

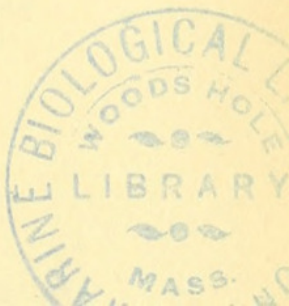
## XX. A TRIP TO ISLANDS IN LAKE ERIE.

BY CALVIN GOODRICH.

Some of the older American collections contain land-shells of peculiar form and pattern, the locality for which is given as "Strontian Island, Lake Erie." There is reference to the island in Binney & Bland, page 153, and in Binney's *Manual*, pages 480 and 492.

Mr. George H. Clapp, failing to find Strontian Island on available maps, wrote me in the winter of 1914-15 for information regarding it, suggesting that it might be a local name, which had failed to get recognition from the official chart-makers and, that, as I lived in the region, I might know, or might learn, what the true name was. It happened that I could give the information. The correspondence led to a proposal for a visit to Strontian Island, now Green Island, as well as for the exploration of other bodies of land in the lake. Dr. Bryant Walker was sounded and he gladly agreed to become a third member of the expedition. Mr. Lucas Beecher of Toledo volunteered as "navigating officer", and the powerboat "La France," Captain Woodruff, was chartered.

The party left Toledo the afternoon of July 2, 1915, and made West Sister Island at twilight, collecting being deferred until the next morning. The island is inhabited only by the lightkeeper, his wife, and a helper. In the sixty and more years during which the light has been maintained, the island has been grazed over by many generations of cows and fed over by untold flocks of chickens and turkeys. On our visit we scared numbers of Belgian hares from the undergrowth. West Sister must have had an enormous molluscan population at one time, as the "bones" carpeted the ground. But snails are now very scarce, being confined mostly to "small stuff" and to two or three of the larger species, which, living under the bigger logs or deep in the humus, have escaped extinction. There is even a noticeable decrease since a visit I made to the island in 1913. Our collecting here, as well as our breathing and eating, was made difficult by the *Ephemeridæ*, then just past the climax of their swarming. West Sister is a jewel in a ring of sounding waves, but because of the May-flies we were glad to leave it.





An hour's run in a rising sea brought us to Green Island, once Strontian. We anchored in its lee and went ashore in the "dinky," a craft admirable for towing but something of a mistake for purposes of navigation. Landing, we entered almost immediately upon a paradise of snails. A slow rain was falling and the animals were making the most of it. They were everywhere—on timbers, weeds, in the grass, among the roots of trees, even on the concrete walk which led from the boat-house to the light. One could scarcely walk without treading on them. In one tangle of decaying weeds scores were taken. I collected about three hundred specimens, Mr. Walker as many, and Mr. Clapp many more. It was all a matter of reaching the point of satiation. There was no need to get off the "avenue" through which the walk ran. That there were so many here, while at West Sister there were so few, may be explained by the fact that on Green Island the chickens were confined, and there were apparently no cattle to clean out the underbrush.

In the afternoon we hurried on to Middle Island, confident of making another big haul. But we were booked for disappointment. Middle Island, belonging to Ontario, has a lighthouse, chickens, and turkeys. The snails, what there were of them, had to be quarried for. Most of them were under flat rocks on the north shore. The weather was steamy, the May-flies a nuisance.

The next day we came upon the rival of the Green Island snailery. It was Middle Sister Island, lying in Canadian waters at the western extreme of this island group. For a collecting receptacle, Mr. Clapp had chosen one of those cylindrical cans in which certain brands of biscuits are packed, declaring in advance that, in event of abundance, he would be temperate. But the can was soon filled and he was glad to borrow a bag. The snails were plentiful on low as well as on high ground, in the thick woods, and in the weeds within reach of the wash of northwest storms. They seemed particularly partial to the Herb Robert (*Geranium Robertianum*), a plant about ankle-high and very pungent when broken or bruised. The island has never been inhabited by man, except for short periods, in which professional fishermen assumed squatter rights. Fortunately for collectors they brought with them no chickens, at least living ones.

At noon we turned eastward again and made a landing on North Harbor Island. It was a rookery for terns, and it was necessary to watch every step to avoid treading on eggs and nestlings. The haul



here, though it would have been fair for mainland collecting, seemed insignificant after Middle Sister.

East Sister, close by, was a large island and had been cultivated in previous years. The picking was small, the gaps between snails long, and the *Ephemeridæ* a plague. We "did" one end of the island, the only promising part, and rowed back to the powerboat. We had planned to make Hen Island before dark and, if possible, one or both of the islets known as the Chickens. Halfway to Hen Island, a storm forced the revision of plans, a sudden change of course, and flight to shelter at Put-in-Bay. This proved to be one of the worst gales of the season and reluctantly on the fourth we gave up hope of visiting other islands, the aspect of which from the lake indicated habitation by snails. Some collecting was done at Put-in-Bay, but without turning up anything not represented in Mr. John A. Allen's list, recently published in the *Nautilus*. The shells here corresponded to those of the mainland and might tend to show that, as an island, Put-in-Bay is of more recent formation than the other islands.

The rocks of the islands we visited belong to the Silurian series known as Monroe. Where the exposure is on the water, the rocks are very much weathered. In some places they are cut and carved into picturesque caves. With geologists the islands are most distinguished for their glacial records. Upon nearly all of them are beautiful grooves and striæ, sculptured by the ice. One series of grooves on North Harbor Island was utilized extensively by the nesting terns.

The basin of Lake Erie was originally a shallow valley with free drainage. In the successive stages in which the ice wall retreated and lakes formed at its foot (Lakes Maumee, Whittlesey, Wayne, and Warren) what are now the Erie islands were covered with ice and water. In the Lake Algonquin stage, in which the upper lakes discharged through three outlets instead of one as at present (if the the artificial Chicago drainage canal be excepted) the lowlands between Lakes Huron and Erie were uncovered, Lake Erie fell to a level below that of to-day, and the islands appeared above the waters. For a time a few of them may have been parts of the principal land-mass. Probably the peopling of the islands with animal and vegetable life began at this period. Later, and after the final passing of the glacial ice, the Great Lakes passed into the Nipissing stage, the Chicago outlet was closed and an increased volume of water poured through Lake St. Clair and the Detroit river. Still higher water came when



a second outlet, that through the Ottawa river, closed. If new islands have been formed since, their island career has no relation to glacial history. They were formed simply through the agency of erosion.

We hope at some future date to pay a more leisurely visit to these islands and make a more thorough study of the geology and botany with the idea of getting additional light on their age, as this may indicate how long it takes a species, such as *Pyramidula solitaria*—which goes back to inter- if not pre-glacial time unchanged from its present typical form—to change to distinct, and strongly marked races, as on the islands.

For purposes of record, the findings at the different islands are here set down:

WEST SISTER ISLAND, OHIO.

<i>Polygra albolabris</i> (Say)	<i>Helicodiscus parallelus</i> (Say)
<i>profunda strontiana</i> Clapp.	<i>Punctum pygmaeum</i> (Draper)
<i>zaleta</i> (Binney)	<i>Bifidaria armifera</i> (Say)
<i>elevata</i> (Say)	<i>contracta</i> (Say)
<i>inflecta</i> (Say)	<i>holzingeri</i> Sterki.
<i>monodon fraterna</i> (Say)	<i>tappaniana</i> (Adams)
<i>Vitrea indentata</i> (Say)	<i>pentodon</i> (Say)
<i>Zonitoides arboreus</i> (Say)	<i>Vertigo milium</i> Giddings
<i>minusculus</i> (Binney)	<i>Vallonia pulchella</i> (Müller)
<i>Pyramidula solitaria</i> (Say)	<i>parvula</i> Sterki.
<i>alternata eriensis</i> Clapp.	<i>Carychium exiguum</i> Say.
<i>cronkhitei anthonyi</i> Pilsbry	

GREEN ISLAND, OHIO (FORMERLY STRONTIAN ISLAND).

<i>Polygyra profunda strontiana</i> Clapp
<i>zaleta</i> (Binney)
<i>inflecta</i> (Say)
<i>Pyramidula solitaria strontiana</i> Clapp.
<i>alternata eriensis</i> Clapp.
<i>Succinea avara</i> Say.

MIDDLE ISLAND, ONTARIO.

<i>Polygyra profunda</i> (Say)	<i>Zonitoides arboreus</i> (Say)
<i>zaleta</i> (Binney)	<i>minusculus</i> (Binney)
<i>palliata</i> (Say)	<i>Circinaria concava</i> (Say)
<i>fraudulenta</i> Pilsbry	<i>Bifidaria armifera</i> (Say)
<i>inflecta</i> (Say)	<i>contracta</i> (Say)
<i>monodon fraterna</i> (Say)	<i>corticaria</i> (Say)
<i>Pyramidula solitaria</i> Say	<i>Vallonia parvula</i> Sterki.
<i>solitaria roseo-apicata</i> Clapp.	<i>Succinea avara</i> Say.
<i>alternata</i> (Say)	



## MIDDLE SISTER ISLAND, ONTARIO.

<i>Polygyra albolabris goodrichi</i> Clapp.	<i>Helicodiscus parallelus</i> (Say)
<i>zaleta</i> (Binney)	<i>Circinaria concava</i> (Say)
<i>profunda strontiana</i> Clapp.	<i>Bifidaria contracta</i> (Say)
<i>thyroides</i> (Say)	<i>Succinea avara</i> (Say)
<i>inflecta</i> (Say)	
<i>fraudulenta</i> Pilsbry	
<i>Pyramidula solitaria strontiana</i> Clapp.	
<i>alternata eriensis</i> Clapp.	

## NORTH HARBOR ISLAND, ONTARIO.

<i>Polygyra albolabris goodrichi</i> Clapp.	<i>Pyramidula solitaria roseo-apicata</i> Clapp.
<i>profunda strontiana</i> Clapp.	<i>alternata eriensis</i> Clapp.
<i>inflecta</i> (Say)	<i>Circinaria concava</i> (Say)
<i>fraudulenta</i> Pilsbry	

## EAST SISTER ISLAND, ONTARIO.

<i>Polygyra zaleta</i> (Binney)	<i>Pyramidula solitaria roseo-apicata</i> Clapp.
<i>profunda</i> (Say)	<i>alternata</i> (Say)
<i>inflecta</i> (Say)	<i>Ariolimax campestris</i> (Binney)
<i>Vitrea hammonis electrina</i> (Gould)	<i>Succinea avara</i> Say.
<i>Zonitoides arboreus</i> (Say)	<i>Bifidaria contracta</i> (Say)
	<i>Vallonia parvula</i> Sterki var(?)

## MOUSE ISLAND, OHIO—VISITED IN 1912.

<i>Polygyra albolabris</i> (Say)	<i>Pyramidula solitaria mousensis</i> Clapp.
<i>profunda strontiana</i> Clapp.	<i>alternata</i> (Say)
<i>inflecta</i> (Say)	<i>Zonitoides arboreus</i> (Say)



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