

TRANSACTIONS
OF THE
Nova Scotian Institute of Science.

SESSION OF 1891-92.

I.—NOTES ON CONCRETIONARY STRUCTURE IN VARIOUS ROCK FORMATIONS IN CANADA.—BY T. C. WESTON, OF THE GEOLOGICAL SURVEY OF CANADA.*

(Read Nov. 9th, 1891.)

MANY times between the years 1860-70 the late Sir Wm. E. Logan, and subsequently Dr. Selwyn, called my attention to certain concretionary forms found in the gold-bearing rocks of Nova Scotia. Some of these seemed to be organic, and I was requested to make and examine microscopic sections of them. In treating several of these with acid, they proved to be composed chiefly of dolomite, with a large proportion of siliceous matter, and generally a little iron pyrites, which formed a nucleus.

In 1890 a number of similar forms were found by Mr. Willis in the rocks of the Northup Gold mines, Rawdon, Nova Scotia. They were handed to Professor Hind, who supposed them to be fossils, and assigned them to Lower Silurian age. Wishing the "judgment of a specialist," he gave them to Professor Kennedy, of King's College, who confirmed Professor Hind's opinion and pronounced the fossils to be *Stromatopora*. Mr. Fletcher and Mr. Faribault, of the Geological Survey, while in the vicinity

* Communicated by permission of the Director of the Geological Survey of Canada.

where this discovery was made, visited the mines, and brought away a number of these so-called fossils. They were given to me by Dr. Selwyn, director of the Dominion Geological Survey, for microscopic examination; and, I regret to say, the result is precisely the same as for those examined thirty years ago.

They appear to be composed of dolomite, and, when dissolved in hydrochloric acid, leave a good percentage of insoluble matter, probably felspar and silica. It is likely that they were spheroidal or ovoidal in form before being flattened by the pressure of overlying beds. One of the specimens before me is a piece of greenish-grey laminated mica-schist five inches long and one inch thick. Inclosed in this are four of these concretionary forms broken through the centre, each measuring one inch in length and half an inch in breadth. Two of these are connected with each other by a thin strip of the material of which they are composed.



DOLOMITIC CONCRETIONS IN GOLD-BEARING ROCKS OF NOVA SCOTIA.

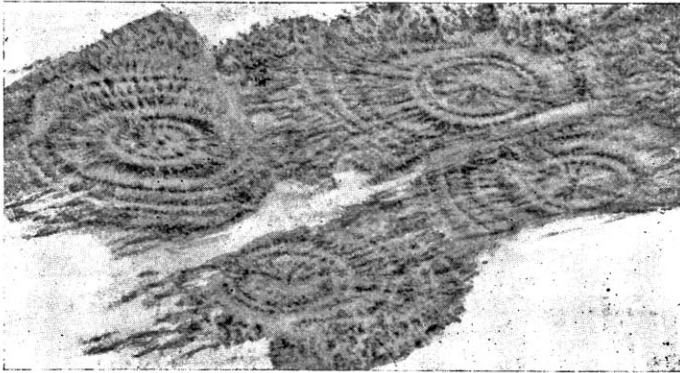
In broken sections some of these bodies show slight concentric layers which in microscopic sections are not seen. Not a trace of organic structure was found.

I quite agree with Professors Hind and Kennedy as to the importance of finding fossils in the auriferous rocks of Nova Scotia, and trust they have been more fortunate than I.

It is well known that concretions occur in all rock formations. One or two instances will be worth recording to show how care-

ful one should be in referring any forms of a concretionary nature to organic structure.

About the year 1863, forms with a decided concretionary aspect were found in the Huronian rocks of St. John's, Newfoundland. (The label on the specimen now in the geological museum, Ottawa, gives the exact locality, but not the date.) They were at once pronounced to be fossils, and even referred to the genus *Oldhamia*, having a slight resemblance to *O. radiata* of the Cambrian rocks of Ireland. A number of pieces of green argillite with these markings were sent to Sir Wm. Logan for examination. I was instructed to slice and examine them with the microscope, but before doing so ventured to tell Sir William that they were only concretions, and that, moreover, they lay transverse to the bedding of the rock. He was much vexed and showed a long paragraph about them which had appeared in one of the Newfoundland papers. Much to the disappointment of the discoverer of these supposed wonderful fossils, they were only concretions.



CONCRETIONS IN HURONIAN ROCKS OF NEWFOUNDLAND.

Similar forms can be seen in the Potsdam rocks on the coast of Labrador, and in the red slates and argillites on some of the small islands in the St. Lawrence River.

In 1870 Dr. Selwyn found in the grey auriferous slates at the Ovens Bluffs in Lunenburg County, Nova Scotia, certain fucoidal markings which Mr. Billings, palæontologist to the Geological Survey, regarded as belonging to the genus *Eophyton* (Geological



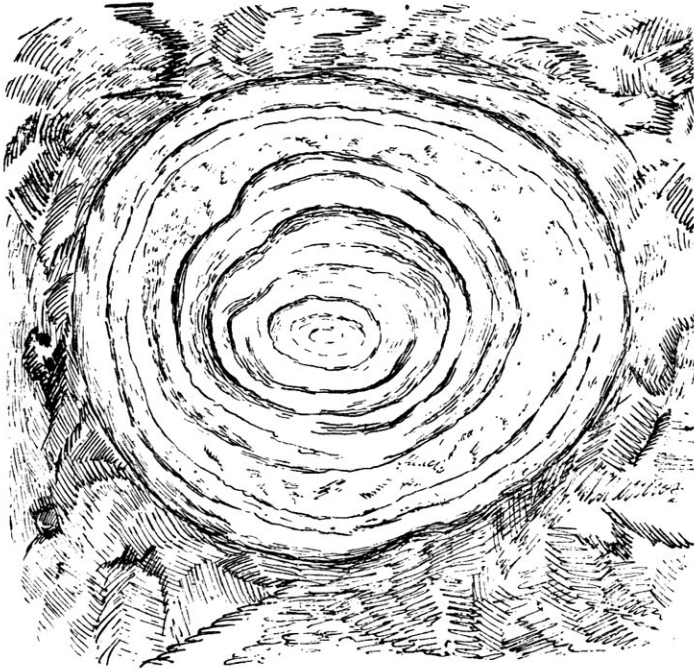
TREE-LIKE CONCRETIONS AT KINGSTON, ONT.

Survey Report, 1870-71, page 269). Mr. G. F. Matthew describes similar markings from the Cambrian rocks of St. John, N. B., as being produced by some animal (Trans. Roy. Soc. Canada, Vol. III., page 150). The Ovens specimens he refers doubtfully to the genus *Otenichnites*. But, whether they are plants or tracks,

it is an interesting discovery which should urge those working among the gold-bearing slates of Nova Scotia to a diligent search for organic forms.

At Dr. Selwyn's request, the writer spent several weeks among the gold-bearing slates of St. Mary River, the Ovens, and other localities in Nova Scotia. At Cape St. Mary, concretionary forms such as those from the Northup mines, only very much flattened, some to the eighth of an inch in thickness, were seen. Many were broken open and carefully examined, but no trace of organic structure was found.

In the Cambrian sandstones (Potsdam), on the banks of the Rideau Canal, near Kingston, Ont., large cylindrical trunk-like



SECTION OF WEATHERED SPECIMEN.

concretions stand erect transverse to the bedding of the deposit. Some of these are from ten to twenty feet in height. (See figure, p. 140.) Dr. Selwyn visited these so-called fossil trees, and

caused a section of one four feet in diameter to be sent to the museum in Ottawa.

The writer also saw these singular bodies, and assisted in getting good photographs of them. Weathered transverse sections show well-defined concentric rings of various colors, measuring from the eighth of an inch to three inches in thickness, but there are no radial lines. (See figure, p. 141.) The people in the vicinity of the quarries where these trunk-like forms are found were much disappointed when told by Dr. Selwyn that they were only concretions.

On the other hand, many of the fossils found in the Chazy and Trenton formations of Ottawa were at one time supposed to be concretions, but are now known to belong to the family of the *Monticuliporidae* (Micro-Palæontology, by Arthur H. Foord, page 24, plate VI.). It is, therefore, important that all such nodular or concretionary-looking forms from the auriferous slates of Nova Scotia should be microscopically examined before coming to the conclusion that they are organic remains, and especially before assigning names to what on thorough examination turns out to be of inorganic origin.