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HYDROIDS OF EASTERN CANADA.

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INTRODUCTION.

Since the early days of the Geological Survey explorations, lists of hydroids have appeared in connection with those of other invertebrata. As in these instances the hydroids that appeared accidentally in the general collection were examined in connection with this general material or sent away for examination, there were seldom many species in the list. Verrill identified many of the species and collected in the Bay of Fundy and the gulf of St. Lawrence and his reports, although somewhat scattered were the most valuable previous to 1901, when Whiteaves, in his "Catalogue of the Marine Invertebrata of Eastern Canada," gave a comprehensive list including all the species that had been reported to that time. Since 1901 two lists have been published; the one by Stafford, in his "Fauna of the Atlantic Coast," which appeared in "Contributions to Canadian Biology," 1912, and the other my own list of the "Hydroids of Nova Scotia" in 1913. Certain references have also been made to Eastern Canadian distribution in the second and third parts of Nutting's monograph, published in 1904 and 1915, respectively.

In the meantime, collecting has been continued in connection with the Atlantic station, now at St. Andrews, N.B. The material accumulated was sent to me by Dr. A. G. Huntsman, with the request that I make an examination of it. It was of much interest to find it a most comprehensive collection, as shown by the fact that from it 79 species have been determined, while Whiteaves' list included but 58. Stafford's 69, six of which have neither name nor description, and my Nova Scotia list 50.

In some instances there is some doubt as to the validity of certain species. Stimpson named some species without giving figure or adequate description and A. Agassiz did the same. Some of these difficulties were straightened out by contemporaries, but with others there is still some confusion. Taking all together, 112 species have been determined with reasonable assurance, although in two or three cases, mentioned in the text, there is still some possibility of synonymy. The six unnamed species of Stafford's are not included in this number. In listing the hydroids in this latest collection, it is as well to include all, to bring the whole list from the eastern coasts of Canada to date.

Some Newfoundland locations are given but these are all on the gulf of St. Lawrence side. No attempt has been made to include the species reported north of the strait of Belle Isle.

Of the 112 species, 16 are reported for the first time in this area, but only one of these, *Bimeria brevis*, is described as new to science. The others are: *Dicoryne conferta*, *Garveia grœnlandica*, *Eudendrium album*, *Eudendrium annulatum*, *Tubularia spectabilis*, *Campanularia gigantea*, *Clytia cylindrica*, *Clytia edwardsi*, *Obelia articulata*, *Opercularella pumila*, *Stegopoma plicatile*, *Hebella pocillum*, *Sertularia cornicina*, *Antennularia americana*, *Plumularia setaceoides*.

The purpose of the paper is to give a complete list of species of hydroids that have been reported from the waters along the eastern coasts of Canada, with the distribution of each in this area, to give a synonymy which will include that given with the original description and one or more others where good descriptions or figures appear and all the references in connection with points in this area and to give an account of any new or important point noted.

GEOGRAPHIC DISTRIBUTION.

For the consideration of the question of distribution, the waters of Eastern Canada can be conveniently divided into three regions: (1) The Bay of Fundy and its approaches, (2) the Gulf of St. Lawrence, (3) the east or southeast coast of Nova Scotia.

In the Bay of Fundy the waters around the island of Grand Manan have been much used as a collecting ground ever since Stimpson found a sufficient number of species to make it worth while to write up "The Marine Invertebrates of Grand Manan." Then, as now, it was recognized that on account of the exposed position and the difference in tides, the channels between the numerous small islands must be continually supplied with enough food for countless forms of great variety. The archipelago between Passamaquoddy bay and the Bay of Fundy proper provides a large area where the conditions are somewhat similar although the salinity becomes noticeably less in the inner waters. The whole area is suitable for hydroid growth. Even at the mouth of the St. Croix river there is a sufficient interchange on account of the high tides to permit of the existence of some species. Most of the collecting has been done in shallow water and near shore, hence although 87 species have been obtained, the probability is that many others exist in areas as yet untouched.

Apart from the Passamaquoddy archipelago, one other point must be mentioned and this at the other side of the Bay of Fundy. St. Mary bay, near Brier island, Nova Scotia, must be a very satisfactory locality for hydroids. All the material sent from there, apparently was obtained during one trip, July 29-30, 1913, and yet from this material alone 30 species of hydroids were obtained. When that many were picked up in indiscriminate collecting, the locality must offer fine opportunities for one looking especially for hydroids.

The Gulf of St. Lawrence has been touched at only a few points, Malpeque, Gaspé, Seven islands, Anticosti, Bay of Islands, Newfoundland, and some individual dredging trips. It is quite possible that in the gulf there is no single restricted area that offers such a variety of conditions as that at the entrance to Passamaquoddy bay, yet along the whole coast there is variety in plenty and in the vast area of the gulf itself there are great differences in depth and in the nature of the bottom. While the 65 species already obtained may be representative, they must only serve as a sample of what is to be found there.

What is true of the Gulf of St. Lawrence is equally true of the Nova Scotia coast. The near shore waters have been touched only in the vicinity of Canso at the extreme east and at Barrington passage at the extreme south. The coast waters intervening are studded with small islands among which are innumerable channels with suitable conditions for a good food supply, in which no collecting has ever been done. The small amount of deep water dredging done by the United States Fish Commission gives some idea of the richness of the fauna in deep water. Of the 65 species from this area, five were found on sargassum from the gulf stream. These were *Syncoryne mirabilis*, *Olytia noliformis*, *Obelia hyalina*, *Sertularia cornicina* and *Plumularia setaceoides*, but the first two have also been reported from inshore.

In making a comparison of the hydroids found in these three areas, it will be noticed that of the 27 gymnoblasic species 25 have been found in the Bay of Fundy, 11 in the Gulf of St. Lawrence, and 15 off the Nova Scotia coast. The gymnoblasic forms are always an uncertain quantity, particularly in general collecting. So many of them are so delicate that they are soon past recognition unless they are preserved when taken from the water. It is quite possible, therefore, that the Bay of Fundy predominance is due to better preservation of material. Of the 26 species of Campanularians, 21 were found in the Bay of Fundy, 17 from the Gulf of St. Lawrence and 17 from the Nova Scotia coast, almost exactly the same proportion as the whole number of species. Of the 7 species of the Campanulinidæ, 3 were found in the Bay

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of Fundy, 5 in the Gulf of St. Lawrence, and 2 off the Nova Scotia coast. These are small forms and easily overlooked. Of the 9 species of the Halecidae, 8 were from the Bay of Fundy, 7 from the Gulf of St. Lawrence, and 4 from the Nova Scotia coast. There is no apparent reason why the Nova Scotia coast should be lacking but there is a similar lack in the Gulf of St. Lawrence in the Lafœidae and Hebellidae as out of the 11 species recorded, there are 7 from the Bay of Fundy, 3 from the Gulf of St. Lawrence and 9 from the Nova Scotia coast. In the Sertularidae the gulf of St. Lawrence leads, as out of the 24 species, 19 are from the Bay of Fundy, 21 from the Gulf of St. Lawrence, and 14 from the Nova Scotia coast. As usual in temperate regions, the Plumularidae are poorly represented. Out of the 8 species reported, 4 are from the Bay of Fundy, 1 from the Gulf of St. Lawrence and 4 from the Nova Scotia coast, only one species being reported from more than one place. Taking the coast as a whole, the gymnoblastic species and the Campanularidae are well represented while the Halecidae and the Sertularidae are proportionately low in numbers.

With the distribution here recorded additional evidence is obtained regarding the conclusion that, for a large number of species, the distribution takes place southward along the continental shores from a central circumpolar area. Of the 112 species, 65 have been reported from the Arctic regions, 72 from the west of Europe, and 57 from the west coast of North America. Furthermore, it indicates that along these coasts there is no very definite break in the continuity at any one point, although, of course, some of them extend farther southward than others. Of the 77 species that have been reported from the east coast of the United States as well, 62 of them or 80 per cent occur in the Arctic regions, Western Europe, or the west coast of North America, and 21 of them appear in the list of 51 species obtained at Beaufort, N.C., in 1911.

A table shows the distribution of each species in these regions and another shows the distribution of the Gymnoblaster and the main families of the Calyptoblastea.

DISTRIBUTION TABLE FOR SPECIES.

	Bay of Fundy.	Gulf of St. Lawrence.	Atlantic Coast of Nova Scotia.	East Coast of United States.	Arctic regions.	West Coast of Europe.	Pacific Coast of North America.
<i>Cordylophora lacustris</i>	x	x		x		x	
<i>Clava leptostyla</i>	x	x	x	x		x	x
<i>Monobrachium parasitum</i>		x			x		x
<i>Syncoryne mirabilis</i>	x	x	x	x	x		x
<i>Dicoryne conferta</i>	x					x	
<i>flexuosa</i>	x		x				
<i>Bimeria brevis</i>	x						
<i>Garveia greenlandica</i>		x			x		x
<i>Bougainvillia carolinensis</i>	x	x	x	x			
<i>Eudendrium album</i>	x			x			
<i>annulatum</i>	x				x	x	
<i>capillare</i>	x		x	x	x	x	x
<i>cingulatum</i>	x						
<i>dispar</i>	x	x	x	x			
<i>rameum</i>	x		x		x		x
<i>ramosum</i>	x	x	x	x		x	x
<i>tenuis</i>	x		x	x			
<i>Hydractinia echinata</i>	x	x	x	x	x	x	
<i>Myriothele phrygia</i>	x				x	x	
<i>Acaulis primarius</i>	x			x	x		
<i>Corymorpha pendula</i>	x	x	x	x			
<i>Tubularia couthouyi</i>	x			x			
<i>crocea</i>	x		x	x			x
<i>indivisa</i>	x		x		x	x	x
<i>larynx</i>	x	x	x	x	x	x	x
<i>spectabilis</i>	x			x			
<i>tenella</i>	x		x	x			
<i>Campanularia amphora</i>	x		x	x			
<i>flexuosa</i>	x	x	x	x	x	x	
<i>gelatinosa</i>		x		x	x	x	x
<i>gigantea</i>	x	x		x		x	
<i>greenlandica</i>	x		x		x	x	x
<i>hineksi</i>			x	x	x	x	x
<i>integra</i>	x	x		x	x	x	x
<i>magnifica</i>			x				
<i>neglecta</i>	x	x	x	x		x	
<i>speciosa</i>		x			x		x
<i>verticillata</i>	x	x	x	x	x	x	x
<i>volubilis</i>	x	x	x	x	x	x	x
<i>Clytia cylindrica</i>	x			x			x
<i>edwardsi</i>	x			x			x
<i>johnstoni</i>	x	x	x	x	x	x	x
<i>noliformis</i>	x	x	x	x			x
<i>Eucopella calcinata</i>	x	x	x	x	x	x	x
<i>Gonothyræa gracilis</i>	x		x	x	x	x	x
<i>loveni</i>	x	x	x	x	x	x	
<i>Obelia articulata</i>	x			x			
<i>commissuralis</i>	x	x	x	x			x
<i>dichotoma</i>	x	x	x	x	x	x	x
<i>fiabellata</i>	x	x		x	x	x	x
<i>geniculata</i>	x	x	x	x	x	x	x
<i>hyalina</i>			x	x		x	
<i>longissima</i>	x	x		x	x	x	x
<i>Calycella syringa</i>	x	x	x	x	x	x	x
<i>Cuspidella costata</i>		x		x		x	
<i>grandis</i>		x				x	x
<i>Opercularella lacerata</i>	x		x	x	x	x	x
<i>pumila</i>	x			x			
<i>Stegopoma plicatile</i>		x			x	x	x
<i>Tetrapoma quadridentatum</i>		x			x		
<i>Halecium articulatum</i>	x			x		x	x
<i>beani</i>	x	x	x	x	x	x	
<i>curvicaule</i>	x					x	x
<i>gracile</i>	x	x		x			
<i>halecinum</i>	x	x		x	x	x	x
<i>minutum</i>	x	x	x		x		
<i>muricatum</i>	x	x	x		x	x	x
<i>sessile</i>		x				x	
<i>tenellum</i>	x	x	x	x	x	x	x

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DISTRIBUTION TABLE FOR SPECIES—*Concluded.*

	Bay of Fundy.	Gulf of St. Lawrence.	Atlantic Coast of Nova Scotia.	East Coast of United States.	Arctic regions.	West Coast of Europe.	Pacific Coast of North America.
<i>Hebella calcarata</i>			x	x			
<i>pocillum</i>	x			x	x	x	x
<i>Cryptolaria triserialis</i>			x				
<i>Filellum serpens</i>	x		x	x	x	x	x
<i>Grammaria abietina</i>	x	x	x		x	x	x
<i>gracilis</i>	x						
<i>Lafcea dumosa</i>	x	x	x	x		x	x
<i>fruticosa</i>	x		x		x	x	x
<i>gracillima</i>	x	x	x	x	x	x	x
<i>pygmaea</i>			x			x	
<i>symmetrica</i>			x			x	
<i>Abietinaria abietina</i>	x	x	x	x	x	x	x
<i>filicula</i>	x	x		x	x	x	x
<i>Diphasia fallax</i>	x	x	x	x	x	x	
<i>rosacea</i>	x	x	x	x	x	x	
<i>tamarisca</i>	x		x		x	x	
<i>Hydrallmania falcata</i>	x	x	x	x	x	x	
<i>Selaginopsis mirabilis</i>		x	x	x	x		x
<i>Sertularella conica</i>			x	x			x
<i>fusiformis</i>		x				x	x
<i>polyzonias</i>	x	x	x	x	x	x	x
<i>rugosa</i>	x	x	x	x	x	x	x
<i>tricuspidata</i>	x	x	x	x	x	x	x
<i>Sertularia cornicina</i>			x	x			
<i>pumila</i>	x	x	x	x	x	x	x
<i>Thuiaria argentea</i>	x	x	x	x	x	x	x
<i>cupressina</i>	x	x	x	x	x	x	
<i>fabricii</i>	x	x		x	x	x	x
<i>immersa</i>	x	x			x		
<i>latiuscula</i>	x	x					
<i>lonchitis</i>	x	x	x	x	x	x	
<i>robusta</i>		x			x		x
<i>similis</i>	x	x					x
<i>tenera</i>	x	x			x	x	x
<i>thuja</i>	x	x		x	x	x	x
<i>Aglaophenopsis cornuta</i>			x		x		
<i>Antennularia americana</i>	x			x			
<i>antennina</i>	x			x	x	x	
<i>Cladocarpus pourtalesii</i>			x	x			
<i>speciosus</i>			x				
<i>Plumularia setaceoides</i>			x	x			
<i>Schizotricha gracillima</i>	x			x		x	
<i>Thecocarpus myriophyllum</i>	x	x		x		x	

SUMMARY OF DISTRIBUTION.

	Total.	Bay of Fundy.	Gulf of St. Lawrence.	Atlantic Coast of Nova Scotia.	East Coast of United States.	Arctic regions.	West Coast of Europe.	Pacific Coast of North America.
<i>Gymnoblastera</i>	27	25	11	15	17	11	12	10
<i>Campanularidae</i>	26	21	17	17	23	16	18	18
<i>Campanulinidae</i>	7	3	5	2	4	5	5	4
<i>Halecidae</i>	9	8	7	4	5	6	7	4
<i>Hebellidae</i> and <i>Lafceidae</i>	11	7	3	9	5	6	8	6
<i>Sertularidae</i>	24	19	21	14	17	19	18	15
<i>Plumularidae</i>	8	4	1	4	6	2	4	

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It is interesting to compare this list with the list of those that have been found in the Vancouver island region. Although this region is somewhat farther north than the Bay of Fundy or the greater part of the gulf of St. Lawrence, it is not subject to the same cold currents, hence the conditions are to some extent comparable.

In my 1914 paper, 136 species were listed and since then 4 more have been added to the list, making 140 in all. Of these 48 appear as well on the eastern Canadian list. On the west coast, of the families represented, the Sertularidæ is the most numerous, with 41 species, 29 per cent of the whole number, the Campanularidæ next with 34 or 24 per cent. The Gymnoblasteria is represented by 25 species, 18 per cent, and the Halecidæ with 16 or 11 per cent. This is not the order on the east coast. The gymnoblastic species are more numerous than the species of any calyptoblastic family, there being 27 or 24 per cent of the whole number. The Campanularidæ with 26 or 23 per cent beats the Sertularidæ with 24 or 21 per cent and the Halecidæ has only 9 representatives or 8 per cent. The Plumularidæ, a large family, is represented by only 8 species in each case, and as none of these are common there can scarcely be a circumpolar centre for this family. A table will show this comparison more readily:—

	Total.	Gym.	Campanularidæ.	Campanularidæ.	Halecidæ.	Hebelidæ and Lafoeidæ.	Sertularidæ.	Plumularidæ.
Eastern Canada.....	112	27	26	7	9	11	24	8
Vancouver Island region.....	140	25	34	8	16	8	41	8

SYSTEMATIC DISCUSSION.

With regard to nomenclature nothing need be said in connection with any of the families with the exception of the Sertularidæ. This family may well be considered on account of the treatment it has received in Levensen's paper of 1913.¹ It is true that in this paper he introduces no opinions that were not found in his paper of 1893², but he goes into a much more elaborate defence of these opinions and hence the latter paper has received much more attention than the former.

In the classification of the Sertularidæ, as given in these papers, Levensen casts all other characters aside and bases his entire taxonomic faith on the opercular apparatus as a basis for generic distinction. Naturally this throws the synonymy of the Sertularidæ, not by any means in a settled state, into greater confusion. Broch and Kramp have subscribed to his views but elsewhere they have found little favour when considered in their entirety although certain points have been accepted by a number of authors.

A lengthy discussion of the system, as expounded in the 1913 paper, will not be attempted here but a few general remarks on the soundness of the arguments deduced seems advisable.

The argument may be stated as follows: There are individual (zooidal) characters and colonial (zoarial) characters. In general the individual characters are better suited for taxonomy than colonial characters therefore all colonial characters should be excluded. Among the individual characters, some relate to the trophosome, some to the gonosome. Those relating to the trophosome are more suitable for taxonomy than those relating to the gonosome, therefore the gonosome characters should

¹ Systematic Studies in the Sertularidæ.

² Medusæ, Ctenophores and Hydroids of the West Coast of Greenland.

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be excluded. Among the individual trophosome characters the nature of the opercular apparatus is a good character, therefore all other characters should be excluded and the opercular apparatus must form the one and only basis for the whole system of classification.

Let us examine the argument piece by piece. In the first place, without trying to settle the relative value of individual and colonial characters, are the colonial characters of such little value that they should be neglected entirely in classification? In connection with this, Levinsen drew an analogy in his earlier paper (p. 184) and was so well satisfied with it that he quoted it in his later paper (p. 255). It is this: "A zoological system based on that kind of characters may be compared to a botanical, in which the chief stress was laid on the inflorescences and not on the structure of the flowers. In both cases, the genus would contain a number of heterogeneous species. It can hardly be deemed doubtful that constant differences in the structure of the single individuals in question, of the hydrothecæ or hydranths, ought to be preferred as systematic characters, and that colonial characters ought only to be used when structural diversities were not to be found."

The analogy is somewhat unfortunate as in many cases the inflorescence is characteristic not only for the genus but even for the family. What more constant character would it be possible to get than the head of the Compositæ, the loose raceme of the Ranunculaceæ or the compound umbel of the Umbelliferæ? In the great majority of cases each species has a typically characteristic habitus and whatever in addition may be used as a basis for first diagnosis, as soon as the plant becomes familiar, it will be recognized by its inflorescence rather than by any single characteristic of the flower itself. So too in the case of the hydroids, each species has its own typical habitus by which it is recognized and if the genus has not so much the worse for the genus or the validity of it. The fact that the habitus of the young colony may be somewhat different to that of the colony at a later period and depends to a certain extent on environment, rather increases than decreases the value of this as a distinctive character when the life history is known. In any case even if the colonial characters, taken as a whole, are not of so much value as the individual characters, there is no reason that they should be discarded.

Turning to the next part of the argument, the characters of the gonosome are neglected because they are less important than the characters of the trophosome. Are the characters of the gonosome of so little account? Turning again to the floral analogy, how much of any system of classification would be left if all the references to the nature of the gynœcium and andrœcium and their relations to other parts of the flower were left out? In all other families of hydroids the characters of the gonosome are used extensively for taxonomy, why should they not be used in the Sertularidæ?

Finally, going back to the floral analogy once more, is it possible to find a single family of plants of any size that is divided into genera on the basis of a single character of the floral envelopes? In the hydroids as well, although one character in a family may be prominent, it is seldom that the paucity of characters is so marked as to make it necessary to rely on one character of the trophosome alone as the determining factor throughout.

Some of the points as they appear in Levinsen's paper may well be considered. After showing that the different species of *Selaginopsis* do not fit in with the generic idea when based on the nature of the opercular apparatus, the following statement is made: "The fact that there is no constant relation between the structure of the zooids and the colonial form, or to express it in another way, that they are incommensurable values defined by different laws, must have the logical sequence, that one of them cannot be substituted for the other, and, therefore, a genus ought never to be instituted solely on the basis of a difference in the colonial form, when otherwise the zooids present distinct structural diversities" (p. 259). To state that the conclusion that "there is no constant relation between the structure of the zooids and the colonial form" is a

fact, upon such little basis, makes it necessary to materially discount any argument based on the statement. The resultant assertion depends for its value on the significance of the word "distinct." According to the remainder of the paper it might better have read "when otherwise the zooids present differences in the opercular apparatus" but with such an interpretation every other taxonomist will not necessarily agree. Some of them may even have the temerity still to believe that there may be some correlation between colonial and individual characters.

Levinsen entirely neglects the systematic value of the characters of the gonosome and hence in the genera in which he has introduced the most radical changes are to be found the widest diversity in these characters. In the genus *Sertularia* "the gonothecæ present a very different habitus, being either smooth, ringed or provided with two or more spines" (p. 298), and in the genus *Odontotheca* "the gonothecæ present a very variable habitus, being either smooth, ringed or provided with two spines" (p. 308). No system of classification based on colonial characters could present more "distinct structural diversities" than this.

With regard to the nature of the opercular apparatus almost anyone will admit that it is a good character, but even if it were the most suitable single character for diagnosis, it would not signify that the whole classification must depend on it, since there are other good characters. Levinsen says, "It seems reasonable to ascribe systematic significance also to the operculum, a structure that must be regarded as the complement of the protective cases, and, so to speak, as the end result of the same effort which led to the formation of the hydrothecæ and gonothecæ" (p. 288), and yet in this classification all of the hydrotheca with the exception of the opercular apparatus receives no consideration and the gonotheca is left out entirely. Farther on in the same paragraph he says the operculum "has in common with other structures of systematic significance, a rich development of characteristic modifications which give excellent generic characters," but in his classification he has eliminated the consideration of "other structures of systematic significance."

It seems a very satisfactory character in one respect as any cases of disagreement can be blamed on regeneration or injury but the very fact that regeneration is so very apt to take place and that the apparatus is so delicate as to be so susceptible to injury, makes its value for diagnosis of doubtful significance. After one has spent as much time and observation on the operculum as Levinsen did before writing this paper it might be possible to judge the nature of the operculum correctly from the appearance of the rest of the apparatus even when the operculum has been torn away but one with less experience will certainly have serious doubts at times when the operculum is not present and it is not always possible to have an unlimited supply of material to examine for hydrothecæ perfect in this respect. When Levinsen finds it necessary to disagree with the interpretation put upon the nature of the opercular apparatus by so many careful hydroid observers, e.g., with Nutting in the case of *Sertularia pumila*, it is evident that the adoption of a system based on such a character instead of bringing about a desirable degree of unanimity will tend to make the disagreement much more pronounced.

There can be little natural about a system of classification that makes it necessary to combine the genera *Abietinaria* and *Diphasia* into a single genus to make it fit in with the classification when the differences are so evident that they are immediately separated into the same two parts but called groups instead of genera for appearance, sake.

Levinsen objects to certain genera because there are intergrading forms but his classification leaves just as large a crop of these as is to be found in any other system. There will always be these intergrading forms but nothing is to be gained by crying down one system on this account when no improvement is made in a proposed substitute. When an attempt is made to fit in a system of classification of the Sertularidæ depending on the nature of the opercular apparatus with the general classifica-

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tion of the hydroids in use, we have, to use Levinsen's words, "incommensurables defined by different laws, so that we must have the logical sequence, that one of them cannot be substituted for the other."

While, therefore, the care with which Levinsen did this work on the opercular apparatus is fully recognized and while the value to systematists of this exhaustive examination is in no way under-estimated, it is impossible to do otherwise than conclude as many others have done, that although the nature of the opercular apparatus is a good character and is of much value in classification, it cannot be used satisfactorily as the sole basis on which to divide the Sertularidæ into genera. The time may come when there will be more general agreement on the method of classifying this family but it will be at a time when all the main variable features of each species will be taken into consideration.

As this paper is on distribution rather than on taxonomy, it is not desirable to discuss in detail this or any other system of classification. By adhering to the nomenclature used throughout in previous papers for the Sertularidæ as for the other families, there will at least be no difficulty in following the references to the various species considered.

Sub-order *GYMNOBLASTEÆ*.

Family *CLAVIDÆ*.

Genus *CORDYLOPHORA*.

CORDYLOPHORA LACUSTRIS Allman.

Cordylophora lacustris ALLMAN, Ann. and Mag. Nat. Hist., 1st ser. viii., 1844, p. 330.

HINCKS, Br. Hydroid Zoophytes, 1868, p. 16.

STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

Distribution.—St. Andrews, Gaspé, Seven islands (Stafford).

Although this is a fresh- or brackish-water form, since it has been reported it is well to include it in the list.

Genus *CLAVA*.

CLAVA LEPTOSTYLA Agassiz.

Clava multicornis STIMPSON, Marine Invert. Grand Manan, 1853, p. 16.

Clava leptostyla AGASSIZ, Cont. Nat. Hist. U.S., vol. iv, 1862, p. 218.

HINCKS, British Hydroid Zoophytes, 1868, p. 6.

NUTTING, Hyd. Woods Hole, 1901, p. 321.

HARGITT, Am. Nat. 1901, p. 305.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 18.

STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

FRASER, Hyd. Nova Scotia, 1913, p. 159.

Distribution.—Salmon Bay (Packard); Long island point to Labrador (Verrill); St. Andrews, Canso, Seven islands (Stafford); Canso (Fraser); St. Andrews.

Family *LARIDÆ*.

Genus *MONOBRACHIUM*.

MONOBRACHIUM PARASITUM *Mereschkowsky*.

Monobrachium parasitum MERESCHOWSKY, Hyd. from White Sea, 1877, p. 226.

LEVINSEN, Medusæ, Ctenophorer, etc., 1893, p. 151.

parasiticum BONNEVIE, Norske Nordhavs-Ex., 1899, p. 151.

parasitum STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Gaspé (Stafford).

Family *DICORYNIDÆ*.Genus *DICORYNE*.*DICORYNE CONFERTA* (Alder).

Eudendrium confertum ALDER, Trans. Tynes. Nat. F.C., iii, 1857, p. 103.

Dicoryne conferta HINCKS, Br. Hyd. Zooph., 1868, p. 105.

ALLMAN, Gymnoblasic Hyd., 1871, p. 293.

Distribution.—Off Minister's island.

DICORYNE FLEXUOSA G. O. Sars.

Dicoryne flexuosa SARS, Bidrag til Kundskaben om Norges Hydroider, 1873, p. 96.

VERRILL, Am. Jour. Sci. and Art, 3rd. ser., vol. xvi, 1878, p. 375.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 19.

STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

Distribution.—Off Nova Scotia, 50 to 125 fathoms (Verrill); St. Andrews (Stafford).

Family *SYNCORYNIDÆ*.Genus *SYNCORYNE*.*SYNCORYNE MIRABILIS* (Agassiz).

Coryne mirabilis AGASSIZ, Cont. Nat. Hist. U.S., vol. iv, 1862, p. 185.

Syncoryne mirabilis NUTTING, Hydroids of Woods Hole, 1901, p. 328.

HARGITT, Am. Nat., 1901, p. 328.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 19.

Dicoryne mirabilis STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

Distribution.—Belles Amours, strait of Belle Isle (Packard); bay of Fundy (Verrill); Seven islands (Stafford); Katy cove; on sargassum in the Gulf Stream east of Nova Scotia.

Family *BIMERIDÆ*.Genus *BIMERIA*.*BIMERIA BREVIS* new species.

(Fig. 2).

Trophosome.—Stem simple, growing from a creeping hydrorhiza; in many cases it forms a long pedicel for a single hydranth but in others it may give off several hydranths, each on a pedicel of its own, and occasionally these pedicels may be branched. The greatest length observed was 8 mm. In the branched specimens, the branches do not come off at regular intervals, either vertically or laterally; each makes quite an acute angle with the stem. The perisarc is quite thick and wrinkled but no definite annuli are formed; the portion around the body of the hydranth is closely wrinkled or creased; hydranth small with 11-12 tentacles.

Gonosome.—Absent.

Distribution.—On *Tubularia crocea* from Katy cove.

The habitus of this species is much similar to that of *Bimeria humilis* Allman³, but the stem is relatively much stouter, the hydranths are much smaller and the perisarc is much more wrinkled. In any case one should scarcely expect to find a species that was obtained in the warm, shallow water of the Tortugas to occur in the cold water of the bay of Fundy. It bears less resemblance to *Bimeria vestita* Wright as it is a shorter but coarser species.

³ Allman, G. J. Gulf Stream Hydroids, 1877, p. 9.

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Genus GARVEIA.

GARVEIA GRÆNLANDICA Levinsen.

Garveia grænlandica LEVINSEN, Meduser, Ctenophorer, etc., 1893, p. 155.
FRASER, Vancouver island hydroids, 1914, p. 117.

Distribution.—Bay of islands, Newfoundland, 50 to 60 fathoms.

Family BOUGAINVILLIDÆ.

Genus BOUGAINVILLIA.

BOUGAINVILLIA CAROLINENSIS (McCrary).

Hippocrene carolinensis MCCRADY, Gymno. of Charleston Har., 1857, p. 62.
Margelis carolinensis AGASSIZ, Cont. Nat. Hist. U.S., vol. iv, 1862, p. 344.
A. AGASSIZ, N. A. Acalephæ, 1865, p. 156.

Bougainvillia carolinensis NUTTING, Hyd. Woods Hole, 1901, p. 330.
STAFFORD, Fauna Atlantic Coast, 1912, p. 72.
FRASER, New England Hydroids, 1912, p. 41.
FRASER, Hyd. of Nova Scotia, 1913, p. 159.

Distribution.—St. Andrews, Seven islands (Stafford); Canso (Fraser); Katy cove, Joe's point.

The specimens of this species collected at Katy cove were small as compared with those described from Woods Hole. None of them were more than an inch in length but the medusa buds were well developed.

Family EUDENDRIDÆ.

Genus EUDENDRIUM.

EUDENDRIUM ALBUM Nutting.

Eudendrium album NUTTING, Ann. and Mag. Nat. Hist., 1898, p. 362.
Hyd. Woods Hole, 1901, p. 334.
HARGITT, Biol. Bull., 1908, p. 97.
FRASER, Hyd. of Beaufort, 1912, p. 348.

Distribution.—Off Deer point, Campobello island, and at many points between this and Dochet island up the St. Croix river, off Brier island, Nova Scotia, 33 to 39 fathoms.

EUDENDRIUM ANNULATUM Norman.

Eudendrium annulatum NORMAN, Ann. and Mag. Nat. Hist., 1864, p. 83.
HINCKS, Br. Hyd. Zooph., 1868, p. 83.
JÄDERHOLM, Northern and Arctic Invert., 1909, p. 51.

Distribution.—Brier island, 25 fathoms.

EUDENDRIUM CAPILLARE Alder.

Eudendrium capillare ALDER, Cat. Zooph. Northumberland and Durham, 1857, p. 15.
HINCKS, Br. Hyd. Zooph., 1868, p. 84.
ALLMAN, Gymno. Hyd. 1871, p. 335.
NUTTING, Woods Hole Hyd., 1901, p. 334.
WHITEAVES, Marine Invert. East Can., 1901, p. 20.
FRASER, Hyd. of Beaufort, 1912, p. 348.
STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

Distribution.—Le Have bank, 45 fathoms (Smith and Harger); St. Andrews (Stafford); Weir stakes at St. Andrew's island; off L'Etang head, 12 fathoms.

EUDENDRIUM CINGULATUM Stimpson.

Eudendrium cingulatum STIMPSON, Marine invert. Grand Manan, 1854, p. 9.

WHITEAVES, Marine Invert. East. Can., 1901, p. 20.

Distribution.—Off Duck Island, Grand Manan (Stimpson).

Stimpson's description of this species is very meagre but it seems to agree very well with that for *E. annulatum* Norman and very probably it is the same species. If it is the name *E. annulatum* should be retained as it has priority. A. Agassiz considered it to be the same as *Bougainvillia superciliaris* Agassiz (See N. A. Acalephæ, 1865, p. 153).

EUDENDRIUM DISPAR Agassiz.

Eudendrium dispar AGASSIZ, Cont. Nat. Hist. U.S., vol. iv, 1862, p. 285.

NUTTING, Hyd. Woods Hole, 1901, p. 332.

HARGITT, Am. Nat., 1901, p. 309.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 20.

STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

FRASER, Hyd. Nova Scotia, 1913, p. 160.

Distribution.—Vineyard sound to bay of Fundy (Verrill); St. Andrews, Seven islands (Stafford); Barrington passage (Fraser); Off Head Harbour Island, Off McMaster island, weir stakes, St. Andrews island, Joe's point, reef off St. Andrews, 10 fathoms.

EUDENDRIUM RAMEUM (Pallas).

Tubularia ramea PALLAS, Elench. Zooph., 1766, p. 83.

Eudendrium rameum HINCKS, Br. Hyd. Zooph., 1868, p. 80.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 19.

JÄDERHOLM, Northern and Arctic Invert., 1909, p. 50.

Distribution.—30 miles southeast of Halifax in 100 fathoms (Verrill); near Two islands, Grand Manan, 5-10 fathoms, off L'Etang head, off Joe's point, Weir stakes, St. Andrews island.

EUDENDRIUM RAMOSUM (Linnæus).

Tubularia ramosa LINNÆUS, Syst. Nat., 1758, p. 804.

Eudendrium ramosum HINCKS, Br. Hyd. Zooph., 1868, p. 82.

NUTTING, Hyd. Woods Hole, 1901, p. 332.

HARGITT, Am. Nat., 1901, p. 309.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 19.

STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

FRASER, Hyd. Nova Scotia, 1913, p. 160.

Distribution.—Bay of Fundy, 8 to 100 fathoms (Verrill); 8 miles southeast of Bonaventure island (Whiteaves); Métis and Murray bay (Dawson); St. Andrews, Gaspé, Seven islands (Stafford); Chedabucto bay, 45 fathoms (Fraser); many localities from Two islands to St. Andrews point, Brier island.

EUDENDRIUM TENUE A. Agassiz.

Eudendrium tenue A. AGASSIZ, N.A. Acalephæ, 1865, p. 160.

NUTTING, Hyd. Woods Hole, 1901, p. 333.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 20.

STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

FRASER, Hyd. Nova Scotia, 1913, p. 160.

Distribution.—Buzzards bay to Bay of Fundy, low water to 15 fathoms (Verrill); St. Andrews (Stafford); Canso (Fraser); many points from St. Andrews to L'Etang head, off Brier island.

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Family *HYDRACTINIDÆ*.Genus *HYDRACTINIA*.*HYDRACTINIA ECHINATA* (Fleming).*Alcyonium echinatum* FLEMING, Br. Animals, 1828, p. 517.*Hydractinia echinata* HINCKS, Br. Hyd. Zooph., 1868, p. 23.*polyclina* AGASSIZ, Cont. Nat. Hist., U.S., 1862, p. 227.

NUTTING, Hyd. Woods Hole, 1901, p. 335.

echinata WHITEAVES, Mar. Invert. East. Can., 1901, p. 21.

HARGITT, Am. Nat., 1901, p. 310.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Beaufort, 1912, p. 352.

FRASER, Hyd. Nova Scotia, 1913, p. 161.

Distribution.—New Jersey to Labrador (Verrill); St. Andrews, Malpeque, Gaspé, Seven islands (Stafford); Grand Manan (A. Agassiz); Canso (Fraser); High Duck island.

Family *MYRIOTHELIDÆ*.Genus *MYRIOTHELA*.*MYRIOTHELA PHRYGIA* (Fabricius).*Lucernaria phrygia* FABRICIUS, Fauna Grœnlandica, 1780, p. 343.*Myriothela phrygia* HINCKS, Br. Hyd. Zooph., 1868, p. 77.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 20.

Distribution.—"Grand Manan, bay of Fundy, W. Stimpson" (L. Agassiz).

Family *PENNARIDÆ*.Genus *ACAULIS*.*ACAULIS PRIMARIUS* Stimpson.*Acaulis primarius* STIMPSON, Mar. Invert. Grand Manan, 1854, p. 10.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 21.

Distribution.—Grand Manan, 5 to 15 fathoms (Stimpson).

Family *CORYMORPHIDÆ*.Genus *CORYMORPHA*.*CORYMORPHA PENDULA* Agassiz.*Corymorpha nutans* STIMPSON, Mar. Invert. Grand Manan, 1854, p. 9.*pendula* AGASSIZ, Cont. Nat. Hist. U. S., vol. iv, 1862, p. 227.

NUTTING, Hyd. Woods Hole, 1901, p. 337.

HARGITT, Am. Nat., 1901, p. 312.

Monocaulis glacialis WHITEAVES, Mar. Invert. East. Can., 1901, p. 21.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Corymorpha pendula FRASER, Hyd. Nova Scotia, 1913, p. 161.

Distribution.—West Quoddy head, Welsh pool, Low Duck island, 4 to 15 fathoms, (Stimpson); bay of Fundy, Murray bay (Verrill); Rodger's island, Oak bay, Charlotte county (Ganong); St. Andrews (Stafford); Chedabucto bay (Fraser); St. Andrews, Wolves island, Harbour island, 25 fathoms.

Family *TUBULARIDÆ*.Genus *TUBULARIA*.*TUBULARIA COUTHOUYI* Agassiz.

- Tubularia couthouyi* AGASSIZ, Cont. Nat. Hist. U. S., 1862, p. 266.
 A. AGASSIZ, N. A. Acalephæ, 1865, p. 196.
 NUTTING, Hyd. Woods Hole, 1901, p. 338.

Distribution.—Grand Manan (A. Agassiz).

TUBULARIA CROCEA (Agassiz).

- Parypha crocea* AGASSIZ, Cont. Nat. Hist., U. S., 1862, p. 249.
Tubularia crocea NUTTING, Hyd. Woods Hole, 1901, p. 340.
 HARGITT, Am. Nat., 1901, p. 315.
 FRASER, New England Hydroids, 1912, p. 42.
 FRASER, Hyd. Nova Scotia, 1913, p. 162.

Distribution.—Canso (Fraser); Katy cove, St. Andrews, L'Etang head, Weir stakes, St. Andrews island.

TUBULARIA INDIVISA Linnæus.

- Tubularia indivisa* LINNÆUS, Syst. Nat. 1767, p. 1301.
 STIMPSON, Mar. Invert. Grand Manan, 1853, p. 9.
 HINCKS, Br. Hyd. Zooph., 1868, p. 115.
 WHITEAVES, Mar. Inv. East. Can., 1901, p. 21.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

Distribution.—Grand Manan (Stimpson); Sable island (Dawson); Le Have bank (Smith and Harger); St. Andrews (Stafford); St. Andrews, Joe's point, off Deer island, off L'Etang head.

TUBULARIA LARYNX Ellis and Solander.

- Tubularia larynx* ELLIS AND SOLANDER, Nat. Hist. of Zooph., 1786, p. 31.
 STIMPSON, Mar. Invert. Grand Manan, 1854, p. 9.
 HINCKS, Br. Hyd. Zooph., 1868, p. 118.
 NUTTING, Hyd. Woods Hole, 1901, p. 338.
 WHITEAVES, Mar. Invert. East Can., 1901, p. 20.

Thamnocnidia larynx STAFFORD, Fauna Atlantic Coast, 1912, p. 72.

Tubularia larynx FRASER, Hyd. Nova Scotia, 1913, p. 162.

Distribution.—Grand Manan (Stimpson); Orphan bank (Whiteaves); Gaspé bay (Dawson); St. Andrews, Malpeque, Gaspé (Stafford); Barrington passage (Fraser); York harbour, Newfoundland.

TUBULARIA SPECTABILIS (Agassiz).

- Thamnocnidia spectabilis* AGASSIZ, Cont. Nat. Hist. U. S., vol. iv, 1862, p. 271.
Tubularia spectabilis NUTTING, Hyd. Woods Hole, 1901, p. 339.
Distribution.—Minister's bay, east point of Bliss island.

TUBULARIA TENELLA (Agassiz).

- Thamnocnidia tenella* AGASSIZ, Cont. Nat. Hist. U.S., vol. iv, 1862, p. 275.
Tubularia tenella NUTTING, Hyd. Woods Hole, 1901, p. 339.
 HARGITT, Am. Nat., 1901, p. 314.
 WHITEAVES, Mar. Invert. East. Can., 1901, p. 20.
 FRASER, Hyd. Nova Scotia, 1913, p. 162.

Distribution.—Bay of Fundy, low water to 40 fathoms (Verrill); St. Andrews, Canso, Gaspé, Seven islands (Stafford); Canso (Fraser); Niger reef, weir stakes, St. Andrews island.

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Sub-order CALYPTOBLASTEÆ.

Family CAMPANULARIDÆ.

Genus CAMPANULARIA.

CAMPANULARIA AMPHORA (Agassiz).

Laomedea amphora AGASSIZ, Cont. Nat. Hist. U. S., vol. iv, 1862, p. 311.*Campanularia amphora* NUTTING, Hyd. Woods Hole, 1901, p. 347.

HARGITT, Am. Nat., 1901, p. 384.

FRASER, Hyd. Nova Scotia, 1913, p. 163.

NUTTING, Am. Hyd., pt. iii, 1915, p. 50.

Distribution.—Grand Manan (A. Agassiz); Canso (Fraser); Grand Manan (Nutting).

CAMPANULARIA FLEXUOSA (Hincks).

Laomedea flexuosa HINCKS, Ann. and Mag. Nat. Hist., 1861, p. 260.*Campanularia flexuosa* HINCKS, Br. Hyd. Zooph., 1868, p. 168.

NUTTING, Hyd. Woods Hole, 1901, p. 348.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 22.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 163.

NUTTING, Am. Hyd., iii, 1915, p. 45.

Distribution.—Bay of Fundy to gulf of St. Lawrence (Verrill); St. Andrews, Canso, Gaspé, Seven islands (Stafford); Canso (Fraser); Niger reef, weir stakes, St. Andrews island.

CAMPANULARIA GELATINOSA (Pallas).

Sertularia gelatinosa PALLAS, Elench. Zooph., 1766, p. 116.*Laomedea gelatinosa* STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.*Obelia gelatinosa* HINCKS, Br. Hyd. Zooph., 1868, p. 151.

NUTTING, Hyd. Woods Hole, 1901, p. 351.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 23.

Campanularia gelatinosa FRASER, Hyd. of Vancouver island, 1914, p. 135.*Obelaria gelatinosa* NUTTING, Am. Hyd., iii, 1915, p. 88.*Distribution*.—Métis (Dawson); Near Caribou island (Packard).

This species is discussed at length in the Vancouver island paper.

CAMPANULARIA GIGANTEA Hincks.

Campanularia gigantea HINCKS, Ann. and Mag., Nat. Hist., 1866, p. 297.

Br. Hyd. Zooph., 1868, p. 174.

NUTTING, Am. Hyd., iii, 1915, p. 44.

Distribution.—Bay of Islands, Newfoundland, 50 to 60 fathoms, off Long island, 15 to 35 fathoms, St. Croix river, 5 to 10 fathoms.

CAMPANULARIA GRÆNLANDICA Levensen.

Campanularia grænlandica LEVENSEN, Medusæ, Ctenophorer, etc., 1893, p. 26.

FRASER, Hyd. Nova Scotia, 1913, p. 163.

FRASER, Hyd. of Vancouver island region, 1914, p. 136.

NUTTING, Am. Hyd., iii, 1915, p. 38.

Distribution.—Canso banks, 50 fathoms (Fraser); Quoddy river, east of Spruce island, 17 fathoms, between White and Spruce islands, off Head Harbour island, 25 fathoms, off Deer point, Campobello island, off Brier island, 22 fathoms.

CAMPANULARIA HINCKSI Alder.

- Campanularia hincksi* ALDER, Trans. Tynes. F. C., iii, 1857, p. 162.
 HINCKS, Br. Hyd. Zooph., 1868, p. 162.
 NUTTING, Hyd. Woods Hole, 1901, p. 345.
 WHITEAVES, Mar. Invert. East. Can., 1901 p. 22.
 NUTTING, Am. Hyd., iii, 1915, p. 37.

Distribution.—Le Have bank, 45 fathoms (Smith and Harger).

CAMPANULARIA INTEGRATA MacGillivray.

- Campanularia integra* MACGILLIVRAY, Ann. and Mag. Nat. Hist., 1842, p. 465.
 HINCKS, Br. Hyd. Zooph., 1868, p. 163.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 NUTTING, Am. Hyd., iii, 1915, p. 33.

Distribution.—Seven islands (Stafford); Spruce island, Brier island, 33 to 39 fathoms.

CAMPANULARIA MAGNIFICA, Fraser.

- Campanularia magnifica* FRASER, Hyd. Nova Scotia, 1913, p. 164.
 NUTTING, Am. Hyd., iii, 1915, p. 47.

Distribution.—Canso banks, 50 fathoms (Fraser); Off Newfoundland (Nutting).

CAMPANULARIA NEGLECTA (Alder).

- Laomedea neglecta* ALDER, Trans. Tynes. F. C., iii, 1857, p. 33.
Campanularia neglecta HINCKS, Br. Hyd. Zooph., 1868, p. 171.
 NUTTING, Hyd. Woods Hole, 1901, p. 346.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. Nova Scotia, 1913, p. 165.
 NUTTING, Am. Hyd., iii, 1915, p. 46.

Distribution.—St. Andrews, Seven islands (Stafford); Canso (Fraser); throughout the area from Grand Manan to the St. Croix river, off Brier island.

CAMPANULARIA SPECIOSA Clark.

- Campanularia speciosa* CLARK, Alaskan Hydroids, 1876, p. 171.
 LEVINSEN, Medusæ, etc., 1893, p. 167.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. V. I. region 1914, p. 139.
 NUTTING, Am. Hyd., iii, 1915, p. 48.

Distribution.—Gaspé, Seven islands (Stafford).

The hydroids reported by Stafford as belonging to this species, in all probability, belong to the species *C. magnifica*. In the Vancouver island paper attention has been called to the fact that similar mistakes have been made elsewhere owing to similarity of the trophosome. The gonangia in the two species bear no resemblance to each other.

CAMPANULARIA VERTICILLATA (Linnæus).

- Sertularia verticillata* LINNÆUS, Syst. Nat., 1758, p. 811.
Campanularia verticillata HINCKS, Br. Hyd. Zooph., 1868, p. 167.
 NUTTING, Hyd. Woods Hole, 1901, p. 347.
 WHITEAVES, Mar. Invert. East. Can., 1901, p. 22.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. Nova Scotia, 1913, p. 165.
 NUTTING, Am. Hyd. iii, 1915, p. 29.

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Distribution.—Le Have banks, 45 fathoms (Smith and Harger); gulf of St. Lawrence (Packard); gulf of St. Lawrence, 20 to 50 fathoms (Whiteaves); St. Andrews, Gaspé, Seven islands (Stafford); Chedabucto bay, 50 fathoms (Fraser); Nova Scotia (Nutting); at several points in the area between Sand Reef light, L'Etang head and the north end of Campobello island.

CAMPANULARIA VOLUBILIS (Linnæus).

Sertularia volubilis LINNÆUS, Syst. Nat., 1767, p. 1311.

Campanularia volubilis HINCKS, Br. Hyd. Zooph., 1868, p. 160.

NUTTING, Hyd. Woods Hole, 1901, p. 345.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 22.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 165.

NUTTING, Am. Hyd., iii, 1915, p. 31.

Distribution.—Bay of Fundy, low water to 60 fathoms (Verrill); gulf of St. Lawrence, off Cap des Rosiers lighthouse in 7 fathoms (Whiteaves); St. Andrews, Gaspé, Seven islands (Stafford); Barrington passage, 5 fathoms, Canso banks, 50 fathoms (Fraser); at various points from the south end of Grand Manan to the head of Passamaquoddy bay, Brier island, 33 to 39 fathoms.

Genus CLYTIA.

CLYTIA CYLINDRICA Agassiz.

Clytia cylindrica AGASSIZ, Cont. Nat. Hist. U.S., iv, 1862, p. 306.

Platypyxis cylindrica A. AGASSIZ, N. A. Acelephæ, 1865, p. 80.

Clytia cylindrica FRASER, Hyd. Beaufort, 1912, p. 358.

FRASER, Grampus Hyd., 1915, p. 308.

NUTTING, Am. Hyd., iii, 1915, p. 58.

Distribution.—Chamcook har., 5 fathoms, off Bliss island.

CLYTIA EDWARDSI (Nutting).

Campanularia edwardsi NUTTING, Hyd. Woods Hole, 1901, p. 346.

Clytia edwardsi FRASER, West Coast Hyd., 1911, p. 34.

FRASER, New England Hyd., 1912, p. 44.

FRASER, Hyd. V. I. region, 1914, p. 143.

NUTTING, Am. Hyd., iii, 1915, p. 60.

Distribution.—St. Andrews Pt.

CLYTIA JOHNSTONI (Alder).

(Fig. 3).

Campanularia johnstoni ALDER, Ann. and Mag. Nat. Hist., 1856, p. 359.

Clytia johnstoni HINCKS, Br. Hyd. Zooph., 1868, p. 143.

Clytia bicophora AGASSIZ, Cont. Nat. Hist. U.S., iv, 1862, p. 304.

NUTTING, Hyd. Woods Hole, 1901, p. 343.

Clytia grayi NUTTING, Hyd. Woods Hole, 1901, p. 344.

Clytia bicophora HARGITT, Am. Nat. 1901, p. 381.

Clytia johnstoni WHITEAVES, Mar. Invert., East. Can., 1901, p. 24.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1915, p. 165.

NUTTING, Am. Hyd., iii, 1915, p. 54.

Clytia bicophora NUTTING, Am. Hyd., iii, 1915, p. 56.

Distribution.—Bay of Fundy, low water to 40 fathoms (Verrill); Le Have bank, 45 fathoms (Smith and Harger); Orphan bank (Whiteaves); St. Andrews (Stafford); Barrington passage, shallow water, Canso, low water (Fraser); Grand Manan (A. Agassiz); at various points from the south end of Grand Manan to the head of Passamaquoddy bay, off Brier island, 22 fathoms.

Since Agassiz described specimens from the New England coast and the Bay of Fundy as belonging to a new species *Clytia bicophora*, few authors have considered the species distinct from *Clytia johnstoni*. Nutting, in his Woods Hole paper, and later in his monograph, treats it so, but in his later paper he has included his earlier species, *Clytia grayi*, with *Clytia johnstoni*. He states that *Clytia bicophora* is a much more delicate and smaller species, the hydrothecæ of *C. johnstoni* being on the average twice as long and wide as those of *C. bicophora*, and later, "The diagnostic marks of *Clytia bicophora* are the comparatively small size of the hydrothecæ, the presence of a simple instead of a complex diaphragm, and the tenuity of the hydrothecal walls." He speaks of the diaphragm of *C. johnstoni* as being "strong, thicker than usual, and the basal chamber well shown." The hydrotheca of *C. johnstoni* is said to have 16 teeth, that of *C. bicophora*, 12 to 14.

In the material under consideration there were specimens of this species, or of these species, from 18 localities, ranging from the southern end of Grand Manan island, through Passamaquoddy bay and up the St. Croix river, the very region from which Agassiz obtained some of his specimens. There were also some from St. Mary bay on the Nova Scotia side of the Bay of Fundy. For comparison I have specimens from Canso, N.S., and Woods Hole, Mass., together with specimens of *Clytia johnstoni* from the coast of Devon, England, obtained from the British museum.

First considering the size of the hydrothecæ, Nutting gives no measurements, the figures are not all drawn to the same scale of magnification and the scale is not given in any instance, hence it is impossible to be sure what size he considers suitable for each species. It is possible to find in one locality a variation as great as he gives as the distinction and sometimes not far from that much variation in the one colony. The average size of the English specimens is much the same as that of the Canso and Woods Hole specimens and scarcely any of those found in the bay of Fundy were smaller than these, the majority being larger and some of them being much larger. Those from St. Mary bay were larger and most of those from Passamaquoddy bay and vicinity are also; those well in from the direct waters of the bay of Fundy are, in general, larger than those more nearly out in the open. Thus, those from the vicinity of Deer island and at the mouth of the St. Croix river are larger on the average than those obtained from Grand Manan, the Wolves and Bliss island.

Some measurements will show this: The length of the hydrothecæ in the Devon, Canso, and Woods Hole specimens, varies from 0.5 to 0.65mm., St. Mary bay, 0.55 to 0.65, Grand Manan, 0.45 to 0.8, Bliss island, 0.5 to 0.75, Deer island, 0.6 to 1.0, mouth of the St. Croix river, 0.75 to 1.05. The length varies from 1.5 to 2 times the breadth. The largest specimens answer well to the type on which Nutting based the species, *C. grayi*. It is scarcely probable that Nutting described *C. bicophora* from specimens with hydrothecæ half the length of the smallest of these. It is more likely that there is a variation in size in the British specimens as there is in the bay of Fundy specimens and possibly Nutting has examined some of the larger ones while I have some of the smaller ones.

With regard to the thickness of the diaphragm, it is quite natural that the larger specimens have thicker diaphragms than the smaller but I find that when the smaller ones are examined under higher magnification, so that they appear equal in size to the larger, there is no constant difference in the appearance of the diaphragm. This is borne out by Nutting's figures. In fig. 3, pl. XII, where the drawing of the hydrotheca of *C. bicophora* is shown as large as that of *C. johnstoni* in the preceding plate, the diaphragm is shown even more plainly than in the drawing of *C. johnstoni*. The same is true in the case of the basal chamber.

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The tenuity of the hydrothecal walls may vary much in the same species and the collapsible appearance is often due to the length of time the hydroids are in stale water before they are examined or before they are preserved.

Finally as to the number of teeth in the margin of the hydrothecæ, the number may vary from 12 to 16 in the hydrothecæ of the same colony and they appear to be just as liable to be numerous in the small hydrothecæ as in the large ones.

While the chasm is a great one between the small specimens and the very large ones, when only those are seen, it becomes entirely bridged when all graduations are brought into view also. The conclusion that all specimens recorded as *C. bicophora*, *C. grayi* and *C. johnstoni* should be all included in the one species *C. johnstoni* (Alder) to me seems unavoidable.

CLYTIA NOLIFORMIS (McCrary).

Campanularia noliformis MCCRARY, Gymno. Charleston har., 1857, p. 92.

Clytia noliformis NUTTING, Hyd. Woods Hole, 1901, p. 343.

FRASER, Hyd. Beaufort, 1912, p. 359.

STAFFORD, Fauna Atlantic coast, 1912, p. 73.

NUTTING, Am. Hyd., iii, 1915, p. 57.

Distribution.—Canso, Gaspé, Seven islands (Stafford); Briar island, 33 to 39 fathoms, on sargassum in Gulf Stream, east of Nova Scotia.

Genus EUCOPELLA.

EUCOPELLA CALICULATA (Hincks).

Campanularia caliculata HINCKS, Ann. and Mag. Nat. Hist., 1853, p. 178.

Clytia (Orthopyxis) poterium AGASSIZ, Cont. Nat. Hist. U. S., 1862, p. 297.

Orthopyxis poterium A. AGASSIZ, N. A. Acalephæ, 1865, p. 223.

Orthopyxis caliculata VERRILL, Mar. Invert. Vineyard sound, 1873, p. 408.

Campanularia poterium NUTTING, Hyd. Woods Hole, 1901, p. 344.

Campanularia caliculata HARGITT, Am. Nat., 1901, p. 383.

WHITEAVES, Mar. Invert. Eastern Canada, 1901, p. 23.

STAFFORD, Fauna Atlantic coast, 1912, p. 73.

Eucopella caliculata FRASER, Hyd. Nova Scotia, 1913, p. 166.

FRASER, Hyd. V. I. region, 1914, p. 147.

Orthopyxis caliculata BALE, Proc. Roy. Soc. Vict., 1914, p. 72.

NUTTING, Am. Hyd., iii, 1915, p. 64.

Distribution.—Bay of Fundy, low water to 30 fathoms, gulf of St. Lawrence at the Mingan islands, 6 fathoms (Verrill); Henley harbour, strait of Belle Isle, 20 to 30 fathoms (Packard); Seven islands (Stafford); Canso, 20 fathoms (Fraser); Sea Coal bay, N.S. (A. Agassiz).

In my previous papers where this species was recorded the name *Eucopella caliculata* has been used but now Bale and Nutting intimate that *Eucopella* must be discarded for *Orthopyxis*. It seems to be putting a big stretch on the law of priority when it is made to cover a name that was first applied to a subgenus and later a genus but admittedly never defined. It is all very well to speak of the "elaborate description" given by Agassiz for *Clytia (Orthopyxis) poterium*, but it was not sufficiently elaborate to give recognition to the fact that the species had already been described. In any case the description was not complete enough to convince Hincks of the necessity for the new genus for, while recognizing the identity of *Clytia poterium* with his own *Campanularia caliculata* in his 1868 work, he retains the name *Campanularia*.

Little stress can be laid on the fact that A. Agassiz used the name *Orthopyxis* in 1865 as there he simply refers to his father's collections without farther remarks.

A stronger argument for retaining *Orthopyxis* appears in the fact that Verrill used *Orthopyxis caliculata* in all the references to the species in his paper in 1873, giving a description of the species but not of the genus on page 408, but as he returns to *Campanularia caliculata* in 1874 and again in 1879, the argument loses its strength. Nutting has evidently overlooked these references of Verrill's for he says: "I cannot find any author has used the name *Orthopyxis* since 1865."

The name *Eucope* has a different status for when von Lendenfeld introduced it in 1885 he defined the genus and other definitions given since then do not conflict with his definition. Since the genus *Orthopyxis* had not been previously defined, Bale and Nutting are really substituting a new genus for *Eucope*, although retaining all the characteristics of that genus, for although a name is given that had been used previously, they do not know and never can know that Agassiz had any such characteristics in mind when he applied the subgeneric name *Orthopyxis* to his species *poterium*.

Genus GONOTHYRÆA.

GONOTHYRÆA GRACILIS (Sars).

Laomedea gracilis Sars, Beretn. om zool. Reise, etc., 1851, p. 18.

Gonothyraea gracilis ALLMAN, Ann. and Mag. Nat. Hist., 1864, p. 374.

HINCKS, Br. Hyd. Zooph., 1868, p. 183.

FRASER, Hyd. Beaufort, 1912, p. 361.

FRASER, Hyd. Nova Scotia, 1913, p. 166.

NUTTING, Am. Hyd., iii, 1915, p. 70.

Distribution.—Canso, Barrington passage, low water (Fraser); off High Duck island, between Two and Three islands, off Swallowtail light, 30 to 40 fathoms off Bliss island, off St. Andrews point, off Joe's point, off Dochet island.

GONOTHYRÆA LOVENI (Allman).

Laomedea loveni ALLMAN, Ann. and Mag. Nat. Hist., 1859, p. 138.

Gonothyraea loveni ALLMAN, Ann. and Mag. Nat. Hist., 1864, p. 374.

NUTTING, Hyd. Woods Hole, 1901, p. 352.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 166.

NUTTING, Am. Hyd., iii, 1915, p. 69.

Distribution.—St. Andrews, Gaspé, Malpeque, Seven islands (Stafford); Chedabucto bay, 20 fathoms (Fraser); Nigger reef, off Joe's point, off Head Harbour island, Cumming's cove, 5 to 40 fathoms.

Stafford mentions a species of *Gonothyraea* which occurs at Malpeque, between the clustered stems of *Tubularia*: "Its hydrotheca has about 24 long, narrow, rigid, sharp teeth, separated by broad, rounded spaces below and continuing as thickened lines down the hydrotheca." It is unfortunate that he did not describe this species more fully and give figures of it, since, as far as I am aware, there has been no species of *Gonothyraea* described with hydrothecæ like these. *Gonothyraea gracilis* (Sars) has hydrothecæ with long, slender, sharp, teeth but each hydrotheca has only 10 to 12 of them. Twenty-four is an unusually large number of teeth to be found on the hydrothecal margin of any hydroid species. The thickened longitudinal lines have not been mentioned in connection with other species of this genus.

Genus OBELIA.

OBELIA ARTICULATA (A. Agassiz).

(Fig. 1.)

Eucope articulata A. Agassiz, N. A. Acalephæ, 1865, p. 89.

Trophosome.—Largest colonies reaching a height of 7 cm., most of them much less than this; stem usually simple, although in some of the large colonies there is a

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slight indication of fasciculation; main stem continuous throughout and distinctly heavier than any of the branches; branches short and slender; main stem and branches with two to four annulations above the point where the branch or pedicel comes off; branches similarly annulated at their origin. Hydrothecate pedicels arising from each axil and one or two from each node, usually annulated throughout; hydrothecæ much deeper than wide; margin with 12 to 14 low, rounded teeth.

Gonosome.—Gonangia much elongated, with a distinct collar, borne on pedicels that are annulated throughout. They appear in the axils of the pedicels and smaller branches and at times are very numerous.

Distribution.—St. Croix river, reef near Biological station, off Joe's point, off St. Andrews point, St. Andrews island, Chamcook harbour, Minister's island, Wolves island, off Swallowtail light, Grand Manan.

I have no doubt that this species which is common in the vicinity of the Biological station is the same as A. Agassiz described as *Eucope articulata* but his description is not very complete, hence I have included a full description at this time. The species resembles *Obelia dichotoma* in its mode of branching, *O. longissima* in the nature and arrangement of the hydrothecæ and *O. commissuralis* in the nature and arrangement of the gonangia. It is so much like these species in these respects that unless one gets a complete fertile colony it is somewhat difficult at times to be sure that it is not one of these species. It is quite possible that some of the records given for these other species should have been given for *O. articulata*.

OBELIA COMMISSURALIS McCrady.

- Obelia commissuralis* McCrady, Gymno. Charleston har., 1857, p. 95.
 NUTTING, Hyd. Woods Hole, 1901, p. 350.
 HARGITT, Am. Nat., 1901, p. 382.
 WHITEAVES, Mar. Invert. East. Can., 1901, p. 23.
 FRASER, Hyd. Nova Scotia, 1913, p. 167.
 NUTTING, Am. Hyd., iii, 1915, p. 83.

Distribution.—Grand Manan (Verrill); Canso, low water (Fraser); Grand Manan (A. Agassiz); Seven islands.

OBELIA DICHOTOMA (Linnæus).

- Sertularia dichotoma* Linnæus, Syst. Nat., 1758, p. 812.
Obelia dichotoma HINCKS, Br. Hyd. Zooph., 1868, p. 156.
 NUTTING, Hyd. Woods Hole, 1901, p. 350.
 WHITEAVES, Mar. Invert. East. Can., 1901, p. 23.
Obelia pyriformis WHITEAVES, Mar. Invert. East. Can., 1901, p. 23.
Obelia dichotoma STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. Nova Scotia, 1913, p. 167.
 NUTTING, Am. Hyd., iii, 1915, p. 80.

Distribution.—Nova Scotia, Métis (Dawson); St. Andrews, Gaspé, Seven islands (Stafford); Canso, low water (Fraser); Grand Manan (A. Agassiz); Joe's point, east of Spruce island 17 fathoms, Brier island, 33 to 39 fathoms.

OBELIA FLABELLATA (Hincks).

- Campanularia flabellata* HINCKS, Ann. and Mag. Nat. Hist., 1866, p. 297.
Obelia flabellata HINCKS, Br. Hyd. Zooph., 1868, p. 157.
 NUTTING, Hyd. Woods Hole, 1901, p. 350.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 NUTTING, Am. Hyd. iii, 1915, p. 84.

Distribution.—St. Andrews, Seven islands (Stafford); between White and Spruce islands.

OBELIA GENICULATA (Linnæus).

Sertularia geniculata LINNÆUS, Syst. Nat., 1767, p. 1312.

Obelia geniculata HINCKS, Br. Hyd. Zooph., 1868, p. 149.

NUTTING, Hyd. Woods Hole, 1901, p. 350.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 23.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 167.

FRASER, Grampus Hydroids, 1915, p. 73.

NUTTING, Am. Hyd., iii, 1915, p. 73.

Distribution.—Bay of Fundy and northward, low water to 40 fathoms (Verrill); gulf of St. Lawrence (Dawson); St. Andrews, Gaspé, Seven islands (Stafford); Barrington passage, 3 fathoms, Canso, low water (Fraser); High Duck island, Horse island, Whale cove, off Swallowtail light, Wolves, north of Green island, Bliss island, Deer island, off Joe's point, St. Andrews.

OBELIA HYALINA Clarke.

Obelia hyalina CLARKE, Bull. Mus. Comp. Zool., 1879, p. 241.

FRASER, Hyd. Beaufort, 1912, p. 363.

NUTTING, Am. Hyd., iii, 1915, p. 76.

Distribution.—On sargassum in the gulf stream, east of Nova Scotia.

OBELIA LONGISSIMA (Pallas).

Sertularia longissima PALLAS, Elench. Zooph., 1766, p. 119.

Obelia longissima HINCKS, Br. Hyd. Zooph., 1868, p. 154.

NUTTING, Hyd. Woods Hole, 1901, p. 351.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 23.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

NUTTING, Am. Hyd., iii, 1915, p. 85.

Distribution.—Bay of Fundy (Verrill); St. Andrews, Seven islands (Stafford); off Bliss island, Indian Head bay, off Joe's point, St. Andrews.

Family CAMPANULINIDÆ.

Genus CALYCELLA.

CALYCELLA SYRINGA (Linnæus).

Sertularia syringa LINNÆUS, Syst. Nat., 1767; p. 1311.

Campanularia syringa STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.

Calycella syringa HINCKS, Br. Hyd. Zooph., 1868, p. 206.

NUTTING, Hyd. Woods Hole, 1901, p. 355.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 23.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 168.

FRASER, Hyd. V. I. region, 1914, p. 156.

Distribution.—Off Duck island, 25 fathoms (Stimpson); Le Have bank, 45 fathoms (Smith and Harger); gulf of St. Lawrence, on the Orphan bank and about half-way between East cape, Anticosti, and the Bird rocks, in 313 fathoms (Whiteaves); St. Andrews, Malapeque, Gaspé, Seven islands (Stafford); Barrington passage, shallow water, Canso banks, 50 fathoms (Fraser); at almost all points where collecting was done in the bay of Fundy.

In my 1914 paper reasons are given for believing that *Calycella pygmæa* is not distinct from *Calycella syringa*

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Genus CUSPIDELLA.

CUSPIDELLA COSTATA Hincks.

Cuspidella costata HINCKS, Br. Hyd. Zooph., 1868, p. 210.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Gaspé (Stafford).

CUSPIDELLA GRANDIS Hincks.

Cuspidella grandis HINCKS, Br. Hyd. Zooph., 1868, p. 210.

WHITEAVES, Mar. Invert. East. Can., 1901, p. 24.

Distribution.—Orphan bank (Whiteaves); Coteau harbour, Long island, Labrador (Packard).

Genus OPERCULARELLA.

OPERCULARELLA LACERATA (Johnston).

Campanularia lacerata JOHNSTON, Br. Zooph., 1847, p. 120.*Opercularella lacerata* HINCKS, Br. Hyd. Zooph., 1868, p. 194.

NUTTING, Hyd. Woods Hole, 1901, p. 354.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 168.

Distribution.—St. Andrews (Stafford); Fox island, Chedabucto bay, low tide (Fraser); Niger reef, weir stakes, St. Andrews island, Brier island, 33 to 39 fathoms.

OPERCULARELLA PUMILA Clark.

Opercularella pumila CLARK, New England Hydroids, 1876, p. 61.*nana* HARTLAUB, Die Hydromedusen Helgolands, 1897, p. 502.*pumilla* HARGITT, Hyd. Woods Hole, 1909, p. 375.*Distribution.*—Weir stakes, St. Andrews island.

The description and figures given by Hartlaub for *Opercularella nana* agree perfectly with the creeping form of *Opercularella pumila* as described by Clark. Clark found but empty gonangia but Hartlaub found and described the complete gonosome. There is no question but that the species is distinct from *O. lacerata* (Johnston). In the specimens found in the Bay of Fundy, the hydrothecæ are only about half as long (.25) in *O. pumila* as they are in *O. lacerata* (.45 mm) and the gonangia are of an entirely different shape. In *O. lacerata* they are rounded or truncate at the distal end, while in *O. pumila* the distal portion is drawn out to become much more tubular.

All of the material obtained at St. Andrews I. was of the creeping type but it was well supplied with gonangia.

Genus STEGOPOMA.

STEGOPOMA PLICATILE (Sars).

Lafœa plicatile SARS, Forhandl., 1863, p. 31.*Stegopoma plicatile* LEVINSEN, Medusæ, Ctenophorer, etc., 1893, p. 36.

BROCH, Coelentérés du Fond, 1912, p. 11.

FRASER, Hyd. V. I. region, 1914, p. 161.

Distribution.—Bay of Islands, Newfoundland.

Genus TETRAPOMA.

TETRAPOMA QUADRIDENTATUM (Hincks).

Calycella quadridentata HINCKS, Ann. and Mag. Nat. Hist., 1874, p. 149.*Tetrapoma quadridentatum* LEVINSEN, Medusar, Ctenophorer, etc., 1893, p. 180.*Calycella quadridentata* STAFFORD, Fauna Atlantic Coast, 1912, p. 73.*Distribution.*—Gaspé (Stafford).

Family *HALECIDÆ*.Genus *HALECIUM*.*HALECIUM ARTICULOSUM* Clark.

- Halecium articulatum* CLARK, New England Hyd., 1876, p. 63.
 NUTTING, Hyd. Woods Hole, 1901, p. 358.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. V.I. region, 1914, p. 164.

Distribution.—St. Andrews (Stafford); Wolves, between White and Spruce islands, southwest of Deer island, off Sandreef light, 15 fathoms, off Harbour island, 25 fathoms, off Joe's point 10 fathoms, reef near Biological station.

HALECIUM BEANI (Johnston).

- Thoa beani* JOHNSTON, Br. Zooph., 1847, p. 120.
Halecium beani HINCKS, Br. Hyd. Zooph., 1868, p. 224.
 NUTTING, Hyd. Woods Hole, 1901, p. 358.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. Nova Scotia, 1913, p. 168.

Distribution.—St. Andrews, Seven Islands (Stafford); Barrington passage, 5f., Canso banks, 50f. (Fraser); at many points from the south end of Grand Manan to the head of Passamaquody bay.

HALECIUM CURVICAULE Lorenz.

- Halecium curvicaule* LORENZ, Polypomedusen von Jan Mayen, 1886, p. 3.
 BROCH, Hyd. Arkt. Meere, 1909, p. 150.

Distribution.—Off Joe's point, off Deer island, off Brier island, 33-39f.

HALECIUM GRACILE Verrill.

- Halecium gracile* VERRILL, Invert. An. Vineyard sd., 1873, p. 729.
 NUTTING, Hyd. Woods Hole, 1901, p. 358.
 WHITEAVES, Mar. Invert. E. Can., 1901, p. 24.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—St. Andrews, Seven islands (Stafford); reef near Biological Station St. Andrews, 5 to 10 fathoms.

HALECIUM HALECINUM (Linnæus).

- Sertularia halecina* LINNÆUS, Syst. Nat., 1767, p. 1308.
Halecium halecinum HINCKS, Br. Hyd. Zooph., 1868, p. 221.
 NUTTING, Hyd. Woods Hole, 1901, p. 357.
 WHITEAVES, Mar. Invert. E. Can., 1901, p. 24.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Chateau bay, strait of Bell Isle, 30 fathoms, Bay of Fundy (Packard); Bay of Fundy (Dawson); Bay of Fundy (Whiteaves); St. Andrews (Stafford); St. Andrews, off Deer island.

HALECIUM MINUTUM Broch.

- Halecium minutum* BROCH, Nordmeer gesammelten hydroiden, 1903, p. 4.
 FRASER, Hyd. Nova Scotia, 1913, p. 168.

Distribution.—Canso banks, 50 fathoms (Fraser); Brier island, 22 fathoms, Bay of Islands, Newfoundland. 50 to 60 fathoms.

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HALECIUM MURICATUM (Ellis and Solander).

Sertularia muricatum ELLIS AND SOLANDER, Nat. Hist. Zooph., 1786, p. 59.*Halecium muricatum* HINCKS, Br. Hyd. Zooph., 1868, p. 223.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 25.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 169.

Distribution.—15 miles south southeast of Bonaventure island, 50 fathoms (Whiteaves); off Caribou island, 30 to 50 fathoms, Square island, Labrador (Packard); St. Andrews, Canso, Gaspé (Stafford); Canso banks, 50 fathoms (Fraser); Quoddy river, 23 to 47 fathoms, Head Harbour island, Deer island, between Big Duck and Cheyne island, off Spruce island, 11 to 35 fathoms, between Two and Three islands, off Brier island, 33 to 39 fathoms.

HALECIUM SESSILE Norman.

Halecium sessile NORMAN, Hyd. Hebrides, 1866, p. 196.

HINCKS, Br. Hyd. Zooph., 1868, p. 229.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 25.

Distribution.—Between East cape, Anticosti and Bird rocks, 12 fathoms (Whiteaves).

HALECIUM TENELLUM Hincks.

Halecium tenellum HINCKS, Ann. and Mag. Nat. Hist., 1861, p. 252.

HINCKS, British Hyd. Zooph., 1868, p. 226.

NUTTING, Hyd. Woods Hole, 1901, p. 357.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 169.

Distribution.—St. Andrews, Gaspé, Seven islands (Stafford); Canso banks, 50 fathoms (Fraser); common from the north end of Campobello island to the head of Passamaquoddy bay, Brier island, Seven islands, bay of Islands, Newfoundland.

Family HEBELLIDÆ.

Genus HEBELLA.

HEBELLA CALCARATA (A. Agassiz).

Lafœa calcarata A. AGASSIZ, N. A. Acalephæ, 1865, p. 122.

HARGITT, Am. Nat., 1901, p. 387.

Hebella calcarata NUTTING, Hyd. Woods Hole, 1901, p. 353.

FRASER, Hyd. Beaufort, 1912, p. 371.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Canso (Stafford).

HEBELLA (?) *pocillum* Hincks.*Lafœa pocillum* HINCKS, Br. Hyd. Zooph., 1868, p. 204.

Distribution.—St. Andrews.

There was no gonosome present on the St. Andrews specimens to settle the question definitely as to whether this species is a *Lafœa* or an *Hebella* but as there is a distinct diaphragm in the hydrotheca, it agrees with *Hebella* in that respect and is so placed.

Family LAFCEIDÆ.

Genus CRYPTOLARIA.

CRYPTOLARIA TRISERIALIS Fraser.

Cryptolaria triserialis FRASER, Hyd. Nova Scotia, 1913, p. 170.

Distribution.—Off Durell island, Chedabucto bay, 20 fathoms (Fraser).

Genus FILELLUM.

FILELLUM SERPENS (Hassall).

Campanularia serpens HASSALL, Trans. Micro. Soc., 1852, p. 163.

Filellum serpens HINCKS, Br. Hyd. Zooph., 1868, p. 214.

Reticularia serpens VERRILL, Check-list, 1879, p. 79.

Filellum serpens FRASER, Beaufort Hydroids, 1912, p. 369.

FRASER, Hyd. Nova Scotia, 1913, p. 171.

Distribution.—Canso banks, 50 fathoms (Fraser); common from the north end of Campobello island to the head of Passamaquoddy bay and up the mouth of the St. Croix river, Brier island, 22 fathoms.

Genus GRAMMARIA.

GRAMMARIA ABIETINA (Sars).

Campanularia abietina SARS, Nyt. Mag. for Naturv., 1851, p. 139.

Grammaria robusta STIMPSON, Mar. Invert. Grand Manan, 1854, p. 9.

Grammaria abietina SARS, Norske Hydroider, 1863, p. 34.

Salacia abietina, HINCKS, Br. Hyd. Zooph., 1868, p. 212.

Lafea abietina BONNEVIE, Norske, Nordhavs-Ex., 1899, p. 64.

Grammaria abietina WHITEAVES, Mar. Invert. E. Can., 1901, p. 28.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 171.

FRASER, Hyd. V. I. region, 1914, p. 173.

Distribution.—Grand Manan (Stimpson); Le Have bank, 60 fathoms (Smith and Harger); gulf of St. Lawrence, Trinity bay, 25 fathoms, and elsewhere (Whiteaves); Gaspé, Seven islands (Stafford); Chedabucto bay, 20 fathoms (Fraser); bay of Islands, Newfoundland, 50 to 60 fathoms.

GRAMMARIA GRACILIS Stimpson.

Grammaria gracilis STIMPSON, Mar. Invert. Grand Manan, 1854, p. 9.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 28.

Distribution.—Grand Manan (Stimpson).

Genus LAFCEA.

LAFCEA DUMOSA (Fleming).

Sertularia dumosa FLEMING, Edin. Phil. Jour., 1828, p. 83.

Lafea dumosa HINCKS, Br. Hyd. Zooph., 1868, p. 200.

NUTTING, Hyd. Woods Hole, 1901, p. 355.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 24.

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Lafœa robusta WHITEAVES, Mar. Invert. E. Can., 1901, p. 24.
STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Lafœa dumosa FRASER, Hyd. Nova Scotia, 1913, p. 171.
FRASER, Hyd. V. I. Region, 1914, p. 174.

Distribution.—Nova Scotia (Agassiz); between Anticosti and Gaspé, 120 to 200 fathoms (Whiteaves); St. Andrews, Gaspé, Seven islands (Stafford); Chedabucto bay, 20 fathoms (Fraser); common in all the Passamaquoddy bay area, Brier island, 22 fathoms.

LAFCEA FRUTICOSA Sars.

Lafœa fruticosa SARS, Norske Hydroider, 1863, p. 30.
HINCKS, Br. Hyd. Zooph., 1868, p. 202.
BONNEVIE, Norske Nordhavs-Ex., 1899, p. 64.
VERRILL, Check-list, 1879, p. 17.
STAFFORD, Fauna Atlantic Coast, 1912, p. 172.
FRASER, Hyd. Nova Scotia, 1913, p. 172.

Distribution.—Seven islands (Stafford); Chedabucto bay, 20 fathoms (Fraser); Chamcook harbour, 5 fathoms.

LAFCEA GRACILLIMA (Alder).

Campanularia gracillima ALDER, Trans. Tynes Nat. F. C., 1857, p. 39.

Lafœa gracillima BONNEVIE, Norske Nordhavs-Ex., 1899, p. 64.
NUTTING, Hyd. Woods Hole, 1901, p. 356.
WHITEAVES, Mar. Invert. E. Can., 1901, p. 24.
STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
FRASER, Hyd. Nova Scotia, 1913, p. 172.
FRASER, Hyd. V. I. region, 1914, p. 175.

Distribution.—Bay of Fundy (Verrill); Le Have bank, 45 to 60 fathoms (Smith and Harger); Gaspé, Seven islands (Stafford); Canso banks, 50 fathoms (Fraser); Brier island, Seven islands, bay of Islands, Newfoundland, 50 to 60 fathoms.

LAFCEA PYGMÆA Hincks.

Lafœa pygmæa HINCKS, Br. Hyd. Zooph., 1868, p. 205.
Hebella pygmæa NUTTING, Hyd. Woods Hole, 1901, p. 353.
BROCH, Nordmeer ges. Hyd., 1903, p. 5.
FRASER, Hyd. Nova Scotia, 1913, p. 172.

Distribution.—Chedabucto bay, 25 fathoms (Fraser).

LAFCEA SYMMETRICA Bonnevie.

Lafœa symmetrica BONNEVIE, Norske Nordhavs-Ex., 1899, p. 64.
BILLARD, Ex. Sc. "Travailleur" et du "Talisman," 1907,
p. 176.
FRASER, Hyd. Nova Scotia, 1913, p. 172.

Distribution.—Chedabucto bay, 25 fathoms (Fraser).

Family SERTULARIDÆ.

Genus ABIETINARIA.

ABIETINARIA ABIETINA (Linnæus).

Sertularia abietina LINNÆUS, Syst. Nat., 1758, p. 808.
HINCKS, Br. Hyd. Zooph., 1868, p. 266.
WHITEAVES, Mar. Invert. E. Can., 1901, p. 25.

Sertularella abietina NUTTING, Hyd. Woods Hole, 1901, p. 361.

Abietinaria abietina NUTTING, Am. Hyd. ii, 1904, p. 114.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 173.

Distribution.—Off Nova Scotia, 51 fathoms (Allman); Mingan island, gulf of St. Lawrence and Labrador (Packard); gulf and river St. Lawrence (Dawson and Whiteaves); St. Andrews, Gaspé, Canso, Seven islands (Stafford); Canso banks, 50 fathoms (Fraser); St. George's bank, Newfoundland (A. Agassiz); off Swallowtail light, southwest of Deer island, Head harbour, McMaster island, off Joe's point, Seven islands.

ABIETINARIA FILICULA (Ellis and Solander.)

Sertularia filicula ELLIS AND SOLANDER, Nat. Hist. Zooph., 1786, p. 57.

STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.

HINCKS, Br. Hyd. Zooph., 1868, p. 264.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 25.

Abietinaria filicula NUTTING, Am. Hyd. ii, 1904, p. 123.

Distribution.—Grand Manan, 20 fathoms (Stimpson); Labrador (Packard).

NOTE.—Stafford reports specimens of an *Abietinaria* species from Seven Islands, Quebec, but as all the information he gives concerning it is that it "most resembles *A. gigantea* Clark," it is impossible to place it.

Genus DIPHASIA.

DIPHASIA FALLAX (Johnston.)

Sertularia fallax JOHNSTON, Br. Zooph., 1847, p. 73.

STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.

Diphasia fallax HINCKS, Br. Hyd. Zooph., 1868, p. 249.

NUTTING, Hyd. Woods Hole, 1901, p. 361.

HARGITT, Am. Nat., 1901, p. 391.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 26.

NUTTING, Am. Hyd. ii, 1904, p. 114.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 173.

Distribution.—Grand Manan (Stimpson); Bay of Fundy, 20 to 55 fathoms (Verrill); St. Andrews (Stafford); Barrington passage, 4 fathoms (Fraser); common throughout the Passamaquoddy bay area, Brier island, 22 fathoms.

DIAPHASIA ROSACEA (Linnæus).

Sertularia rosacea LINNÆUS, Syst. Nat., 1758, p. 807.

Diphasia rosacea HINCKS, Br. Hyd. Zooph., 1868, p. 245.

NUTTING, Hyd. Woods Hole, 1901, p. 361.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 26.

NUTTING, Am. Hyd., ii, 1904, p. 107.

STAFFORD, Fauna Atlantic Coast, 1912, p. 74.

FRASER, Hyd. Nova Scotia, 1913, p. 174.

Distribution.—Strait of Belle Isle, 50 fathoms (Packard); St. Andrews (Stafford); Barrington passage (Fraser); off Deer island, 15 fathoms, off Frost ledges, Quoddy river, between White and Spruce islands, between Two and Three islands, Brier island, 33 to 39 fathoms.

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DIPHASIA TAMARISCA (Linnæus).

Sertularia tamarisca LINNÆUS, Syst. Nat., 1758, p. 808.*Sertularia producta* STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.*Diphasia tamarisca* HINCKS, Br. Hyd. Zooph., 1868, p. 273.*Sertularia producta* WHITEAVES, Mar. Invert. E. Can., 1901, p. 27.*Diphasia tamarisca* NUTTING, Am. Hyd., ii, 1904, p. 108.*Distribution*.—Grand Manan (Stimpson); Sea coal bay, N.S. (Verrill).

Nutting, apparently with good reason, has concluded that *Sertularia producta* Stimpson is synonymous with *Diphasia tamarisca* (Linnæus) and hence it is included here under that name.

Genus HYDRALLMANIA.

HYDRALLMANIA FALCATA (Linnæus).

Sertularia falcata LINNÆUS, Syst. Nat., 1758, p. 810.*Plumularia falcata* STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.*Hydrallmania falcata* HINCKS, Br. Hyd. Zooph., 1868, p. 273.

NUTTING, Hyd. Woods Hole, 1901, p. 364.

HARGITT, Am. Nat., 1901, p. 392.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 27.

NUTTING, Am. Hyd., ii, 1904, p. 124.

STAFFORD, Fauna Atlantic Coast, 1912, p. 74.

FRASER, Hyd. Nova Scotia, 1913, p. 174.

Distribution.—Grand Manan, 25 to 35 fathoms (Stimpson); bay of Fundy, low water to 110 fathoms, Anticosti, Mingan islands (Verrill); Le Have bank, 60 fathoms, Chebucto head, Halifax harbour, 20 fathoms (Smith and Harger); Sable island, Gaspé, Métis (Dawson); gulf of St. Lawrence (Whiteaves); Grand Manan (A. Agassiz); St. Andrews, Gaspé, Seven islands (Stafford); Barrington passage (Fraser); one of the comonest species of large size in the collection.

Genus SELAGINOPSIS.

SELAGINOPSIS MIRABILIS (Verrill).

Diphasia mirabilis VERRILL, Amer. Jour. Sci. Arts, 1872, p. 9.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 26.

Selaginopsis mirabilis NUTTING, Am. Hyd., ii, 1904, p. 128.

STAFFORD, Fauna Atlantic Coast, 1912, p. 74.

FRASER, Hyd. Nova Scotia, 1913, p. 174.

Distribution.—Le Have bank, 60 fathoms (Smith and Harger); Gaspé, Seven islands (Stafford); Canso banks, 50 fathoms (Fraser).

Genus SERTULARELLA.

SERTULARELLA CONICA Allman.

Sertularella conica ALLMAN, Hyd. Gulf Stream, 1877, p. 21.

NUTTING, Am. Hyd., ii, 1904, p. 79.

FRASER, Hyd. Nova Scotia, 1913, p. 174.

Distribution.—Canso banks, 50 fathoms (Fraser).

SERTULARELLA FUSIFORMIS (Hincks).

- Sertularia fusiformis* HINCKS, Ann. and Mag. Nat. Hist., 1861, p. 253.
 HINCKS, Br. Hyd. Zooph., 1868, p. 243.
 WHITEAVES, Mar. Invert. E. Can., 1901, p. 26.

Sertularella fusiformis NUTTING, Am. Hyd., ii, 1904, p. 89.

Distribution.—Gulf of St. Lawrence, between Anticosti and Gaspé, 200 fathoms (Whiteaves).

SERTULARELLA POLYZONIAS (Linnæus).

- Sertularia polyzonias* LINNÆUS, Syst. Nat., 1758, p. 813.
 STIMPSON, Mar. Invert. Grand Manan, 1854, p. 9.

Sertularella polyzonias HINCKS, Br. Hyd. Zooph., 1868, p. 235.
 NUTTING, Hyd. Woods Hole, 1901, p. 362.
 WHITEAVES, Mar. Invert. E. Can., 1901, p. 25.
 NUTTING, Am. Hyd., ii, 1904, p. 90.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. Nova Scotia, 1913, p. 175.

Distribution.—Grand Manan, 10 to 40 fathoms (Stimpson); Le Have bank, 60 fathoms (Smith and Harger); Caribou island, (Packard); gulf of St. Lawrence (Whiteaves); St. Andrews, Gaspé, Seven islands (Stafford); Chedabucto bay, 10 to 20 fathoms (Fraser); common throughout the Passamaquoddy bay area, Seven islands.

SERTULARELLA RUGOSA (Linnæus).

- Sertularia rugosa* LINNÆUS, Syst. Nat., 1758, p. 809.
 STIMPSON, Mar. Invert. Grand Manan, 1854, p. 9.

Sertularella rugosa HINCKS, Br. Hyd. Zooph., 1868, p. 259.

Sertularia rugosa WHITEAVES, Mar. Invert. E. Can., 1901, p. 25.

Sertularella rugosa NUTTING, Am. Hyd., ii, 1904, p. 82.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Grand Manan, deep water (Stimpson); Square island, Labrador, 30 fathoms (Packard); Seven islands (Stafford); High Duck island, between White and Spruce islands, Cumming's cove, West Quoddy head, Dochet island.

SERTULARELLA TRICUSPIDATA (Alder).

- Sertularia tricuspidata* ALDER, Ann. and Mag. Nat. Hist., 1856, p. 356.

Sertularella tricuspidata HINCKS, Br. Hyd. Zooph., 1868, p. 239.
 NUTTING, Hyd. Woods Hole, 1901, p. 362.
 WHITEAVES, Mar. Invert. E. Can., 1901, p. 26.
 NUTTING, Am. Hyd., ii, 1904, p. 71.
 STAFFORD, Fauna Atlantic Coast, 1912, p. 73.
 FRASER, Hyd. Nova Scotia, 1913, p. 175.

Distribution.—Bay of Fundy, 50 to 55 fathoms (Verrill); Le Have bank, 45 to 60 fathoms (Smith and Harger); gulf of St. Lawrence (Whiteaves); strait of Belle Isle, 40 fathoms (Packard); St. Andrews, Gaspé, Seven islands (Stafford); Canso banks, 50 fathoms (Fraser); very common everywhere in the Passamaquoddy bay area at all depths, Brier island, 33 to 39 fathoms.

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Genus SERTULARIA.

SERTULARIA CORNICINA (McCrary).

Dynamena cornicina MCCRARY, Gymno, Charleston Har., 1858, p. 204.*Sertularia cornicina* NUTTING, Hyd. Woods Hole, 1901, p. 359.

NUTTING, Am. Hyd., ii, 1904, p. 58.

FRASER, Hyd. Beaufort, 1912, p. 374.

Distribution.—On sargassum in the Gulf Stream, east of Nova Scotia.

SERTULARIA PUMILA Linnæus.

Sertularia pumila LINNÆUS, Syst. Nat., 1758, p. 807.

HINCKS, Br. Hyd. Zooph., 1868, p. 260.

NUTTING, Hyd. Woods Hole, 1901, p. 359.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 25.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 175.

Distribution.—Nova Scotia and Métis (Dawson); strait of Belle Isle, between tides (Packard); St. Andrews, Canso, Seven islands (Stafford); Canso; low water (Fraser); Grand Manan (A. Agassiz); High Duck island, Wolves, Indian Head bar, Souris, P.E.I., York harbour, bay of Islands, Newfoundland, Seven islands.

Genus THUIARIA.

THUIARIA ARGENTEA (Linnæus).

Sertularia argentea LINNÆUS, Syst. Nat., 1758, p. 809.

STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.

HINCKS, Br. Hyd. Zooph., 1868, p. 268.

Thuiaria argentea NUTTING, Hyd. Woods Hole, 1901, p. 364.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 27.

NUTTING, Am. Hyd., ii, 1904, p. 71.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. Nova Scotia, 1913, p. 176.

Distribution.—Grand Manan, 4 to 6 fathoms (Stimpson); Bay of Fundy, Nova Scotia coast, gulf of St. Lawrence, low water to 110 fathoms (Verrill); Northumberland strait, gulf of St. Lawrence (Whiteaves); Gaspé bay (Dawson); Caribou island, 8 fathoms (Packard); St. Andrews, Gaspé (Stafford); Barrington passage, 5 fathoms, Canso banks, 50 fathoms (Fraser); off Deer island, off Grand Manan, bay of Islands, Newfoundland, 50 to 60 fathoms.

THUIARIA CUPRESSINA (Linnæus).

Sertularia cupressina LINNÆUS, Syst. Nat., 1758, p. 808.

HINCKS, Br. Hyd. Zooph., 1868, p. 270.

Thuiaria cupressina NUTTING, Hyd. Woods Hole, 1901, p. 363.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 27.

NUTTING, Am. Hyd., ii, 1904, p. 72.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Off Nova Scotia, 51 fathoms (Allman); Bay of Fundy, low water to 100 fathoms (Verrill); Northumberland strait, gulf of St. Lawrence (Whiteaves); Henley harbour, strait of Belle Isle, 7 fathoms (Packard); St. Andrews (Stafford); St. Croix river, off Joe's point, McMaster island, Quoddy river, off Deer island, Whale cove, 20 to 30 fathoms, Brier island, 33 to 39 fathoms.

THUIARIA FABRICII (Levinsen).

Sertularia fastigiata FABRICIUS, Fauna Grœnlandica, 1780, p. 458.

Sertularia fabricii LEVINSEN, Vid. Middel. Naturh. Foren., 1892, p. 48.

Thuiaria fabricii NUTTING, Am. Hyd., ii, p. 1904, p. 71.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Gaspé, Islands (Stafford); St. Andrews.

THUIARIA IMMERSA Nutting.

Thuiaria immersa NUTTING, Am. Hyd., ii, 1904, p. 66.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Seven islands (Stafford); St. Croix river, Grand Manan, between Mohawk and Adam island, 35 fathoms, between Green and Three islands, McMaster island, off Deer island, off Brier island, 22 fathoms.

THUIARIA LATIUSCULA (Stimpson).

Sertularia latiuscula STIMPSON, Mar. Invert. Grand Manan, 1854, p. 8.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 26.

Thuiaria latiuscula NUTTING, Am. Hyd., ii, 1904, p. 69.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Grand Manan (Stimpson); Gaspé, Seven islands (Stafford); St. Andrews.

THUIARIA LONCHITIS (Ellis and Solander).

Sertularia lonchitis ELLIS AND SOLANDER, Nat. Hist. Zooph., 1786, p. 42.

Thuiaria articulata WHITEAVES, Mar. Invert. E. Can., 1901, p. 27.

Thuiaria lonchitis NUTTING, Am. Hyd., ii, 1904, p. 66.

FRASER, Hyd. Nova Scotia, 1913, p. 176.

Distribution.—Le Have bank, 45 fathoms (Smith and Harger); gulf of St. Lawrence (Whiteveaves); Canso banks, 50 fathoms (Fraser); St. Andrews.

THUIARIA ROBUSTA Clark.

Thuiaria robusta CLARK, Alaskan Hyd., 1876, p. 227.

NUTTING, Am. Hyd., ii, 1904, p. 64.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Gaspé, Seven islands (Stafford).

THUIARIA SIMILIS (Clark).

Sertularia similis CLARK, Alaskan Hyd., 1876, p. 219.

Thuiaria similis NUTTING, Am. Hyd., ii, 1904, p. 69.

FRASER, West Coast Hyd., 1911, p. 77.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

FRASER, Hyd. V. I. region, 1914, p. 199.

Distribution.—Gaspé (Stafford); St. Croix river, Quoddy river, West Quoddy head, Head Harbour island, 25 fathoms, Whale cove, Brier island, 22 fathoms, Seven islands.

THUIARIA TENERA (Sars).

Sertularia tenera SARS, Bidrag til Kundskaben etc., 1873, p. 20.

Thuiaria tenera NUTTING, Am. Hyd., ii, 1904, p. 70.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Gaspé, Seven islands (Stafford); St. Andrews, Brier island.

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THUIARIA THUJA (Linnæus).

Sertularia thuja LINNÆUS, Syst. Nat., 1758, p. 809.*Thuiaria thuja* HINCKS, Br. Hyd. Zooph., 1868, p. 275.

NUTTING, Hyd. Woods Hole, 1901, p. 364.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 26.

NUTTING, Am. Hyd., ii, 1904, p. 62.

STAFFORD, Fauna Atlantic Coast, 1912, p. 73.

Distribution.—Mingan islands (Packard); gulf of St. Lawrence (Whiteaves); Seven islands (Stafford); McMaster island, 30 fathoms.

NOTE.—Stafford refers to four species of *Thuiaria* from Gaspé, none of which he describes sufficiently to place, but apparently one of them is a *Synthecium* and is probably new and the others may be also.

Family PLUMULARIDÆ.

Genus AGLAOPHENOPSIS.

AGLAOPHENOPSIS CORNUTA (Verrill).

Cladocarpus cornutus VERRILL, Am. Jour. Sci. Arts, 1879, p. 310.*Aglaophenopsis cornuta* NUTTING, Am. Hyd., i, 1900, p. 120.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 28.

Distribution.—Off Sable island, on Banquereau, 200 fathoms (Verrill).

Genus ANTENNULARIA.

ANTENNULARIA AMERICANA Nutting.

Antennularia americana NUTTING, Am. Hyd., i, 1900, p. 69.

NUTTING, Hyd. Woods Hole, 1901, p. 368.

Distribution.—St. Andrews.

ANTENNULARIA ANTENNINA (Linnæus).

Sertularia antennina LINNÆUS, Syst. Nat., 1767, p. 1310.*Antennularia antennina* HINCKS, Br. Hyd. Zooph., 1868, p. 280.

NUTTING, Am. Hyd., 1900, p. 69.

NUTTING, Hyd. Woods Hole, 1901, p. 367.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 28.

STAFFORD, Fauna Atlantic Coast, 1912, p. 74.

Distribution.—Bay of Fundy, 10 to 60 fathoms (Verrill); St. Andrews (Stafford); channel off White Horse island.

Genus CLADOCARPUS.

CLADOCARPUS POURTALESII Verrill.

Cladocarpus pourtalesii VERRILL, Am. Jour. Sci. Arts, 1879, p. 309.

NUTTING, Am. Hyd., i, 1900, p. 116.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 28.

Distribution.—Southwest of cape Sable, 112 to 115 fathoms, Banquereau, off Sable island, 300 fathoms (Verrill).

CLADOCARPUS SPECIOSUS Verrill.

Cladocarpus speciosus VERRILL, Amer. Jour. Sci. Arts., 1879, p. 311.

NUTTING, Am. Hyd., i, 1900, p. 116.

WHITEAVES, Mar. Invert. E. Can., 1901, p. 28.

Distribution.—Banquereau, off Sable island, 200 fathoms (Verrill).

Genus PLUMULARIA.

PLUMULARIA SETACEOIDES Bale.

- Plumularia setaceoides* BALE, Hyd. S. Australia, 1881, p. 28.
FRASER, Hyd. Beaufort, 1912, p. 382.

Distribution.—On sargassum, Gulf Stream, east of Nova Scotia.

Genus SCHIZOTRICHA.

SCHIZOTRICHA GRACILLIMA (Sars).

- Plumularia gracillima* SARS, Vid. Selsk. Forh., 1873, p. 86.
Plumularia verrilli CLARK, Trans. Conn. Acad. Sci., 1876, p. 64.
VERRILL, Prelim. Check-list, 1879, p. 18.
Schizotricha gracillima NUTTING, Am. Hyd., i, 1900, p. 80.
NUTTING, Hyd. Woods Hole, 1901, p. 366.
STAFFORD, Fauna Atlantic Coast, 1912, p. 74.

Distribution.—Grand Manan (Stafford).

Genus THECOCARPUS.

THECOCARPUS MYRIOPHYLLUM (Linnæus).

- Sertularia myriophyllum* LINNÆUS, Syst. Nat., 1767, p. 1309.
Aglaophenia myriophyllum HINCKS, Br. Hyd. Zooph., 1868, p. 290.
Thecocarpus myriophyllum NUTTING, Am. Hyd., i, 1900, p. 107.
WHITEAVES, Mar. Invert. E. Can., 1901, p. 28.

Distribution.—Le Have bank, 60 fathoms (Smith and Harger); off cape Gaspé, 60 fathoms (Whiteaves); Mingan islands (A. Agassiz).

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1899. Den norske Nordhavsexpedition, 1876-78, vol. vi, pt. 26. *Zoologi Hydroida*, p. 1-103. Christiania.

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1903. Die von dem Norwegischen Fischereidampfer "Michael Sars," in den Jahren, 1900-1902, in dem Nordmeer gesammelten Hydroiden. *Bergens Museum Aarbog*, no. 9, p. 1-14. Christiania.
1909. Die Hydroiden der Arktischen Meere. *Fauna Arctica*, bd. v, Jena.
1912. *Coelentérés du Fond. Campagne Arctique de 1907*. Brussels.

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