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SYNOPSES OF NORTH-AMERICAN INVERTEBRATES.

XIV. The Hydromedusæ — Part I.

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Introductory.

The following synopsis was undertaken more than a year ago as a section of the "Synopses of North-American Invertebrates" now in course of publication. Various interruptions have delayed its completion at an earlier date.

While compiled largely from the author's notes and observations made upon the Hydrozoa of the Atlantic coast during a period of more than ten years, the form and method of presentation are patterned after the systematic works of Hincks, Allman, Haeckel, and von Lendenfeld. For many of the descriptive notes recourse has been had to L. Agassiz's *Contributions to the Natural History of the United States* and to A. Agassiz's *Catalog of the Acalephæ of North America*, as well as to those of the authors just named.

The synopsis is confessedly incomplete in several of the orders, specially upon the Campanularidæ and Leptomedusæ. It is, moreover, limited to a comparatively small range of hydrozoan life of American waters, chiefly of the northeastern Atlantic coast. Of that of the Pacific coast our present knowledge is still too limited to warrant even a provisional synopsis.

The Hydromedusæ comprise one of the three generally recognized classes of Cœlentera, of which the others are the Scyphomedusæ and Anthozoa. While the first two classes have been regarded as much more intimately related phylogenetically than has the third, it may be doubted whether after all their relation may not be quite remote, at least so much so as to warrant separate consideration. Hence slight, if any, reference

will be made to the Scyphomedusæ in considering possible relationships or phylogeny among the Hydromedusæ.

The Hydromedusæ may be distinguished by the following somewhat broad characteristics. In typical cases there is a more or less well marked alternation of generations, *i.e.*, a non-sexual, hydroid stage and a sexual, medusoid, stage. The latter are derived by a process of budding from the stem or hydranth of the hydroid as gonophores which may become free as medusæ or may exhibit varying phases of degeneration as medusoids or mere sporosacs, as in Clava, Campanularia, etc.

In many cases there may be exhibited proliferous medusæ from various portions of the parent medusa, as in Hybocodon. In rare cases one or other of these phases may be entirely lacking, as in Hydra, in which the medusa phase is wholly absent, or as in Rhegmatodes and many others the hydroid stage is apparently lacking.

Perhaps in no phylum of the animal world is there a more striking exhibition of polymorphism than among the Hydromedusæ. This seems to reach its climax in the Siphonophora, though in such forms as Hydractinia it is also evident.

In general the hydroid exhibits a sedentary habit quite in contrast with the free-swimming habit of the medusa. But here again are numerous exceptions. Hydra is capable of locomotion, as are also other hydroid forms, while as already indicated many medusæ are sessile and degenerate, and in the Siphonophora the entire polymorphic colony is free-swimming. In general the hydroids are colonial though with notable exceptions, as in Hydra and many others. While in general form the hydroid and medusoid present rather striking morphological differences, they may yet be reduced to a common and fundamental likeness. Both are of diploblastic structure, having a definite ectoblast and entoblast separated by a middle lamella, or mesogloea, which is a delicate, structureless membrane in the hydroid and in the medusa a rather massive, gelatinous structure, making up the bulk of the body and giving it the characteristic glassy appearance.

In the absence of definite knowledge concerning details of the life history of many of the Hydromedusæ, it is as yet

impossible to formulate any scheme of classification which shall bring into a single view the complete ontogenetic relations of the various hydroid and medusoid phases. In the present synopsis I have followed in the main that of Allman and Hincks for the hydroids and that of Haeckel for the medusæ, though in each there is not a little variation both as to the order of presentation as well as the nomenclature used.[1]

SYNOPSIS OF ORDERS OF HYDROMEDUSÆ.

I. Hydrariæ.

Polyps solitary, never forming colonies; no medusoids; sex-cells produced in ectoderm of polyps.

Of this order only a single well-defined genus is recognized, Hydra. The genera Protohydra and Microhydra are probably allied genera, but their affinities are too uncertain as yet to warrant definite classification. The former is of marine habit, the latter of fresh-water habit. Both are devoid of tentacles, and sexual reproduction, at least in the former, seems unknown.

Of the genus Hydra there are two well-distinguished species: *H. fusca* and *H. viridis*. Both abound in fresh waters of small lakes, ponds, and sluggish streams, associated with various aquatic plants, notably Lemna, various algæ, pond lilies, etc.

II. Hydrocorallinæ.

Colonial. Hydrosome comprising polyps of two forms, gastrozoids and dactylozoids, supported from a network of cœnosarcal hydrorhizæ, from the ectoderm of which is secreted a calcareous mass which is deposited over the spaces or meshes of the network. The colonies form incrusting, often arborescent, masses over shells, stems of Alcyonaria, or other support, often forming massive and fantastic shapes, as in the so-called "stag's horn coral." Only one genus is likely to come within the range of the present synopsis, namely, Millepora; and of this a single species, alcicornis.

III. Tubulariæ (Gymnoblastea).

The Tubulariæ are for the most part colonial hydroids, producing free medusæ, or medusoid gonophores, by budding. Hydroids devoid of

[1] Just as these notes were being put into final form for the press, I have been permitted to consult the manuscript of a forthcoming *Handbook of the Hydroida of the Woods Hole Region*, by Professor C. C. Nutting, for the privilege of which I am under grateful obligations.

hydrothecæ and gonangia. Sexual individuals when set free are known as Anthomedusæ. Medusæ ocellate, *i.e.*, the sensory bodies, are visual in character, and are located usually at the bases of the tentacles. Gonads borne in the tissues of the manubrium.

IV. CAMPANULARIÆ (Calyptoblastea).

Hydroids with hydrothecæ and gonangia. Colonial; propagating by budding both in development of hydrosome and in formation of gonosomes, the latter of which may become free as medusæ, or only partially develop as medusoids, with only rudimentary medusan organs. Medusæ with sensory organs of the vesiculate type, otocysts, borne upon the margin of the bell, usually between bases of tentacles. Gonads borne under the radial canals. Medusæ when free are Leptomedusæ.

V. TRACHOMEDUSÆ.

Hydromedusæ devoid of hydrosome (hypogenic), medusa developing directly from the egg; no alternation of generations known. Sensory organs chiefly tentaculocysts, containing endodermal otoliths. Gonads borne under radial canals. Medusæ generally somewhat hemispherical in shape, with thick mesoglœa. Radial canals, four, six, or eight, often centripetal.

VI. NARCOMEDUSÆ.

Hydromedusæ devoid of hydrosome (hypogenic), development of medusa being direct with no alternation of generations. Medusa rather flat in shape, and with radial canals in form of broad gastric pouches, which vary in number, as do also the tentacles, which are usually set at some distance up on the outer surface of the umbrella.

VII. SIPHONOPHORA.

Hydromedusæ with free-swimming, polymorphic colonies, produced by differential budding. The colonies of this order are characterized by an extreme specialization of the several types of individuals which comprise them. Reproductive products borne in gonophores which seldom become free.

KEY TO FAMILIES OF TUBULARIÆ.

Hydranth devoid of specialized receptacles, hydrothecæ. Sexual products not borne in closed gonangia.

1. Hydranths with scattered, filiform tentacles . . . . CLAVIDÆ, 1
2. Hydranths with single whorl of filiform tentacles:
   a. Hypostome conical, not abruptly differentiated.
      b. Colony regularly branched . . . . . BOUGAINVILLIDÆ, 3

b'. Colony not branched. Hydrorhiza of anastomosing canals, forming an incrusting base, overlaid with ectodermal cœnosarc.

c. Hydranths with sessile, fixed gonophores . HYDRACTINIDÆ, 5

c'. Hydranths producing free medusæ . . . PODOCORYNIDÆ, 6

a'. Hypostome trumpet-shaped or hemispherical . . EUDENDRIDÆ, 4

3. Hydranths with more than a single whorl of filiform tentacles :

a. Stem provided with definite sheath of horny perisarc.

b. Distal tentacles in two whorls . . . . . HYBOCODONIDÆ, 10

b'. Distal tentacles not in two whorls . . . . . TUBULARIDÆ, 9

a'. Stem not provided with definite sheath of perisarc, more or less definitely marked with longitudinal flutings or cœnosarcal channels CORYMORPHIDÆ, 8

4. Hydranths with scattered, somewhat spirally disposed, capitate tentacles only . . . . . CORYNIDÆ, 2

5. Hydranths with proximal circle of filiform tentacles, and with distal capitate tentacles on hypostome . . . . . PENNARIDÆ, 7

1. CLAVIDÆ.

Colonial, stems simple or branching, hydranths elongate, clavate, with numerous filiform tentacles irregularly disposed over the body. Gonophores borne upon hydranth, or on special branches, or occasionally arising from the hydrorhiza. Medusoids never free.

GENERA.

1. CLAVA. Colony of simple, unbranched individuals, devoid of perisarc, except near the base.

2. RHIZOGETON. Colony very similar to Clava. Gonophores arising from hydrorhiza.

3. CORDYLOPHORA. Colony profusely branched and with definite sheath of perisarc.

Clava leptostyla Ag.

Trophosome : Hydranths simple, with slender basal portion which arises from a filiform hydrorhiza protected by a delicate perisarcal covering, which extends slightly upon the bases of the polyps. Tentacles numerous, filiform, and scattered over the hydranth.

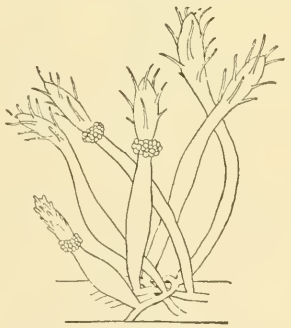

FIG. 1.— *Clava leptostyla* Ag. (Adapted from Allman.)

Gonosome : Gonophores in clusters at base of tentacles, medusoids never becoming free. Male gonads of a bright pinkish hue, similar, in general, to that of the colony. Female gonads of a rather distinctly purple color.

Habitat : Shallower waters on fucus, docks, sea wall, etc., at Cold Spring Harbor, Woods Holl, Hadley Harbor, etc.

Rhizogeton fusiformis Ag.

(*Contr. Nat. Hist. U. S.*, vol. iv.)

Trophosome: Colony much as in Clava. Hydranths of about ¼ inch in height, tentacles about twelve in number, borne on distal half of polyp.

Gonosome: Gonophores oval, arising from hydrorhiza on short peduncles, the whole invested by filmy perisarc.

Habitat: Rocky pools between tide marks, Massachusetts Bay.

Cordylophora lacustris Allman.

Trophosome: Colonial, profusely branching, hydranths with scattered filiform tentacles.

Gonosome: Gonophores borne on branches, ovate and with definite investment of perisarc.

Habitat: Brackish, and fresh waters in lagoons, ponds, etc.

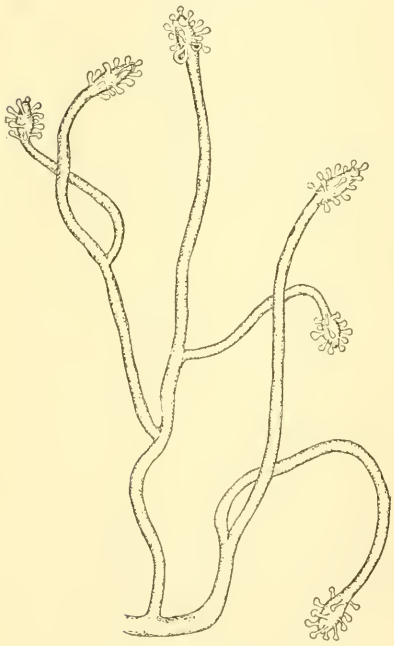

FIG. 2.—*Syncoryne mirabilis* Ag. (After Agassiz.)

2. CORYNIDÆ.

Colonial, hydranths with capitate tentacles only, scattered over the elongated bodies, or growing in indefinite whorls. Gonophores usually borne among the proximal tentacles, or from body of polyp and producing medusæ, which may become free or remain attached.

GENERA.

1. SYNCORYNE. Stem invested by definite perisarc; hydranths claviform.

2. CORYNITIS. Stem devoid of definite perisarc; hydranths sessile, with long, cylindrical bodies.

Syncoryne mirabilis Ag.

Trophosome: Branched, perisarc smooth or with only slight indication of annulations. Hydranths with numerous capitate tentacles.

Gonosome: Medusæ borne on hydranth body. These are of two forms, one free and developing earlier, hemispherical, with well-developed tentacles, with an ocellus at their base; the other fixed, tentacles rudimentary, and devoid of ocelli.

Corynitis agassizii McCr.

Trophosome: Colonial, not branched, hydranths with cylindrical, highly contractile bodies, and spirally arranged, capitate tentacles.

Gonosome: Gonophores growing low on body of hydranth or among the proximal tentacles. Medusæ almost spherical, the surface dotted with clusters of nematocysts. Marginal tentacles two or four, nodulated and swollen with batteries of nematocysts.

Habitat: Shells of Mytilis, usually overgrown with incrustations of Membranopora.

3. Bougainvillidæ.

Colonial, branching, with distinct perisarc. Hydranths with conical hypostome and a single whorl of filiform tentacles. Gonophores borne just below the hydranth. Medusæ with four radial canals, marginal tentacles either single or in clusters, and with ocelli at their bases.

GENERA.

1. Bougainvillia. Hydrocaulus with dense perisarc. Medusæ with clustered marginal tentacles and with branching oral tentacles.

2. Perigonimus. Stems with gelatinous perisarc. Medusæ with two marginal tentacles and without oral tentacles.

Bougainvillia superciliaris Ag.

Trophosome: Colony attaining a height of about two inches. Stem irregularly branched, branches annulated proximally. Hydranths with inconspicuous hypostome and from fifteen to twenty tentacles.

Fig. 3.—*Bougainvillia superciliaris* Ag. (After Agassiz.)

Gonosome: Gonophores borne mostly on pedicels from ultimate branches. Mature medusæ with heavy manubrium and branched tentacles, those of margin arising from conspicuous sensory bulbs. Colony light color with greenish tinge, hydranth light rose tint. Medusæ with yellowish manubrium tipped with red, sensory bulbs reddish orange.

Bougainvillia (*Margelis*) *carolinensis* McCr.

Trophosome: Colony sometimes eight to twelve inches high, usually much smaller. Stem profusely branching, with hydranths freely distributed on both stem and branches, and of elongate and flexible, subconical form. Tentacles about twelve.

Gonosome: Gonads borne on both stem and branches, often in clusters.

Medusæ much as in previous species, but with narrower and shorter hypostome. Colony light grayish tinged with dull green, hydranths with reddish tint. Medusæ with brick-red manubrium and sensory bulbs, ocelli black.

Habitat: Piles of docks, occasionally on seaweed and floating timbers.

Perigonimus.

Colonial, rarely attaining a height of more than ½ of an inch, simple or branched, perisarc usually gelatinous and extending to base of tentacles. Hydranths relatively large and with conical hypostome. Medusæ borne on hydranths or on stem or branches. bell-shaped and with two to four tentacles with bulbous bases.

Perigonimus jonesii.

(*American Naturalist*, vol. xxviii, p. 27.)

Trophosome: Colonial, branching freely, with thick, gelatinous perisarc, often wrinkled, extending to, or even including, the bases of tentacles. Hydranths with subconical hypostome, with about sixteen filiform tentacles, alternately elevated and depressed.

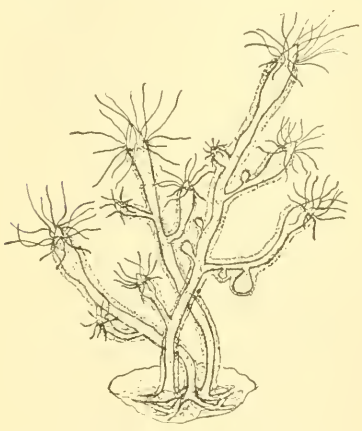

FIG. 4.—*Perigonimus jonesii.*

Gonosome: Medusæ ovoid or hemispherical, with four radial canals and ocelli, but having only two tentacles, which are often spirally coiled and disposed within the subumbrellar cavity.

Habitat: Found only upon the abdomen and legs of the spider crab, *Labinia marginata*, Cold Spring Harbor, L. I.

4. EUDENDRIDÆ.

Colonial, often branching with great profusion, becoming quite arborescent. Perisarc distinct, more or less annulated, attached by creeping hydrorhiza. Hydranths flask-shaped, with sharply differentiated, trumpet-shaped hypostome. Tentacles filiform, forming a single whorl about the base of the hydranth. Male gonophores borne in a verticil just beneath the tentacles of hydranth, which in some species become directly metamorphosed into gonophores. Female gonophores not verticillate, usually borne on body of hydranth, which often becomes transformed into gonophores with their peculiar spadiceous, finger-like coils enclosing the ova. The family includes a single genus, Eudendrium, fairly characterized in the accompanying cut. The following species are designated:

Eudendrium ramosum Linn.

Trophosome: Colony arborescent, much branched, attaining a height of from four to six inches. Branches rather symmetrical, pinnate and somewhat alternate, with similar sub-branches. Hydranths somewhat ovoid, with trumpet-shaped hypostome, and with single verticil of about twenty tentacles, some of which are often atrophied in male.

Gonosome: Sexes distinct, though often growing in approximate colonies. Gonophores of female somewhat pyriform and scattered, springing from body of hydranth or occasionally directly from stem. Male gonophores spring from base of hydranth close beneath the tentacles in moniliform clusters, each from three to four chambered. Color of male reddish, of female orange. Abundant on piles of docks, on racks, etc., in shallower waters.

FIG. 5.
Eudendrium ramosum Linn.
(After Allman.)

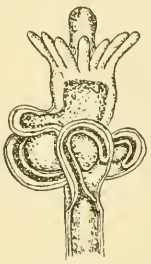

FIG. 6.

FIG. 5. — Colony.
FIG. 6. — Hydranth with gonophores.

Eudendrium dispar Ag.

(*Cont. Nat. Hist. U. S.*, vol. iv.)

Trophosome: Colony large, from three to five inches in height, stems more slender than in former, somewhat fascicled, extensively and variously branched and annulated. Hydranths vasiform, with about twenty-eight tentacles.

Gonosome: Sexes distinct. Gonophores of female of pinkish orange hue, variously clustered about the base of the more or less atrophied hydranth and from distal portion of stem. Habitat in deeper waters in Vineyard Sound, attached to rocks, shells, etc.

Eudendrium tenue A. Ag.

(*No. Am. Acalephæ*, p. 160.)

Trophosome: Colony very small, rarely exceeding an inch in height, branching irregularly, hydranths vasiform, borne on slender pedicels.

Gonosome: Male gonophores from two to four chambered, of pinkish color, clustered from bases of tentacles. Female gonophores bright orange in color, scattered over the branches and stem. Habitat on seaweed, etc., in shallower waters. Not abundant.

Eudendrium capillare Alder.

Of the distinctness of this species and *E. album*, listed by Professor Nutting, I have grave doubts. It seems to me that Alder's diagnosis of capillare coincides so closely with that of *E. tenue* as to render their identity highly probable. So also of *E. album*. Specimens taken at Woods Holl seem almost certainly identical with *E. tenue*, and therefore both should probably be merged under *E. capillare*, whatever slight differences there are being hardly greater than varied environment would easily explain.

5. HYDRACTINIDÆ.

The Hydractinidæ are so closely allied to the following family that it seems unfortunate that they were not originally merged: the only easily distinguishable difference being in the free medusæ of the latter in contrast with the fixed sporosacs of the former. In size, general habit, and morphology they are so closely identical that but for the gonosomes no difference would be recognizable, though in Podocoryne the hydrorhiza seems less definitely covered with naked cœnosarc, — but even this differs greatly in specimens from different localities.

In both polymorphism is a marked feature, at least three types of polyps being distinguishable:

1. Feeding hydranths (trophopolyps), whitish in color and with numerous filiform tentacles, frequently appearing in alternately elevated and depressed order.

2. Reproductive individuals (gonopolyps), more slender-bearing gonophores in clusters below the tentacles, which are fewer in number than in the first and imperfectly developed.

3. Spiral polyps, elongated individuals, wholly devoid of tentacles and with apex of body thickly beset with nematocysts.

The entire colony arises from an incrusting base which is thickly beset with jagged spines, the latter sometimes considered a fourth type of individual.

FIG. 7. — *Hydractinia echinata*. (Adapted from Hincks.)

Hydractinia echinata Fleming.

(Hydractinia polyclina Ag., *Cont. Nat. Hist. U. S.*)

Trophosome: Colony composed of numerous polyps, as given above.

Gonosome: Gonads as sessile sporosacs borne on distinct hydranths, gonopolyps, having but few tentacles. Medusoids never free.

Habitat: Usually found upon shells occupied by the hermit crab, but occasionally found upon fucus and occasionally also upon piles of docks.

6. Podocorynidæ.

Colony very similar to that of the Hydractinidæ, as given above. Hydranths with single whorl of filiform tentacles surrounding base of the conical hypostome.

Podocoryne carnea Sars.

Trophosome: Hydranths slender, pinkish-white in color, and with filiform tentacles.

Gonosome: Medusæ borne in clusters about the hydranth just below the whorl of tentacles. When set free the medusa is of marked bell-shape, with definite velum, short manubrium of reddish color, four radial canals from the bases of which arise eight marginal tentacles.

Habitat as in Hydractinia.

Stylactis.

Under this generic name Sigerfoos describes (*American Naturalist*, Vol. XXXIII) a hydroid having many points in common with the Podocorynidæ, and it should probably be classed under this family. He has given to it the specific name Hooperi (*cf. op. cit.*). The following definitive characters have been given of it:

Trophosome: Hydranths slender, with a length when fully expanded of about ¾ of an inch. Tentacles in single whorl, filiform, and of variable number, eighteen to twenty-five.

Gonosome: Gonophores borne upon specialized hydranths just below tentacles, and set free as medusæ having four radial canals, eight tentacles which are somewhat rudimentary, devoid of ocelli. Sexual products borne upon manubrium. Found on shells of *Stygnassa* (Illyanassa) *obsoleta*.

7. Pennaridæ.

Colony arborescent, pinnately branched, hydranths with two sets of tentacles, one proximal composed of ten to twelve, filiform, the other borne upon hypostome in two indefinite whorls, short and capitate.

Pennaria tiarella McCrady.

Trophosome: Colony attaining a height of from five to six inches, usually smaller in colonies attached to eelgrass or seaweed. Regularly branching, stem somewhat undulating, or geniculate in young colonies, regularly annulated just above branches, as are also the latter at point of origin. Hydranths large and flask-shaped, those terminating stem or branches appreciably larger than others.

Gonosome: Medusæ borne on hydranth body above the whorl of proximal tentacles. Medusæ liberated during early evening and discharging the sex products immediately thereafter. In many cases the ova are discharged before the liberation of the medusæ, as indeed are also the sperms.

Habitat: Abundant on piles of docks, floating timber, eelgrass, fucus, etc., usually in shallower waters. Development from June to October.

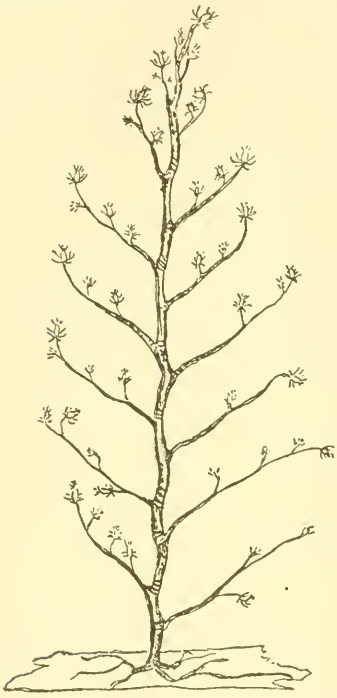

FIG. 8.

8. CORYMORPHIDÆ.

Usually solitary, though I have occasionally found definite colonial

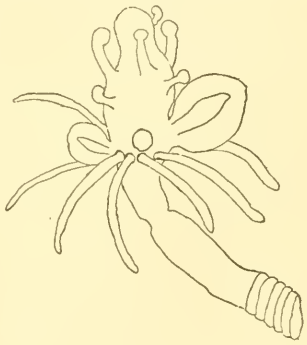

FIG. 9.

FIG. 8. — *Pennaria tiarella* McCr.
FIG. 9. — Hydranth enlarged, showing origin of medusæ.

buds arising direct from the hydrorhiza. Hydranths with proximal and distal whorls of filiform tentacles. Gonophores as free medusæ with four radial canals and with one to four marginal tentacles, one of which is usually much the larger.

Corymorpha pendula Ag.

(*Cont. Nat. Hist. U. S.*, vol. iv.)

Trophosome: Hydrocaulus from two to four inches in height, the fleshy cœnosarc traversed by longitudinal canals which ramify more or less near the base. Hydrorhiza an indefinite root-like expansion of the base, by which the whole is attached to the sandy substratum.

Hydranths flask-shaped, sharply distinct from stem. Proximal tentacles large, forming a single whorl at base of hydranth. Distal tentacles very contractile, forming alternating verticils about the base of the hypostome.

Gonosome: Medusæ borne on branched peduncles, arising just above the proximal tentacles, ovoid hemispherical, with single large and usually three rudimentary tentacles.

Hydroid bright pink in color, medusæ light yellowish, manubrium, tentacles, and bulbs pinkish.

Habitat: Sandy bottom in rather deep waters at various points in Vineyard Sound, Muskegat Channel, etc.

FIG. 10. — *Corymorpha pendula* Ag. (Modified from Allman.)

9. TUBULARIDÆ.

Hydrocaulus with definite perisarc, simple or irregularly branched. Hydranths flask-shaped, with proximal and distal whorls of filiform tentacles. Gonophores in form of fixed sporosacs, borne on branched peduncles.

Tubularia.

Generic description as given for family. The following species are given:

Tubularia couthouyi Ag.

(*Cont. Nat. Hist. U. S.*, vol. iv.)

Trophosome: Stems unbranched, attaining a height of from four to six inches. Hydranths large, often expanding an inch or more in diameter, with proximal whorl of thirty to forty filiform tentacles and a distal one of much smaller.

Gonosome: Gonophores as numerous, densely crowded racemes of pendulous sporosacs. Larvæ escaping as actinulæ. Hydranth and gonads bright pinkish red.

Habitat: On sandy bottoms dredged off Nobska Point, Vineyard Sound, and other similar places in the same locality.

Tubularia larynx Ellis and Solander.

Trophosome: Stems clustered, more or less branched, annulated. Height one to two inches. Stem forming a collar-like expansion just below hydranth, the latter bearing sixteen to twenty proximal filiform tentacles and a distal whorl of about the same number.

Gonosome: Gonads in pendulous clusters, similar to last. Color of hydranth and gonads rosy. Perisarc yellowish.

Tubularia spectabilis Ag.

(*Thamnocnidia spectabilis* Ag., *Cont. Nat. Hist. U. S.*)

Trophosome: Colony irregularly branched and sparsely annulated. Height three to four inches. Hydranths much as in former.

Gonosome: Comparable with former.

Tubularia tenella Ag.

(*Thamnocnidia tenella* Ag.)

Trophosome: Colony very small, rarely exceeding a height of one and one-half inches. Stem loosely branched and with indefinite annulations. Hydranths with tentacles about as in former.

Gonosome: Compare *T. larynx*. Color and habitat much as in last.

FIG. 11. — *Tubularia tenella* Ag.

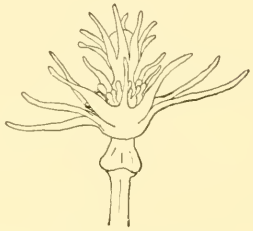

FIG. 12. — Single hydranth enlarged. (After Agassiz.)

FIG. 13. — *Tubularia crocea* Ag.

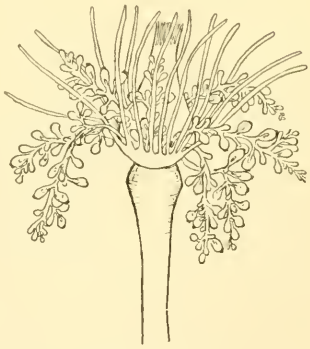

FIG. 14. — Hydranth with pendulous gonophores.

Tubularia crocea Ag.

(Parypha crocea Ag.)

Trophosome: Colonies growing in dense tufts of tangled stems of from three to four inches in height. Stems sparingly branched, with occasional indications of annulations. Hydranths with tentacles much as in former species, but numbering from twenty to twenty-four in each whorl.

Gonosome: Much as in the first species. Hydranths and gonads of rosy-red color, stem pale, whitish. Habitat. Growing in dense masses on piles of docks, floating timbers in harbors, and shallower waters.

Hypolitis perigrinus Murbach.

Under this name Murbach describes a hydroid taken at Woods Holl (*Quar. Journ. Mic. Sci.*, Vol. XLII), which would seem to have some affinities with the Tubularidæ. The following characters are summarized:

Trophosome: Colony consisting of simple hydranths with long hypostome and with distal and proximal whorls of filiform tentacles. Polyp free.

Gonosome: Gonads borne on hypostome just above proximal tentacles and occur singly in the type specimen. Sessile medusoids, somewhat terete in form and devoid of tentacular processes.

Fig. 15. — *Hybocodon prolifer* Ag. (After Agassiz.)

10. Hybocodonidæ.

Hydrocaulus unbranched, solitary, with definite perisarc and hydrorhiza. Hydranths large, with proximal and two distal whorls of filiform tentacles.

Hybocodon prolifer Ag.

(*Cont. Nat. Hist. U. S.*, vol. iv.)

Trophosome: Stems longitudinally striated, occasioned by cœnosarcal canals. Perisarc enlarged and annulated just below hydranth. Hydranth similar to those of the Tubularidæ, but with oral tentacles in two distinct whorls.

Gonosome: Gonophores closely attached to hydranth body just above proximal tentacles. Free medusæ with four radial canals, and with a single greatly enlarged tentacle from whose base a number of secondary medusæ successively bud, and from these still other groups of similar medusæ may arise.

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