to that species."

EUDENDRIUM Ehrenberg (in part).

Trophosome.— This comprises a plant-like hydrocaulus, more or less symmetrical, borne from a creeping stoloniferous hydrorhiza. Hydranths oval or flask-shaped, with the hypostome expanded into a trumpet-like proboscis; a single series of tentacles, filaments in shape, surrounds the base of the hydranth.

Gonosome.— Sporosacs are developed from the body of the hydranth or from the hydrocaulus. Male sporosacs usually form a cycle of bead-like filaments around the base of the hydranths; female sporosacs appear singly, the contained egg being easily distinguishable by the microscope.

EUDENDRIUM CALIFORNICUM Torrey.

Plate 1, fig. 4.

Eudendrium californicum Torrey, Univ. Calif. publ. Zool., **1902, 1,** p. **32.** Fraser, Bull. Lab. nat. hist. State univ. Iowa, **1911,** 6, no. **1,** p. **24.** Trans. Roy. soc. Canada, **1914, 8, p. 121.**

Mr. Campbell collected a good example of this species, of which he has made the following record:—

"It agrees closely with *Eudendrium californicum* Torrey. The species resembles *Eudendrium vaginatum* Allman closely, but differs in that the annulae are distinctly narrower about the stem and branches, and in the general habit which is free and graceful.

Trophosome.— The stems are stout, simple and erect, reaching a height of about **140** mm. in a mature colony. Each stem ascends in a loose spiral, giving rise to branches at frequent intervals in all planes. Hydranths usually with about **20** tentacles, borne on secondary branches. Color in life flesh-pink. Intertwined among the branches of this colony are typical specimens of *ampanularia urceolata* Clarke, common in California and at Hong Kong."

EUDENDRIUM PUSILLUM AMOYICUM, var. nov.

Plate 1, fig. 1.

Specimens of this form were found among a mass of various hydroids, Obelia, Plumularia, etc., Algae, and Bryozoa. They have features both of structure and habitat quite like that of *E. pusillum* Lendenfeld (1885, p. *352)* of Australia.

Trophosome.— Colonies comprise a creeping hydrorhiza, hydrocaulus erect, profusely branched somewhat irregularly, and rising to a height of **10–15** mm., irregularly and sparingly annulated, branches with two or three rings at base and terminus. Hydranths of typical shape, with trumpet-shaped proboscis, relatively large and with twelve to twenty tentacles.

Gonosome.— Only female gonophores were present and only in a few specimens. They arise on the body of hydranths as in many well-known species, and as a result the polyps early atrophy as in other species, in many cases leaving the gonophores in clusters on the terminus of branches. Another type appears to arise singly on short pedicels of branches as is also common in other species.

In the small size of colonies and physical aspects of the trophosome the species differs from most other small species known, but resembles most closely that named above, and with varietal features such as to

suggest a new name. In later collections it may be found to be entitled to distinct specific rank.

A specimen of *E. pusillum* from Australia, is devoid of gonophores and so leaves some doubt as to its specific identity with von Lendenfeld's species, though indicating the possibility of specific distinctness, or certainly varietal difference for localized distribution.

PENNARIA AUSTRALIS Bale.

Cat. Austr. zoophytes, 1884, p. 45. Lendenfeld, Proc. Linn. soc. N. S. W., 1885, **9**, p. 593. Cat. Medusae Austr. seas, 1887, pt. 2, p. 34. Bedot, Rev. Suisse, 1916, **24**, p. 169.

Pennaria rosea Lendenfeld, Proc. Linn. soc. N. S. W., 1885, **9**, p. 594, pl. 24, fig. 40–42. Cat. Medusae Austr. seas, 1887, pt. 2, p. 34. Bale, Proc. Linn. soc. N. S. W., 1888, ser. 2, **3**, p. 747. Mayer, Medusae of the world, 1910, **1**, p. 27.

Mr. Campbell collected this species, though the specimens which came under my notice were fragmentary and undeveloped. Some years ago I received from Adelaide, Australia, fine specimens which had been taken in the height of the growing season, the trophosomes large, perfect, and bearing medusae in all stages of maturity. In the same collection there were hundreds of free medusae, and eggs in various stages of development which had been taken with tow-nets. Of these I gave some account in the Journal of morphology, 1911, 22, p. 498. The specimens conformed perfectly with the original description of Bale, but had little in common with von Lendenfeld's original description of *P. rosea*, with which various attempts have been made to identify it, and to give that author a priority of description, though *he* did not at any time, so far as I know, make such claim. Further he recognized Bale's species and listed it prior to his own species, *P. rosea*. Therefore both in fact and in order of description *P. australis* must stand, as it does in the above table of synonomy taken from the Revue Suisse de Zoologie, 1916, p. 169, as the accepted status of the species.

PENNARIA TIARELLA McCrady.

Pennaria tiarella McCrady, Proc. Elliot soc. nat. hist., 1858, **1**, p. 153.

Mr. Campbell states: —

"That this very common American hydroid is represented in my collection by a single specimen from Hong Kong. Its stems arise from a common stolon

and the longest are about 125 mm. long, each main stem branches alternately giving rise to branches of which the oldest are nearest the stock. The side branches may give rise to slightly branched polyp-bearing ramuli on their upper sides. These are annulated at the base with about six or seven rings, and the main stem and branches are annulate beyond each node with an equal number of rings, etc."

Specimens of this hydroid are in the collection made by Professor Light which, though they are rather fragmentary, are identified as this species. The specimens lacked gonophores and apparently were in a state of regeneration following hibernation (?). Having already recorded the occurrence of the species in Philippine waters (Hargitt, 1924, p. 475), this further record shows it to be widely distributed in both Atlantic and Pacific Oceans.

CAMPANULARIA Lamarck (in part).

Trophosome.— Colony simple or branched; hydrothecae distinctly campanulate.

Gonosome.— Gonangia are sporosacs, from which planulae emerge.

CAMPANULARIA URCEOLATA Clarke.

Proc. Acad. nat. sci. Phil. **1876,** p. **215.** Nutting, Proc. Wash. acad., **1901, 3,** p. **172.** Torrey, Univ. Calif. publ. Zool., **1902, 1,** p. **54.** Fraser, Bull. Lab. nat. hist. State univ. Iowa, **1911, 6,** no. 1, p. **33.**

Campanularia cylindrica Clarke, Trans. Conn. acad., 1876, **3,** p. **25.**

Campanularia reduplicata Nutting, Proc. Wash. acad., **1901, 3,** p. **172.**

Specimens of this interesting hydroid were found associated with a colony of *Eudendrium californicum* by Campbell at Hong Kong Harbor landing pier. It conforms closely with the descriptions of the above-named authors, though wholly devoid of gonosomes. Specimens agreeing quite closely with Torrey's description, especially with that of the unusual variability of the hydroid, may account for the several species designation made by earlier authors. It is worthy of note that so far as known the species is strictly symbiotic, always associated with other hydroids.

CLYTIA Lamouroux.

Trophosome.— In colonies, simple, or with branching stems, sometimes quite complex and of considerable size, hydranths usually flask-shaped and with

trumpet-like proboscis. Hydrorhiza usually a stoloniferous network spreading over the substratum.

Gonosome.— Gonangia producing bell-shaped medusae which have a small menubrium, four tentacles, and eight lithocists.

CLYTIA MINUTA (Nutting).

Campanularia minuta Nutting, Bull. U. S. F. C., 1901, **19,** p. **345.**
Clytia minuta Fraser, Bull. Lab. nat. hist. State univ. Iowa, 1912, **6,** no. **3, p. 44.** Nutting, Amer. hydroids, 1915, pt. **3,** p. 61.

These specimens were taken at Amoy along with several species of hydroids, most of which were devoid of gonangia which renders precise

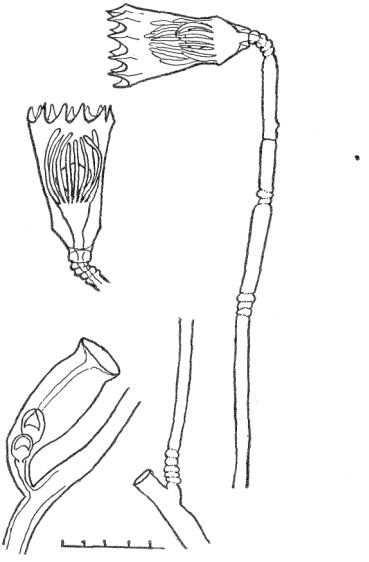

FIG. 3.— Clytia stechowi Hargitt.
G. T. H., del. 1/100 X.

identity of species or genus doubtful. In this case, however, the species seems to agree in most respects with that described by Nutting with the following characteristics :—

Trophosome.— Hydrocaulus sparingly branched, arising from creeping stolons often attached to other hydroids; stems annulated at the base and at regular points above and again at the origin of the hydrotheca; branches also ringed at their base, but the stems not thus characterized. Hydrothecae obconi-

cal, about twice as long as broad at the orifice, and with ten sharp teeth, largest specimens 5–6 mm. high.

CLYTIA STECROWI, sp. nov.

Figure 3.

Light's collection contained a small colony of a very minute campanularian hydroid which appears to be undescribed.

Trophosome.— Stems, simple, unbranched, with creeping hydrorhiza dark brown in color and dense in structure. Stems slender and delicate, annulated at base and apex, and usually two intermediate places, each bearing a single hydrotheca which is goblet-shaped, with a diaphragm, as in the genus generally, with about ten acute teeth; the hydranth of typical form and character. The whole about 5 mm. in height.

Gonosome.— Gonangia arise from the stolon, are slender and bear medusae of typical aspect (Figure 3).

The hydroid has apparently close relations to *C. elongata* of Marktanner-Turneretscher, (1890, p. 215), but differs in size and the character of hydrothecal teeth. It also resembles even more closely *C. ulvae* Stechow, (1919, p. 47–48), but again differs in size as the above. Again the absence of gonosome in each of them leaves the specific relations quite doubtful. It is a pleasure to name the species in honor of Dr. Stechow whose work in this field is so remarkable.

OBELIA Peron and Lesuer.

Trophosome.— Colony plant-like arising from stoloniferous hydrorhiza; hydrothecae campanulate, with distinct diaphragm; hydranths somewhat flask-like with trumpet-shaped proboscis.

Gonosome.— Gonangia borne on stems and branches on the hydroid, in some species on the hydrorhiza also. Medusae disk-like with four radial canals, a four-lipped manubrium with numerous marginal tentacles which increase in number with growth.

OBELIA GRACILIS Calkins.

Proc. Bost. soc. nat. hist., 1899, **28**, p. 353. Fraser, Bull. Lab. nat. hist. State univ. Iowa, 1911, **6**, no. 1, p. 39. Nutting, Amer. hydroids, 1915, pt. 3, p. 78.

A single small colony was taken. In one respect there is a slight difference, namely the downward extension of the diaphragm, to which Calkins attaches some importance, as well as a support for the hydranth, though I cannot recognize it in this specimen. However, in the descriptions of Torrey and Fraser I do not find this point mentioned. It does not seem, therefore, an important feature. In other respects the

specimen compare very well with that of *O. gracilis.* This with certain others to be noted in other connections is interesting as showing identity of those from Chinese waters with those of the California coast.

OBELIA EVERTA, (?) sp. nov.

Figure 4.

This species is somewhat uncertain owing to the fact that the gonosome is lacking and therefore the decision of whether it is really new may be left for the future. Certain features, however, seem to strongly indicate such to be the fact.

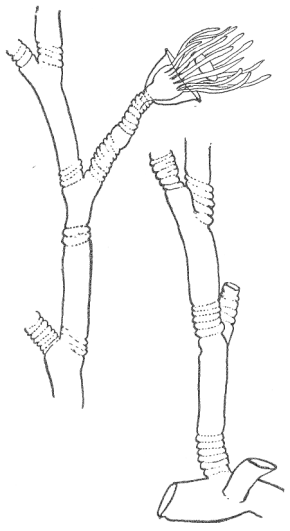

FIG. 4.— Obelia everta Hargitt.
G. T. H., del. 1/100 ×.

Trophosome.— Specimens are well developed about 20 mm. high, stems undulating or zigzag, with branches at each bend of a branch, with a variable number of polyps. Stems annulated just above each branch, the latter also usually completely annulated, ending in the cup-shaped hydrotheca which has smooth margins, and definitely everted rims. Hydranths typical in size, shape, and tentacles. Hydrorhiza comprised of creeping stolons which bear the stems and form attachments to the substrata. Some of the colonies are complexly branched with a most dense, dark-colored perisarc, and with stems in such cases less undulating than described above.

GONOTHYRAEA Allman.

Trophosome.— Comparable with that of Obelia.

Gonosome.— Gonophores are medusoid sporosacs like imperfect medusae contained in gonangia quite similar to those of Obelia.

GONOTHYRAEA INORNATA Nutting.

Proc. Wash. acad., 1901, 3, p. 175. Fraser, Trans. Roy. soc. Canada, 1914, **8,** p. 149. Nutting, Amer. hydroids, 1915, pt. 3, p. 72.

Several colonies of this hydroid were collected by Light from rocks at Amoy, March, **1924,** which in general features conform very well with those originally described by Nutting taken by the Harriman Expedition at Yakutat Bay, Alaska. They differ in certain details, but not such as would warrant establishing a new species; some of its peculiar features are: —

Trophosome.— Hydrocaulus slender, branching alternately, giving a distinctly geniculate aspect to the stem; height 15–25 mm. Hydranths of the usual size and shape, with about twenty filamentous tentacles. Hydrothecae goblet-shaped with smooth margins.

Gonosome.— Gonangia elongate obconical, smooth or with slightly annulated surface. Gonophores are sporosacs devoid of any medusoid features, and with only a single acrocyst in each, carrying several (four to six) embryos, which are liberated as planulae.

HALECIUM Oken.

Trophosome.— Hydrocaulus branching with biserial alternate hydrothecae. These are inconspicuous, for the most part comprising shallow, saucer-shaped hydrophores, borne on pedicels, or sessile upon branches or stems. In certain cases these hydrophores are ornamented with a circle of bright points just below their margins.

Gonosome.— Gonangia of these hydroids are dissimilar in the two sexes, the female often with a pair of hydranths borne from the orifice of the gonangium; male gonangia form mere sporosacs. The larvae of these hydroids escape as planulae, similar to those of Campanularia.

HALECIUM SESSILE Norman.

Rept. Brit. Assoc. for 1866, 1867, p. 205. Hincks, Brit. hydr. zoophytes, 1868, **1,** p. 229, pl. *44,* fig. 2. Inaba, Zool. mag. ***Tokio,*** 1890. Jiiderholm, K. Svenska vet. akad. Handl., 1909, **45,** no. 1, p. 58. Stechow, Abh. K. Bayer. akad. wiss. Math. phys. kl., 1913, **3,** suppl. bd., p. 86.

Trophosome.— The colonies are small, stems delicate, branching very irregularly; about **10** mm. in height, comprised of many short internodes. Hydrothecae sessile, small, opening just below each node with slightly everted mouth and devoid of any glistening points, or reduplications. Hydranths large and stout with about twenty tentacles. Rhizocaulus stoloniferous, somewhat reticulated.

Gonosome.— In these specimens collected October 24, **1923,** gonophores were absent.

HALECIUM CYMIFORME Allman.

Rept. sci. results Challenger, **1888, 23.** Hydroida, pt. **2,** p. **15.** Stechow, Abh. K. Bayer. akad. wiss. Math. phys. kl., **1913, 3,** suppl. bd., p. **84.** Inaba, Misaki hydroids, **1922.**

A second species conforms quite well with Allman's *cymiforme,* except only in size. These specimens are much smaller, averaging only about 10 mm. in height. But in other features they are indistinguishable. The lack of gonangia is a further element of doubt to complete identity, though it agrees quite well with accounts and figures of Inaba. Gonosome lacking. In these specimens as in the preceding, I found no examples of reduplication of the hydrothecae to which Allman referred. And here, as in the former, there were no punctate, bead-like bodies as are found in many other species.

HALECIUM TENELLUM Hincks.

Brit. hydr. zoophytes, **1868, 1,** p. **226.** Clarke, Trans. Conn. acad., **1876, 3,** p. **255.** Nutting, Bull. U. S. F. C., **1901, 19,** p. **347.** Jäderholm, K. Svenska vet. akad. Handl., **1909, 46,** no. **1,** p. **55.** Stechow, Zool. jahrb. Abth. syst., **1919, 42,** p. **41.**

The third species in this series has the colony somewhat fragmentary, some creeping stolons, which tend to become reticulate. Stems very delicate, perisarc transparent, irregularly annulated; branches arise directly from the side of the stem just below a hydrotheca and by a sharp curve ascend vertically. Hydrothecae very shallow with everted margins entirely devoid of punctate bodies referred to in the preceding account. Another feature noted in the above descriptions namely, the prevalent reduplication of hydrothecae, common in many other species, is entirely lacking in these specimens. This with features of branching inclined me to believe that it might be a new species, but absence of gonosomes leaves the matter so uncertain that it seems better to regard

the differences as varietal; at least till other specimens finally warrant a more pronounced decision. Hydranths are of average size, with from twelve to sixteen tentacles. Gonosome absent.

THUIARIA Fleming.

Trophosome.— Stem erect, branching, arising from filiform stolons. Hydrothecae biserial on stem and branches, subopposite to alternate, usually more or less immersed in the hydrocaulus; with smooth margins or with one or two teeth, operculum with one or two valves.

Gonosome.— Gonangia usually ovoid, smooth or with one or two spines on the shoulders.

THUIARIA TUBULIFORMIS (Marktanner-Turneretscher).

Plate 2, fig. 4, 5.

Dynamena tubuliformis Marktanner-Turneretscher, Ann. K. k. nat. hofmus., 1890, **6**, p. 238.

Thuiaria tubuliformis Nutting, Amer. hydroids, 1904, pt. 2, p. 70. Hargitt, Philipp. journ. sci., 1924, **24**, p. 493.

This collection contained several colonies of Thuiaria which on first inspection seemed to differ in specific features, especially the gonangia. Mr. Campbell's data gave the localities as "cave-rocks," Cheung, chau, at "sea-side" and on the shell of a living Mytilus, May **14** and 15, 1922.

Trophosome.— The stems arise from complex stolons, attain a height of 15 to 25 mm. sometimes irregularly and sparingly branched, opposite or alternate, when the latter the stems seem to show a geniculate aspect. Internodes usually bear two or more pairs of hydrothecae, but basal usually a single pair; modes at right angles to the axis and usually quite sharply marked. Hydrothecae subopposite, long tubular, and deeply sunk into the substance of stem or branch; the terminal portion abruptly turned outward ending in large paired teeth, which support a paired operculum. There is great variation as to the number and aspect of stems, length of internodes, etc. A very marked feature is that of the relation of the hydrothecae to branches and stems, namely, the branch at the base of an internode which bears it will have an even number of paired hydrotheca, the internode having an odd hydrotheca in the axis of stem and branch always attached to the stem.

Gonosome.— Gonangia differ rather sharply in the two sexes, a fact liable to lead one astray on first inspection, under the impression that it indicates a different species. The female gonangia in these specimens arise from the basal internodes, and directly from the orifice of hydrothecae, sometimes in pairs

and in other cases singly. They are also larger than the male gonangia; for example, an average female measured 155 microns in length, 65 microns in diameter; in the male the average length is 100 microns, the diameter 40 mm., they also differ in shape; the male being ovoid, the female elongate and spindle-like, in each an elongated neck, the margin of which is beautifully everted. The male gonangia arise from the base of hydrothecae, the adjacent region of the stem or branch.

Marktanner-Turneretscher's original material lacked gonangia, as did also that from the Philippines. Nutting described the gonangia, but apparently did not distinguish the sexual differences which led to my statement **(1924,** p. **493)** "Nutting's figures **are** difficult to understand, since he gives three drawings of the gonangia, all different." I think the present account clears up what hitherto has been obscure, not to say somewhat misleading. As will be noted the specimens here described are much smaller than Nutting's described from several sources and also those from the Philippines (Hargitt, **1924,** p. **493).**

PASYTHEA Lamouroux (in part).

Trophosome.— Hydrothecae biserial, strictly opposite, arranged in pairs or series of pairs in groups upon a given internode, the upper pair usually smaller and differing in shape from the lower; margins bilabiate.

Gonosome.— Gonangia are oval or spindle-shaped, smooth or with rather broad annular rugosities with large openings.

PASYTHEA QUADRIDENTATA (Ellis and Solander).

Plate **2,** fig. **1.**

Sertularia quadridentata Ellis & Solander, Nat. hist. zoophytes, **1786,** p. **57.** Gmelin, Syst. nat., **1791, 1,** pt. **6,** p. **3853.** Lamarck, Hist. anim. sans vert., **1816, 2,** p. **121.**

Pasythea quadridentata Esper Pflangenthiere, **1788, 3,** p. **237.** Lamouroux, Hist. polyp. corall., **1816,** p. **156.** Bale, Cat. Austr. zoophytes, 1884, p. **112.** Lendenfeld, Proc. Linn. soc. N. S. W., 1885, **9, p. 419.** Marktanner-Turneretscher, Ann. K. k. nat. hofmus., 1890, **5,** p. **234.** Nutting, Amer. hydroids, **1904,** pt. **2,** p. **75,** pl. **13,** fig. **4–7.**

Specimens taken by Prof. S. F. Light are in fine condition of maturity and preservation, with all stages of life history in typical perfection. In the following description these features will be shown and details not hitherto given noted at length, so far as discovered.

I described **(1908,** p. **114)** an apparently new species, namely, *Pasy-*

thea nodosa, differing materially from that of earlier authors. No gonangia were present and until the specimens now under review were obtained I still held that the species was distinctly new. But this new material contains almost all known structural aspects of the species hitherto described of varietal nature, and reduces *Pasythea nodosa* to varietal rank. Stechow had **(1913,** p. 150) recognized the validity of P. *nodosa,* honoring it with the author's sketches. Billard in a critical paper **(1924,** p. 56) accorded recognition of the species, and in a later paper **(1925,** p. **96)** gives it varietal rank.

In typical specimens the hydrocaulus arises directly from the stoloniferous hydrorhiza which creeps rather promiscuously over the frondose sea-weed which is apparently its normal habitat. Hydrothecae are often variable as to size, shape, and orifice. It is obvious that the specific name is based upon the presence of four thecal teeth. This is not always easy to recognize. Fraser states that these may be only two or three in number, though four is apparently typical.

Typically the stem is made up of basal internode with a single pair of hydrothecae; the second internode usually comprises two pairs of hydrothecae; the third with three pairs, then probably the fourth with four, with the following bearing three pairs, and last a terminal with two or perhaps a single pair of hydrothecae. The average internodes are about five, though not infrequently as many as eight, rarely nine or even ten are found. Rarely stems are branched as shown in (Hargitt, **1908, 14,** p. **116,** fig. 15).

Gonosome.— In this collection are abundant gonangia and they show the typical generic aspects described by Bale **(1884,** p. **112).** "Gonothecae smooth *or* transversely ringed." But in his account of *Pasythea quadridentata*, Bale states that he had "not met with the gonothecae" and that his "description of them is in accordance with Lamouroux' figure." As will be seen (Plate **2,** fig. **1)** there is considerable variation in shape and size, yet there is a typical average. And it will be noted that there is not the deep and sharp corrugations shown in figures of Nutting **(1904,** pl. **13,** fig. **5;** and Fraser, **1912,** fig. 35), that some are devoid of annulations. Usually there is a single gonangium on a stem, borne at its base; but rarely have I found two such rising close together on the base as will be noted in some of the figures.

Habitat. — Usually this has been recorded as on floating sea-weed, but this collection contains a few specimens attached to pebbles, the only case I have noted as varying from that usually accorded to it.

PASYTHEA DUBIA, sp. nov.

Plate 1, fig. 5.

At Hong Kong May 15, 1922, was taken (by Campbell) a small colony of Pasythea apparently new, though with certain doubtful features to be noted in later connection. Its habitat was, like that of *P. quadridentata*, on the floating sea-weed, over the fronds of which it crept in the same fashion. The following are distinctive features: —

Trophosome.— Stems simple, of varying height from 10–15 mm., arising from a creeping stolon from spurs of which they spring. As in the former species, the stems are composed of a series of segments (Plate 1, fig. 5), made up of hydrothecae in pairs, usually in this species a single one to each segment, or internode. But in nearly every case certain internodes will bear two, three or rarely four, hydrothecae. Nodes are of two sorts, the simple or right-angled, or as in the former species, oblique; in the latter when composed of two or three pairs of thecae. In cases of but one pair on an internode there will seem to be lacking a definite nodal joint in many cases. Hydrothecae are very similar to those of the former species as to size, shape, etc., but slightly smaller and with but two teeth which are lateral, and no definite opercular valves.

In size this species is slightly smaller than *P. quadridentata*, by about 25%, as determined by series of measurements.

In this species the gonosome is lacking, which leaves some doubt as to specific distinctness, yet other characters seem sufficient to make rather certain its specific difference.

The species is remarkable for its high variability.

DIPHASIA Agassiz (in part).

Trophosome.— Hydrocaulus similar to others of the Sertularidae, hydrorhiaa a creeping stolon, from which stems arise. Hydrothecae in biserial, opposite or alternate, aperture wide, with single adcauline operculum.

Gonosome.— Gonangia conspicuous often with spines over the surface; they differ in the two sexes, that of the female with an internal marsupium; male smaller, and with tubular orifice.

DIPHASIA DUBIA, sp. nov. (?).

Plate 1, fig. 2.

Very small colonies of this hydroid, with fragments of *Pasythea quadridentata* and other hydroids, but devoid of gonangia, makes definite specific determination doubtful. In general it resembles D.

attennata Hincks, in its trophosome aspects, the more delicate, and apparently immature. The tendency to bear terminal tendrils, after the manner of several other species, *e.* g. D. *fallax* and *D. attennata,* is also found in these specimens. But the hydrothecae, while like D. *attennata* in diverging from branch or stem for about half their length are much more abruptly divergent, almost at right angles, while in the former species this is very gradual and gently curved.

Billard has described (1920, p. 144) a very minute species, D. *minuta,* 0.5 cm. high, which resembles D. *dubia,* though its minute size, as well as other features, is in rather marked contrast to *dubia.*

The following are distinctive characters of the species: —

Trophosome.— Stems mostly simple, or with occasional branches, arising from stoloniferous hydrorhiza, which creep over other hydroids, or similar supports. A feature already noted, that is, terminal tendrils, are frequently present. Hydrothecae are of the usual Diphasia aspect, adnate to stem or branch for half their proximal length, then sharply divergent, and with smooth margins, closed by adcauline opercula, a single pair on each internode.

Gonosome.— Not present in these specimens.

In view of the lack of gonosomes it seems best to designate the species as doubtful, leaving final confirmation to material in which gonangia are present.

PLUMULARIA Lamarck (in part).

Trophosome.— Hydrocladia, unbranched, pinnately arranged, either alternate or opposite, devoid of accessory branches, each bearing more than one hydrotheca, the latter with smooth margins. All of the nematophores motile.

Gonosome.— Gonangia, borne on the hydrocaulus or hydrocladia, simple and flask-shaped.

PLUMULARIA BADIA Kirchenpauer.

Plumularia badia Bale, Catalog Austr. zoophytes, 1884, p. **128.**

Several colonies were found among a mass of other hydroids having the following general features; the stems arising from complex root-like hydrorhiza are of dense and horny texture, height 40–50 mm. or more; from the main stem are given off at irregular intervals branches, both of which are divided into segments or internodes, which bear two to three hydrotheca, and divided by oblique nodes. Hydrocladia are also borne on the main stem as are its branches. The general aspects of the trophosome resemble that described by Billard, but in distinctive details there seems to be specific differences.

Only two gonangia were found apparently attached by foot pedestals to the stem contiguous to the point of origin of a hydrocladium. These seem to be immature and are rather small, obconic in shape and truncate at the apex.

PLUMULARIA LAGENIFERA Allman.

Journ. Linn. soc. zool., 1885, 19, p. 157, pl. 26, fig. 1–3. Nutting, Amer. hydroids, 1900, pt. 1, p. 65. Fraser, Bull. Lab. nat. hist. State univ. Iowa, 1911, **6**, no. 1, p. 82. Trans. Roy. soc. Canada, 1914, ***8***, p. 209.
Plumularia *californica* Marktanner-Turneretscher, Ann. K. **k.** nat. hofmus., 1890, **5**, p. 255, pl. 6, fig. 4.

This hydroid was found growing on fronds of Algae, the hydrorhiza creeping over the fronds, and from the stolons stems rising to a height of ten to twenty mm., unbranched, composed of a series of internodes, each of which bore a single hydrocladium at its distal node, alternating with that of the next, and thus giving a pinnate effect of the delicately beautiful organism. Each hydrocladium arose from a stout spur of the distal end of the internode and bore from two to three minute cup-like hydrothea, with a pair of supracalycine nematophores at its articular surface. Each hydrotheca bore a median nematophore.

Gonosome.— Gonangia (male) are borne on the spur from which hydrocladia arise, are ovoid in shape, about as long as the internode with a long terminal pore from which the contents escape.

PLUMULARIA SETACEOIDES Bale.

Cat. Austr. zoophytes, 1884, p. 136.

Several fine colonies of this hydroid were taken and identified as belonging to this particular species described by Bale. Sometimes unbranched, **30–50** mm. high, from a network of stolons. Stems, dark brown, made up of regular internodes and marked by distinct transverse nodes each with a single hydrocladium borne on a spur at its distal end, these arranged alternately in pinnate fashion.

Gonangia are lacking in these specimens, but the trophosome seems so similar to that indicated that I do not hesitate to include it as a member of this species, though there are variations which leave some doubt on this point.

LYTOCARPUS Kirchenpauer.

Trophosome.— Stem fascicled; hydrothecal margin toothed or sinuous; mesial nematophores usually with two openings, a perforated opening near the base of the free portion, and the terminal one at the tip.

Gonosome.— Gonangia borne on hydrocladia which are modified to form protective branchlets, often resembling a corbula.

LYTOCARPUS SPECTABILIS Allman.

Rept. sci. results Challenger, 1883, **7**, Hydroida, pt. **1**, p. **43.**
Lytocarpus phoenicius Bale, Cat. Austr. zoophytes, **1884,** p. **27.** Billard, Ann. sci. nat., 1910, ser. **9, 11,** p. 48.

In the outer harbor, Amoy, October 24, 1922, a considerable mass of hydroid material was taken by Messrs. Campbell and Light, among which the most conspicuous and abundant was the above-named species, first described by Allman in full details, and well illustrated, leaving little necessity for additional account here except on points of variation, etc. The specimens here under review agree in general aspects of shape with those of Allman, except in size. These averaged about 50–75 mm. in height, as contrasted by the larger dimensions given by him.

Trophosome.— These specimens arise from a reticulated hydrorhiza; stems fascicled, stout, and branching in a generally opposite, sometimes alternate, fashion, each branch bearing closely set hydrocladial pinnae, forming a beautiful feather-like colony. Hydrocladia are also borne on the main stem and branches.

Hydrothecae, a single one to each internode, rather wide, with open mouth of sinuous form, with anterior parietal fold, and very short intrathecal ridge; mesial nematophore heavy, adnate to the walls of hydrotheca for slightly more than half its height, then extended free as a spine-like process, slightly beyond the hydrothecal margin, with an opening on the upper surface close to the hydrotheca, as well as the terminal pore. In these specimens the nematophores showed delicate threads protruding from their terminal pores.

Bale (1887, p. 87) has strongly asserted the identity of Allman's species with *L. phoenicius* Busk, as does also Billard (1910, p. 49), who gives a figure of the type material in the British Museum. But the material here concerned shows none of the varietal aspects claimed by these authors, and does confirm that described by Allman, especially the hydrothecae,— the main feature challenged.

It is much to be regretted that the specimens are devoid of gonangia, since Allman's figure and description leave much to be desired. In addition this would go far to remove doubt as to the precise specific relations in question. In the circumstances my convictions support the views of Allman and are affirmed without hesitation.

LYTOCARPUS NUTTINGI, sp. nov.

Plate 2, fig. **2.** Figure 5.

It is interesting, not to say unusual, to find in the same collection and taken at the same place and time, two species of this rather rare genus. In general features the species here concerned is very different from the previous one. The former is coarse, heavy, flabellate in shape; the present is delicate, lighter in color and graceful in form.

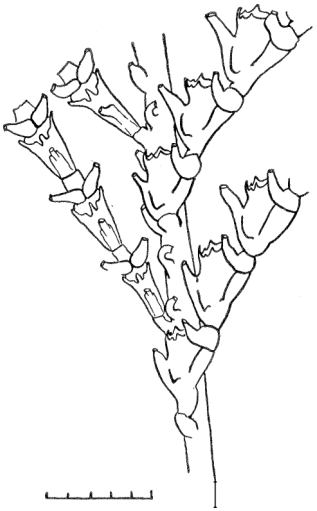

FIG. 5.— Lytocarpus nuttingi Hargitt.
G. T. H., del. 1/100 X.

Trophosome.— Stems erect, fascicled in mature specimens, **4–7** cm. high, branching irregularly. Hydrocladia on both stem and branches, arranged alternately in pinnate order, as in the preceding species. Nematophores borne on both stems and branches. Hydrothecae borne on front or face of hydrocladia, one to each internode. Nodes of stems generally oblique, those of hydro-

cladia square, the margin irregularly toothed, intrathecal ridge but slightly marked.

Gonosome.— Only a few gonangia-bearing specimens found, in these borne on modified hydrocladia, and forming an open or pseudocorbula, similar to that of *L. spectabilis*. The gonangia are borne in a row on the rachis, the cladocarps arching in series on each side.

An interesting feature of the gonangia is the presence of male and female within the same phylactocarp as shown in Figure 5. This statement is made with some hesitation, since in most hydroids the sexual colonies are monogamous, though exceptions are well known. In the case of *Clava leptostyla* I described (1906, p. 211) a case of mixed sex gonophores, or hermaphroditism, and cited other cases of similar character.

HALICORNARIA Busk (in part).

Trophosome.— Stem non-fascicled, no posterior intrathecal ridge, an anterior intrathecal ridge usually present, hydrocladia unbranched, internodes devoid of septal ridges.

Gonosome.— Gonangia borne on stem or on bases of hydrocladia, not replacing hydrothecae, and not protected by corbulae or phylactocarps.

HALICORNARIA SPECIOSA Allman.

Mem. M. C. Z., 1877, 5, p. 74. Nutting, Amer. hydroids, 1900, pt. 1, p. 127.

Fine colonies of this hydroid were collected by S. F. Light, at Amoy, China, 1924. First inspection gave the impression of a single colony of large size, 5–8 cm. in height, but more critical study showed a complex of colonies arising from creeping stolons from which separate stems arose having a height of 3 4 cm. The following are distinctive features.

Trophosome.— Stems erect, arising from a complex stoloniferous hydrorhiaa, in these specimens attached to a dead alcyonarian stem, to a height of 3–5 cm.; monosiphonic, bearing pinnate hydrocladia which appear to be alternate, a pair from each internode and extending in lateral order producing a beautiful frondose aspect. Hydrothecae, one to each internode, are as described by Allman and Nutting.

Gonosome.— These organs are borne in numbers on mature specimens, and in shape as described by the above-named authors. I must differ in one particular as to their location; namely, that each gonangium is borne on the basal internode of the hydrocladium as may be early demonstrated by careful detachment of the hydrocladium from the stem.

AGLAOPHENIA Lamouroux (in part).

Trophosome.— Stems mostly monosphonic: hydrothecae 'with dentate margins: one mesial, and two supracalycine nematophore attached to each hydrotheca.

Gonosome.— Gonangia inclosed in a true corbula which may be closed or open, formed of modified pinnae, the leaves devoid of hydrothecae at their bases.

AGLAOPHENIA AMOYENSIS, sp. nov.

Plate **2**, fig. **3.**

Several colonies of a minute hydroid varying in height from **8–12** mm. were taken by Mr. Light, some with a habitat among sponges and bryozoans, another on the tip of a dead stem of an alcyonarian, which in turn was fairly encased by an undetermined coralline, the whole having the aspect of a miniature palm.

Trophosome.— Colonies small, 8–12 mm. in height arising from stoloniferous base, massed on the summit of a dead alcyonarian stem as noted above, which by continued growth on a restricted area formed the beautiful palmate tuft. Stems segmented, each internode bearing a single hydrocladium from its distal and from which are borne regularly five or six hydrothecae, one to each segment, the margins with about 8 acute teeth. The mesial nematophore directed outward just below the margin of the hydrotheca; supracalycine nematophores rising slightly above the hydrotheca. The basal nodes of the stem are very oblique and deep, those of hydrocladial portions being rectangular and shallow.

Gonosome.— Gonangia borne on the rachis of the corbula and protected by the open arches of the phylactocarps, the outer surface of which bear paired nematophores (Plate **2**, fig. **3**).

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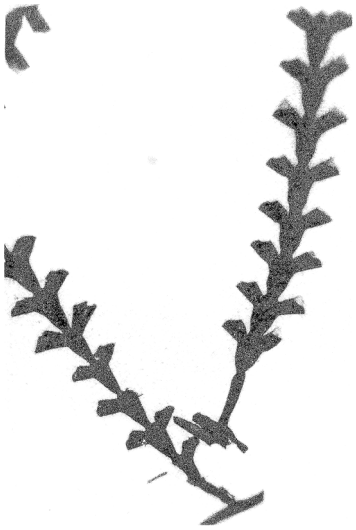
EXPLANATION OF PLATES.

PLATE **1.**

Fig. 1. Diphasia dubia Hargitt.
Fig. **2.** Pasythea quadridentata (Ellis& Solander).
Fig. **3.** Aglaophenia amoyensis Hargitt.
Fig. **4.** Thuiaria tubuliformis (Marktanner-Turneretscher). Male.
Fig. 5. Thuiaria tubuliformis (Marktanner-Turneretscher). Female.



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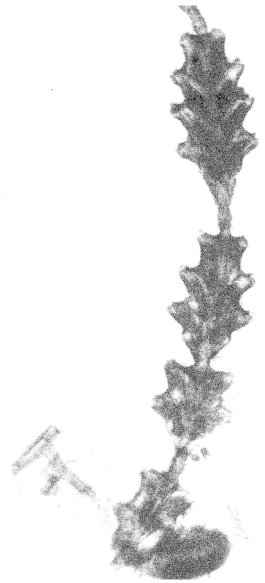

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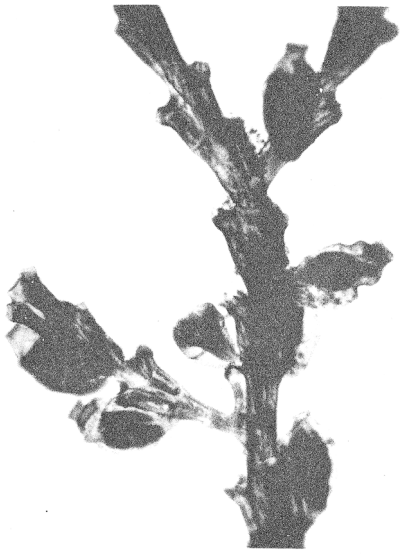

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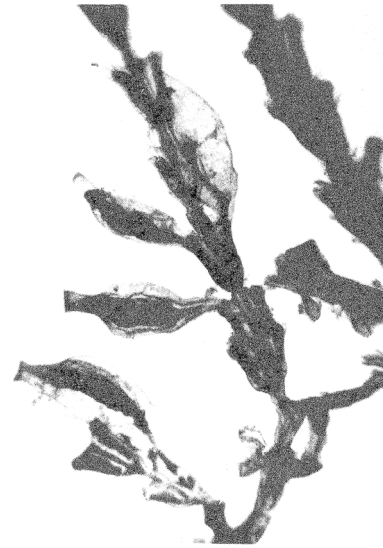

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PLATE 2.

Fig. 1. Eudendrium pusillum amoyicum Hargitt.
Fig. 2. Lytocarpus nuttingi Hargitt.
Fig. 3. Hybocodon amoyensis Hargitt.
Fig. 4. Eudendrium californicum Torrey.
Fig. 5. Pasythea dubia Hargitt.

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The following Publications of the Museum of Comparative Zoology are in preparation:—

Reports on the Results of Dredging Operations in 1877, 1878, 1879, and 1880, in charge of ALEXANDER AGASSIZ, by the U. S. Coast Survey Steamer "Blake," as follows: —

A. E. VERRILL. The Alcyonaria of the "Blake."

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieutenant Commander Z. L. TANNER, U. S. N., commanding, in charge of ALEXANDER AGASSIZ, as follows: —

K. BRANDT. The Sagittae.
K. BRANDT. The Thalassicolae.
O. CARLGREN. The Actinarians.
W. R. COE. The Nemerteans.
REINHARD DOHRN. The Eyes of Deep-Sea Crustacea.
H. J. HANSEN. The Cirripeds.
H. J. HANSEN. The Schizopods.
——. The Ascidians.
S. J. HICKSON. The Antipathids.
P. SCHIEMENZ. The Pteropods and Heteropods.
H. B. WARD. The Sipunculids.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of ALEXANDER AGASSIZ on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N. commanding, as follows:—

G. W. MÜLLER. The Ostracods.
MARY J. RATHBUN. The Crustacea Decapoda.
G. O. SARS. The Copepods.
L. STEJNEGER. The Reptiles.
——. The Corals, Recent and Fossil.

PUBLICATIONS

OF THE

MUSEUM OF COMPARATIVE ZOOLOGY

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Vols. LV., LXVI., LXVII. and LXVIXI., LXIX. of the BULLETIN, and Vols. XLIII., L., LI., and LII. of the MEMOIRS, are now in course of publication.

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Reports on the Results of Dredging Operations from 1877 to 1880, in charge of Alexander Agassiz, by the U. S. Coast Survey Steamer "Blake," Lieut. Commander C. D. Sigsbee, U. S. N., and Commander J. R. Bartlett, U. S. N., commanding.

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieut. Commander Z. L. Tanner, U. S. N., commanding, in charge of Alexander Agassiz.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., commanding.

Reports on the Scientific Results of the Expedition to the Eastern Tropical Pacific, in charge of Alexander Agassia, on the U. S. Fish Commission Steamer "Albatross," from October, 1904, to April, 1905, Lieut. Commander L. M. Garrett, U. S. N., commanding.

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