

ART. VIII.—TWO CABLE HAULS OF MARINE INVERTEBRATES,—  
*By Cable Steamer Minia, Capt. Trott, Commander.*  
—REV. D. HONEYMAN, D. C. L., F. R. S. C., F. S.  
SC., &c., *Curator of the Provincial Museum,*  
*Halifax.*

The *first* Haul is of the Anglo-American or "Brest Cable"—of 1869.

The *second* of the Anglo-American or Duxbury Cable—of 1869.

The *first* Cable extends from St. Pierre to Brest, France.

The *second* from St. Pierre to Duxbury, Mass., U. S. A.

The portion of the *first* to which our invertebrates were attached lay in lat.  $44^{\circ} 38'$ ; long.  $54^{\circ} 6'$ , and depth 570 fathoms. Of the *second*, in lat.  $43^{\circ} 4' 38''$ ; long.  $66^{\circ} 14' 30''$ , and depth 48 fathoms. We are under great obligations to Capt. Trott for the gift of the interesting and important material, which we have submitted to a thorough examination, the results of which we now propose to communicate. It is interesting to know that the part of the first cable in question was brought up on the 19th anniversary of the laying of it, July 11, 1888. That of the second cable, Oct. 26, 1888. The position of the first was on the side of the Grand Bank, near the Gulf Stream. Of the second, in the Bay of Fundy, west of Seal Island. The creatures of the first are far below the extension of solar light and heat, while those of the second enjoy both. We may, therefore, expect differences in character and constitution of the attaches of the respective cables.

I would here observe that the attaches of the "glacial boulders" of the Nova Scotia Fishing Banks, described in our January paper, from the depth of sixty fathoms, may be expected to correspond in character and constitution with those of the second cable and to differ from those of the first.

It is possible that the fauna of the second cable may be less

complete than that of the first, and that we may have to supplement it with our boulder fauna for the purpose of comparison and illustration.

As in the paper "On Boulders" we classify thus:

*Sub-Kingdoms.*

- I.—(1.)—PROTOZOA.
- (2.)—PARAZOA.
- II.— CŒLEENTERATA.
- III.— ANNULOIDA.
- IV.— ANNULOSA.
- V.— MOLLUSCA.

I.—PROTOZOA—*Foramenifera.*

As might be expected, on account of depth, we have on the first cable *Orbulina universa*, *Globigerina bulloides*, *Nodosaria*, &c. These are found separately and in agglutinated tubes of *Annelida* found in the hempen debris of the cable.

On the second cable foramenifera were also found, firmly attached to other objects. On the Nova Scotia "Fishing Banks" similar ones are found—e. g., on the *Cirri* of the LaHave Antedon; vide paper on the N. S. *Echinodermata*, *Trans.*; on Boulders, Nullipores and Algæ. Vide paper "On Glacial Boulders of the Fishing Banks," *Trans.*, and other papers read before the Institute.

PARAZOA—*Spongida.*

On Cable I, we have three sponges. These were found in the "hempen debris." They are MONAXONIDA. The first that we found was attached to a *Bryozon*. It is a thin undiscrivable sponge of brown colour. We have found several detached. Its spicules are *ac*<sup>2</sup>, oxeas of various form and size. We give names to this and others which may be provisional. Our sponges are so numerous that we require this for *our own use*. This is *Reniera escharæ*. A second sponge, of which we have a number of specimens, or parts of specimens, is distinguishable from the other, but also indiscrivable. Of this the spicules are *ac*<sup>2</sup> and *trac*, styles, the latter are of small size, and straight or bent

The former are of various forms—straight, bent, stout, slender. We name this *Reniera Minia*. A *third* is a small oval-shaped sponge, distinguishable from the two preceding, but not describable, so as to be recognised by others. The spicules of this are *trac*, styles and *anc*<sup>2</sup>, bianchorate or bihamate, large, middle and small. It is a *Myxilla*. We give it a specific name—*Greeri*. Dr. Greer is the doctor of the “*Minia*.”

The sponges of Cable II do not require hunting up with the magnifying glass. We have four pieces of this cable, each 2½ feet in length, densely coated with them, so as to astonish with the growth, and a large “*tubful*” besides.

The sponges of Cable II, in the Bay of Fundy, are *Reniera duxburyensis*, *Reniera fundyensis*, *Reniera collincoli*, *Myxilla Minia*.

The two first are the prominent ones. *R. fundyensis* is firmly rooted to the coating of the cable. *R. duxburyensis* covers the coating and encloses the other. The latter then branches above it, the two forming a dense thicket. Here and there *R. collincoli* forms a series of hillocks, with oscula on the tops. *Myxilla Minia* is found attached to the Hydroid, Campanalaria. The oscula of this are not much unlike the pores. This is a characteristic of our *Myxilla* in general. The oscula of *R. fundyensis* are distinct, small, and numerous, the figures being *pitted* with them. Of *duxburyensis* the oscula are large and wide apart. The *spiculation* of *Reniera fundyensis* is *complex*. It has this character in common with *Reniera Minia* of Cable I. I would also observe that the sponges of both cables have *diatomacea* of considerable variety and beauty. These of Cable II have also *radiolaria*. We defer further remarks on these to our paper on *Spongiadae*.

*Hydroida* have a luxuriant growth on both cables. We do not attempt the description of these. They have done good service in securing many specimens which would otherwise have been wanting.

There are *Aleyonida* on both cables. These are of a kind that attach themselves to other objects, and hence we have them

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NOTE.—We hope to give plates with Camera lucida figures of the spicules, &c., of *R. fundyensis*.

attached to our cables. We consider both to be *Cornularinæ*. Danielssen thus describes one: "The *Zoanthodem* has no stem; the basal part is thin and semi-transparent, and it extends itself in bands over the objects to which it is attached. Isolated polyps, with their cells, stand up from the basal part, having larger or smaller intervals between them." Two specimens are described as *new species* and illustrated by plates.

We had not consulted the work to which we refer—*Alcyonidiæ*, of the Norwegian North Atlantic Expedition—until we had examined and re-examined histologically, our "First Cable" specimen. We had its beautiful spicules under the microscope when we received a new Report of the same Expedition. On opening it at random we were surprised to see *plates* representing the spicules before us, as we at first sight supposed.

In the memoir and plates by Greig we found two new species of *Cornularinæ* very much like our own. On closer examination we found the basal part of *Sympodium margaretaceum* to be like our own, but the polyps different, and also our spicules much different and apparently new. We therefore give it the *provisional* name—*Sympodium Griegii*. On the second cable we find another of a form decidedly different seated in the sponge *Reniera duxburyensis* and attached by its base to the coating of the cable. We also suppose this to be a new species. The spicules are very much different. The polyps of both are shrunk and only external character and spicules are available for examination. We would name this *Sympodium* (?) *Danielsseni*.

Our introduction to the First Cable Collection was thus: Mr. Hamilton, the Electrician of the *Minia*, meeting me on the street, informed me that he had something like a bamboo from the bottom of the ocean. Curiosity quickly led me to his room on board of the ship. When I was shewn the specimen I recognized an old acquaintance of the I. F. E., Canadian Department, which came from British Columbia with the name *Verrillia Blakei*. It was an attaché of the cable. Being told that Capt. Trott had other specimens, I went to his cabin to see them, and became the fortunate possessor of them all. Among the illustrations of the "Blake Expedition Bulletin," I further recognised

the British Columbia specimens in the *Balticina finmarchica* of Koren and Danielssen, and its axis.

Our *Balticina* is certainly identical. The general aspect is the same, and so is the axis. The latter is exposed at the club-shaped end, and at the upper extremity it is bare, a length of *one and six-tenths* of an inch. The arrangement of polyp cells is the same—a farther length of *five inches*. They are confused and irregular, being injured—a length of *six inches*. They are then regular, but small—a farther length of *five and six-tenths* of an inch. This reaches to about *six inches* from the lower extremity. The spicules of one of the largest cells are long and short, fusiform, with longitudinal corrugations and colourless. The whole length is 24.2 inches. It must have been very prominent on the cable.

It is to be regretted that so small a portion of the organic material of the cable has been preserved. It was in great quantity. The rest was thrown overboard.

#### ANNULOIDA.

Of the Sub-kingdom IV we have also interesting representations. First—*Crinoidea*. *Comatula*, or *Antedon*. This is on Cable I. We have not found any on Cable II. We have one, however, which might be regarded as an equivalent. Sir C. Wyville Thomson presented to the Museum the specimens of a *Comatula* which he dredged on LaHave Banks; not far from the cable, and at a depth of 75 fathoms. We do not know the name given to it by the "Challenger Reporter." It is possibly *Antedon Eschrichtii*. We have three specimens of our Cable *Antedon*. They were found entangled among the *Campanularia* and are very much broken. We seem to have all the fragments, so as to be able to form a pretty correct idea of its character and appearance. We compare it with the larger species. The girth of the folded arms of the larger near the body is 30 m. m. Of the smaller 8 m. m. The dorsal *cirri* of both are perfect, generally, and are evidently characteristic. Those of our tiny Cable *Antedon* can only be properly examined by the *one and a half* inch objective of our microscope. They are pearly, translucent,

The terminal claws are double. The number of joints is 20. These are fringed on the lower ends with minute spines, larger and smaller. The claws of the LaHave *Antedon cirri* are single. The number of joints is 37 and upward. They have no spines. They are yellow and opaque. We have another *Antedon* from another part of the same cable. The size of this is evidently intermediate. Its cirri have also double claws. They are also *spinous*—more strongly than our other. The number of joints is greater than of the other two. We have counted 55. Regarding our little *Antedon* as a new species we have named it *Antedon moræ*.

Of Order OPHIUROIDEA—Fam. *Ophiuridea*—we have specimens on both Cables. On Cable II we have *Ophioglypha* sp. These also abound on the "Glacial Boulders" of the Halifax Fishing Banks. *Vide* paper in Transactions preceding. They are strong in constitution and have the *normal* number of rays—*five*.

On Cable I the *Ophiura* is beautiful, delicate, white, with glassy spines, almost like spicules of sponges. This has *six* rays, an *abnormal* number. After a diligent search among authorities we have been able to find only one six-rayed ophiuran—in the Report of the Challenger, where it is described and figured and named as *unique*. In Vol. OPHIURIDA, plate 47, fig. 1, is *Ophioglypha hexactis*, of Kerguelen Island, 20 to 75 fathoms, and Marion Island, 50 to 75 fathoms. It would be rather too much to expect our ophiuran, with so much difference of distance and depth, to be the same species. Except in the number of rays they are altogether unlike. Without interfering with the name of the other we would in the meantime assume the *Family* name, and distinguish ours as *Ophiura annæ*. Our specimen is much injured. The body is perfect; all the rays are well represented; one is almost complete and there is no difficulty in finding a terminal part to complete it. The joints and spines of the other rays are plentiful in the hempen *debris*.

In this *debris* we have also found two specimens belonging to *Order Echinoidea*.

1st.—A tiny test of an Echinus, without the spines. The oral

apparatus and plates, and anal and genital plates are wanting. It is 7 m. m. in diameter; the height is a little more than 3 m. m.

2nd.—Detached plates of another. The spines are mixed with those of our *Ophiura*. We have separated a few of them as microscopic objects. In a cavity of one of our boulders we found a perfect *Echinus* of about the same dimensions as the preceding.

SUB-KINGDOM IV. *Annulosa* is well represented on our Cables.

*Annelida*—ORD. Tubicolæ.

On Cable I we have 1st—*spirorbes* attached to Hydroids. 2nd—Two long coiled leathery tubes; one of these is about a foot in length. 3rd.—Agglutinated tubes composed largely of grains of sand and tests of *foramenifera*. They were all without tenants. We can only conjecture their character. *Diopatra glutinatrix* may have occupied the last, as our portion of the Cable lies in the zone of their greatest abundance. *Vide* Bulletin of the Blake Expedition. We have not yet found *Tubicolæ* on the second Cable. *Spirorbes* and serpulæ are sufficiently abundant on our "Boulders." *Vide* a preceding paper.

The next Order is well represented on Cable I. They also occur, but less numerous on Cable II. These are "sea centipeds." That of Cable II resembles the *low water* species of our Harbour. That of Cable I is much different. Our *low water* species are tough and easily handled. It is scarcely possible to turn or otherwise handle the worms of the first Cable without breaking them. So that all our specimens are fragments, with one or two exceptions, and even these are not perfect. I may here make the remark that with the exceptions, *Hydroida* and *Balticina*, all are tender and fragile, and have to be handled with the greatest care.

The length of the first Cable annelid is 48 m. m.

The head is small; on the top are two pairs of ocelli (black spots.) The mouth is in front and is circular; above it are tentacles which seldom appear. The *spatulate* termination is 6 m. m. and 4 m. m. length in two specimens. The *anus* is at the end of

this. Under the microscope the spatula has fine cross lines. The parapodia are bunches of bristles. They have a brilliancy in sunshine like those of *Aphrodite*. These bristles under the microscope are very beautiful. Some are doubly serrated and ensiform, others are long narrow cones without serratures and sharply pointed. On our microscopic slides are detached ones. We have one of our best specimens, which we allowed to dry in sunshine, on a glass slide. Observing it with the  $1\frac{1}{2}$  in. objective the sight was interesting. Bristles made their appearance in front—two conical and sharp pointed ones—so as to have the appearance of two horns. The whole body became translucent, showing the imbedded parts of the bristles, on either side almost meeting in the middle of the body. The bristles of the parapodia are in this specimen directed forward. We have it enclosed in dried Canada Balsam. Another specimen, head and part of the body, was prepared in the same way. In this one of the pointed conical, bristles at the front, is *fractured*.

Yet another specimen was laid on its back and dried in a similar manner. This shewed a formidable front with 6 projecting bristle points. The *parapodia* terminate at the top of the "spatula." We have not been able to recognize our annelid in any other, actual or figured. We give it the *provisional name Ewnicea? Trotti*. We will now look at its work. There are four pieces of the Cable before us. 1st, is intact. 2nd, shews the iron wire, with the hemp between. There are numerous holes in the hemp—burrows of *E. Trotti*. 3rd and 4th, shows the gutta percha insulator pitted all over, but not deeply. These are the evident ends of the burrows. The frontal bristles of the annelid may have made the pits and one of them suffered in consequence. Our specimens of the annelid were taken from the hemp. One is still partially enclosed in it.

#### ARTHROPODA.

Our next are *Arthropoda*, Class 1st, *Crustacea*, Sub-Class *Cirripedia, Balanoid*. Among the debris of Cable I, we found parts of the shell of a *balanus*.



On Cable II they are abundant—small and large. The base or head of some is 1 inch in diameter.

MALACOSTRACA—Order *Lemadipodia*.

CAPRELLA, sp. We have already noticed this fantastic little Crustacean on Lawson Boulder. (A.) *Vide* Paper "Glacial Boulders," &c., Trans. I. N. S. On Cable II they abound. We have found them among the *Hydroïda*, where they had been evidently feasting. They are of various sizes, some very small. We regard all as one species. All that we now note regarding them is: Under the microscope they are plain, without spines, and have small *red eyes*. They are male and female. We would name it *Caprella Sarsii*. On Cable I, we found among the *Hydroïda* three complete specimens of another species. These have a long spine on the back of the head curved backward, and two on the back, opposite the *Chelæ*, curved forward; also granulation. *These are blind*. They are, one male and two females. We would give this the provisional name—*Caprella trispinis*.

On this Cable we found 9 specimens of a *Podocerus*. The feelers are in length equal to the body—5 m. m. each. The telson is 1 m. m.; total length 11 m. m. Some of them have *eye spots*.

MOLLUSCOIDA. Among the hempen debris of Cable I, we found Bryozoa. One had a sponge, *Reniera escharae*, attached to it; others were free. On Cable II Bryozoa abound. Some of them are very beautiful; they are calcareous. Elsewhere we have designated them "Corallines." They also occur abundantly with the *corneous bryozoa* on our Boulders, and *Boltenia clavata*, large and small, in abundance.

Among the debris of Cable I we have found MOLLUSCA—three small saxicava.

On Cable II, old and young species occur frequently.

In the debris of Cable I, we found a small *anomia*, and three specimens of a tiny *arca* of different sizes. Measurement of the largest—width 8 m. m.

Height 6 m. m.

Hinge line, straight length 6 m. m.

Teeth very small and numerous, umbones *prominent*.

Epidermis *hairy*.

Considering it to be new, we name it *Arca ninæ*.

There is also a very minute pearly circular bivalve, *inc. gen.*

There was a large number of specimens of a beautiful *Pecten*. These are transparent and pearly. The molluscs are seen through the shell. The outer edge and the growth lines have round tubercles occurring at frequent intervals. The small shells resemble fish scales, and can only be searched up with a magnifying glass. Measurement of largest — width, 25 m. m.; height, 20 m. m.; hinge, 14 m. m. Supposing it to be new we name it *Pecten Hicksii*. On Cable II there is also a *Pecten* and valve of small anomia.

GASTEROPODA.

We have two perfect specimens of *Trichotropis*.

Measurement of largest—mouth, 12 m. m. x 10 m. m.

Height, 10 m. m.

*No opercle.*

Tongue exposed.

Epidermis hairy; mouth and lines of growth fringed with hair.

It is unlike *Trichotropis borealis*, as figured by Gould. We give it a provisional name—*Trichotropis Hamiltonensis*.

Attached to the cable and having its impression, was a beautiful round group of mollusc egg capsules. There is little doubt that they are connected with this gasteropod. Among the hempen debris we found a large number of similar egg capsules empty, and also a number of shells of *trichotropis* of various sizes; some very small.

PISCES.

In the debris of Cable I we also found a *fish scale* of peculiar structure. Is it of a *deep sea* fish?

SUMMARY OF FAUNAS.

CABLE I.

CABLE II.

I.

SUB-KINGDOM.

PROTOZOA.

1 Foramenifera.

Orbulina universa.	Sessile, 2 sp.
Globigerina bulloides.	
Nodosaria.	

2 Radiolaria.

2 species.	2 species.
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PARAZOA.

Sponges.

*Reniera Miniaë.	*Reniera Fundyensis.
R. escharæ.	R. Duxburyensis.
Myxilla Greerii.	R. collincoli.
	Myxilla Miniaë.

II.

CŒLEENTERATA.

Hydroida.

Campanularia.	Campanularia.
	Sertularida.

Alcyonida.

Symphodium Griegii.	Symphodium ? Danielsseni.
Balticina Finmarchica.	

III.

ANNULOIDA.

Crinoidea.

Antedon moræ.

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NOTE.—The two Cable Sponges, Reniera Miniaë and Reniera Fundyensis, are illustrated by two plates, with figures, drawn by the Camera Lucida.

CABLE I.

Ophiura annæ.  
(6 rays.)

Echinus, sp.  
(Small.)

Spirorbes, sp.  
Leathery tubes.  
Diopatra glutinatrix? tubes.

Eunicea? Trottili.

Balanus.  
Caprella trispinis.  
*Male and female.*  
Podocerus? Newtoni.

Bryozoa.  
Coralline.

CABLE II.

Ophiuroidea.

Ophioglypha, sp?  
(5 rays.)

Echinoidea.

IV.

ANNULOSA.

Tubicola.

Errantia.

Crustacea.

Balani.  
Caprella Sarsii.  
*Male and female.*

V.

MOLLUSCA.

1 Molluscoida.

Polyzoa.

Bryozoa.  
Coralline.

Tunicata.

Boltenea clavata.

CABLE I.

CABLE II.

Mollusca.

Conchifera.

*Saxicava Rugosa*.

*Saxicava Rugosa*.

*Corbula* ?

*Tellina* ?

*Arca Ninæ*.

*Pecten Hicksii*.

*Mytilus edulis*.

*Anomia* sp.

*Pecten* sp.

*Anomia* sp.

Gasteropoda.

*Trichotropis Hamiltonenses*.

Nidamental capsules.

Pisces.

Fish scale.

Protophyta.

*Diatoma vulgare*.

*Diatoma vulgare*.

*Coscinodiscus*.

*Coscinodiscus*.

*Bacteriastrum furcatum*.

*Pinnularia*, &c.