

## GEOLOGICAL SURVEY OF CANADA.

## REPORT ON THE NORTH SHORE OF LAKE HURON.

To His Excellency the Right Honorable JAMES, Earl of ELGIN and KINCARDINE, K. T., Baron Bruce of Kinross and of Torry, one of Her Majesty's Most Honorable Privy Council, Governor General of British North America, and Captain-General and Governor-in-Chief in and over the Provinces of Canada, Nova Scotia, New Brunswick, and the Island of Prince Edward, and Vice Admiral of the same.

Montreal, 29th December, 1848.

MAY IT PLEASE YOUR EXCELLENCY:—

In proceeding with the Geological Survey of the Province during the season which has just terminated, it was my intention, after a further examination of the Eastern Townships and the country in general lying south of the St. Lawrence, between the Richelieu and Chaudière Rivers, in continuation of the previous summer's operations, to follow out the investigation of the rocks which run through the district in question in their prolongation to the Temisquata Road, and farther down the St. Lawrence if time should permit,—thus to join the work already done in Gaspé with that in more western parts of the Province; but having been given to understand that it would be desirable to effect, if possible, a visit to the North Shore of Lake Huron, on which several mining locations had been claimed of the Government, and a considerable capital expended by the various parties interested in them, in order to investigate the general nature of the mineral ground of the district, and ascertain facts to elucidate the probable productiveness of the mines of that part in particular in which the development of the metalliferous veins had been carried to the greatest extent, the months of July, August, and part of September, were devoted to these objects. Two months had been previously occupied in the Eastern Townships and the adjacent seigniories; and, having left an Assistant on the ground, on quitting this part of the Province for Lake Huron, with instructions to trace out, as far as possible, the distribution of certain rocks and useful minerals, and to collect specimens in illustration of them, the month of October and part of November after my return from Lake Huron, were spent in verifying various facts ascertained by him, and in further personal examinations in the same vicinity, continued until the increasing severity of the weather, and a fall of snow, gave intimation that it was expedient to discontinue field work for the season, and return to winter quarters.

My Assistant, Mr. Murray, in the early part of the season, devoted his attention to the examination of the coast of Lake Huron between Penetanguishene and Sandwich, and, having joined me on the North Shore, at the Bruce Mines, I had the benefit of his aid in a survey of the Rivers Thessalon and Mississagui. We ascended the former about twenty-five miles, coasting the shores of three lakes occurring on the distance, and the latter nearly forty miles, as well as seven miles of one of its tributaries

and four miles of another, in addition to two lakes on the Grande Batture Portage, emptied by this tributary, one of them five, and the other eight, miles long, with breadths of one and two miles. Mr. Murray subsequently examined about sixty miles of the Spanish River, with about fifteen miles of two of its tributaries, and also about fifteen miles of the lakes and stream flowing into Lake Huron, in the immediate vicinity of LaCloche; after which he visited the Wallace mine and various other parts on the coast and islands of the main lake, as he returned to Penetanguishene.

The several rivers, with their tributary streams and lakes, which have been mentioned, were not only geologically but geographically surveyed, the measurements being determined with the same expedition as on former occasions, by Rochon's micrometer telescope; and I would take this opportunity of stating as a farther evidence of the accuracy of the instrument when carefully used, that a topographical survey of the Mattawa, a tributary of the Ottawa, having been recently completed by Mr. D. Sinclair, for the Crown Land Department, the total distance (nearly thirty-four miles) as determined by the chain, does not, on a comparison of resulting maps, at all differ from the same as determined by micrometer on my exploration in 1845, while the details bear as striking a resemblance as can be expected from two surveys of the same ground by different persons, wherein points on the distant shores of lakes, being fixed by inter-sections, an eye sketch is given of intermediate parts.

After descending the Mississagui and separating from Mr. Murray, my attention was bestowed on an examination of the coast between that stream and Echo Lake (discharging into Lake George, on the River St. Mary,) a distance of about seventy miles; and pedestrian incursions were made at intervals from the coast into the interior, for distances not exceeding five miles. In addition to this, a very detailed examination of the Bruce mines, on the Cuthbertson location, was made. The various lodes, as far as known, with their branches and all the workings upon them, were carefully measured and mapped. About 1500 tons of copper ores lying on the surface were sampled after the Cornish mode; drill-holes were driven across the lodes in some places at intervals of two fathoms, and in others of three and five fathoms on the surface, in the shafts, and in the under ground levels for the purpose of *sludge sampling* the same, as it is termed; and fifty-five samples resulting from these operations, were forwarded to Montreal to be assayed by Mr. Hunt, who has since made an analysis of each