

no uncommon occurrence for the anchors of the nets of a " seal-fishery " on the north shore of the Gulf of St. Lawrence to be frozen to the bottom at the depth of from thirty to sixty feet ; and when anchors are then raised, they bring with them frozen masses of sand. But it is in rapid rivers that the formation of anchor-ice is most remarkable, and most effective in excavating these beds. It forms on the beds of rivers above the head of a rapid, and frequently bursts up with a load of frozen mud or shingle, or slabs of rocks, which it has torn from the bottom. This phenomenon is witnessed every winter in the valley of the St. Lawrence ; but it is best observed after a prolonged term of cold, when the thermometer indicates a temperature considerably below zero. Anchor-ice has only been observed, as far as my knowledge of the subject goes, in rapid currents in open water ; and the sudden and apparently inexplicable rise of the St. Lawrence during extreme cold is most probably due to this cause.\* It is not difficult to see how the rivers issuing from beneath the precipitous walls of glaciers, as described by Dr. Rink, may rapidly excavate deep channels by means of anchor-ice, to be widened by the subsequent operations of the glacier itself. Nor is it improbable that by this means a glacier in very cold climates may increase from the bottom upwards with a load of frozen mud and fragments of rock, particularly near its base, when that does not meet the open sea. The great lakes of North America, including Lake Winnipeg, are excavated on the edges of the fossiliferous rock-basins ; and these lakes may represent the boundary of a glacial mass similar to that which now covers Greenland.—*From the Journal of the Geological Society.*

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## DESCRIPTION OF TWO AMERICAN SPONGES.

BY DR. J. S. BOWERBANK, F.R.S., &C.

### 1. *Tethea hispida*, Bowerbank.

Sponge sessile. Surface strongly and thickly hispid. Oscula and pores inconspicuous ? Dermis abundantly spiculous ; spicula disposed at right angles to the surface, uniformly crowded together ; super-fusiformi, sub-ovo-spinulate, very minute ; forming a secondary series of defensive spicula. Primary series of defensive spicula super-fusiformi-acuate or sub-ovo-spinulate, very large and long. Skeleton spicula super-fusiformi-acuate and sub-

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\* See "Notes on Anchor-Ice," by T. C. Keefer, C.E., Canadian Journal, new series, vol. vii, p. 173, (1862).

ovo-spinulate, large and long. Tension spicula super-fusiformi sub-ovo-spinulate, small, irregularly dispersed, numerous.

Color. Dried, light gray.

Habitat. Portland, Maine, N. America.

Dr. Dawson, McGill College, Montreal :

Examined in the dried state.

I received a small slice of this sponge from Prof. Dawson. From the curve of the surface the specimen appears to have been about an inch and a half in diameter. In its present state the hispidation of the surface is very strongly produced, and probably much exaggerated by drying; the spicula are comparatively very large and long, more so than those of the skeleton fasciculi. The secondary series of defensive spicula are of the same form as those of the interstitial membranes, but not more than half their average size. The whole of the spicula are exceedingly fusiform, the middle of the shaft being frequently twice the diameter of the base of the spiculum. The ovo-spinulate character prevails more or less in all the spicula, but is more distinctly produced in those of the interstitial membranes, and the secondary dermal defensive ones. I could not detect any gemmules in the piece of sponge sent to me.

## 2. *Spongilla Dawsoni*, Bowerbank.

Sponge sessile?, branching; surface smooth. Oscula and pores inconspicuous. Dermal and interstitial membranes abundantly spiculous; spicula fusiformi-acerate, entirely spined; spines numerous, short, and conical. Skeleton-spicula acerate or subfusiform-acerate. Ovaria spherical; dermal spicula numerous, disposed in flat fasciculi, or groups of spicula parallel to each other; groups irregularly dispersed; spicula acerate or subcylindrical, entirely spined; spines numerous, obtuse, and ill-defined. Sarcode aspiculous.

Color, in the dried state, emerald-green.

*Hab.* River St. Lawrence, Montreal, Canada (*Mr. Fowler*, and *Rev. A. Kemp*); a lake near Brockville (*Rev. A. Kemp*).

Examined in the dried state.

About two years ago I received a small fragment of this species from Dr. Dawson, who stated that it was found in the River St. Lawrence, at Montreal; but, as the fragment was destitute of gemmules and very small, there were not sufficient characters to warrant a specific description of it. In October 1859 I received

from the same gentleman a further supply of fragments of this species, containing ovaria, and giving a better idea of its form than those first sent to me. The largest of the pieces sent was  $1\frac{1}{2}$  inch in length and  $2\frac{1}{2}$  lines in diameter, evidently a portion of a longer branch. At the proximal end there is a short branch, 3 lines in length and one line in diameter; and the distal end divides into two small branches of similar dimensions to the first, thus satisfactorily indicating the branching habit of the species. In several parts of this piece there are ovaries imbedded in the sponge, and there were many others in the fragments of the same species that accompanied it. The general external characters appear very like those of the European species *S. lacustris*; and from this similarity, I have very little doubt of its surface in the living state having been smooth and even, as in that species. In the European species the branches spring from a broad spreading base, about half an inch in thickness; and I think it highly probable that the American species will be found to possess the same habit. I could not detect oscula on any of the fragments in my possession.

The dermal and interstitial membranes abound with tension-spicula, and especially the dermal one, in which they seem to attain their fullest degree of development. Their normal form is fusiformi-acerate; but, from the abundant production of the spines at their terminations, they frequently appear to be cylindrical rather than acerate. They are dispersed on these tissues rather unevenly, abounding in some spots, while they are comparatively scarce in others.

The spicula of the skeleton are of about the same proportions as those of the European species. They are usually of the regular acerate form, but occasionally become subfusiform.

The spicula and their mode of arrangement in the dermis of the ovarium cannot be readily seen without the aid of treatment with hot nitric acid, in which they should be immersed for a few seconds, and the acid should then be immediately diluted with water, after which they should be dried on the glass, on which they are to be mounted in Canada balsam. The spicula in the dermis of adult ovaries are very abundant. They are similar in form and proportions to those of the dermal membrane; but, generally speaking, they are more fully produced, and the greater portion of them are subcylindrical from the profusion of spines at their apices. Their form and mode of arrangement in the ovary render

them exceedingly valuable as specific characters. In some of the young and incompletely developed ovaries I could not detect a single specimen of these spicula. The only difference I could find between these spicula and those of the dermal membrane was, that the spines on those of the latter were more sharply and fully produced, while on those of the ovary they were frequently ill-defined and often only in an incipient state, but very abundant.

In the preparation of the spicula for examination, I found a few birotulate ones having the rotulæ very deeply divided. These spicula were no part of the sponge in course of description, but were undoubtedly from the gemmules of another species inhabiting the St. Lawrence.

(NOTE BY THE EDITORS.) The above descriptions may be taken as a first instalment of descriptions of Canadian and other American Sponges, now in the hands of Dr. Bowerbank. The first was forwarded to us in MS. by the author. The second is taken from a late paper in the Proceedings of the Zoological Society of London.

The first of the above species was dredged by Dr. Dawson at Portland. The original specimen, part of which was sent to Dr. Bowerbank, is of an oval form, an inch and a half in its longest diameter, and about a quarter of an inch thick in the centre. It is attached partly to a stone, and partly to the side of a large specimen of *Balanus porcatus*.

The second species was collected by Mr. Fowler and Rev. Mr. Kemp, and the specimens were presented by these gentlemen to the Museum of McGill University, whence the portions examined by Dr. Bowerbank were sent with a number of others by Dr. Dawson.

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#### MISCELLANEOUS.

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HAIL-STORM IN PONTIAC.—*Extract of a Letter from Wm. King, Esq., of Bristol.*—Two days ago a very destructive hail storm occurred in this and the neighboring townships. Some singular circumstances connected with it may be noteworthy. On Monday, the 11th, about two p.m., the storm came, accompanied by thunder and lightning. Its course was from west to east, and about two miles wide. Almost all the glass in the westerly windows of the farm-houses within its range was broken; the crops of wheat, in