REPORT OF DR. T. STERRY HUNT. ON THE GOLD REGION OF NOVA SCOTIA

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649224210

Report of Dr. T. Sterry Hunt. on the gold region of Nova Scotia by Various

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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REPORT OF DR. T. STERRY HUNT. ON THE GOLD REGION OF NOVA SCOTIA

Trieste

GEOLOGICAL SURVEY OF CANADA.

SIR W. E. LOGAN, F.R.S., DIRECTOR.

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DR. T. STERRY HUNT, F.R.S.,

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GOLD REGION OF NOVA SCOTIA.

Printed by Order of the House of Commons.

OTTAWA:
1868.

HUNTER, ROSE & CO., PRINTERS,
OTTAWA, CANADA.

THE GOLD REGION OF NOVA SCOTIA.

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RETURN

To an Address of the House of Commons, dated 15th April, 1868; for Copies of Reports made by the Officers of the Geological Survey, with reference to the Gold Districts of Nova Scotia.

By Command.

HECTOR L. LANGEVIN,

Secretary of State.

DEPARTMENT OF THE SECRETARY OF STATE,

Ottawa, 5th May, 1868.

THE GOLD REGION OF NOVA SCOTIA.

REPORT

OF

DR. T. STERRY HUNT, F.R.S.,

ADDRESSED TO SIR W. E. LOGAN, LL.D., F.R.S., F.G.S., ETC., DIRECTOR OF THE GEOLOGICAL SURVEY OF CANADA.

MONTREAL, April 30, 1868.

SIR,—Early in the month of November last you were pleased to order me to proceed to Nova Scotia for the purpose of making some observations on the gold-bearing rocks of that Province, with the view of comparing them with those of other parts of the Dominion,* and also of obtaining such information as might be useful in the event of a Geological Survey of Nova Scotia itself. In this excursion I was accompanied by Mr. A. Michel, who had already and independently formed the plan of visiting the gold region of that Province, and of whose extensive knowledge in matters connected with gold-mining I was anxious to avail myself, My own stay in Nova Scotia was confined to about four weeks in the months of November and December, but as it seemed not improbable that a report on that region might be called for, it was deemed desirable to secure the services of Mr. Michel during another month, which he spent in the Province after my return. A report drawn up by him is before me, and will be made use of in the following pages.

*NOTE.—In this connection may be noticed the recent announcement by Prof. E. J. Chapman, of University College, Toronto, in a letter dated March 8, 1868, and published in the Toronto *Globe* and *Leader*. He has found gold in certain specimens of copper pyrites and galena, collected by himself from veins in the region of Black Bay, lying between Neepigon River and Thunder Bay, on Lake Superior. Carefully repeated assays by him of these ores yielded amounts of gold varying from 17 dwt. to 19 dwt., together with rather more than 2 oz. of silver to the ton. Some of the ores contained, besides, from eight to eleven per cent of copper, and one nearly one-half of its weight of lead.

These veins, as remarked by Prof. Chapman, belong to the Upper Copper-bearing rocks of Lake Superior, described as altered Silurian strata in the *Geology of Canada*, chapter V. By referring to that work, on page 76, where the veins of this series of rocks are described, it will be seen that the presence of small quantities of gold in one them, associated with silver, copper, and cobalt, is indicated. I detected gold with the silver from Prince's Mine, in 1848, as described in the Geological Report of that year, page 63, and in 1863, wrote as follows in the *Geology of Canada*, page 745 :—

"It has already been mentioned that the native silver from Prince's Mine contains small quantities of gold. The parallelism in age and mineral contents between the Upper Copper-bearing rocks of Lake Superior and the Quebec group of Eastern Canada, makes it not improbable that gold may one day be added to the list of the mineral riches of Lake Superior."

This anticipation, however, in no way detracts from the economic importance of Prof. Chapman's discovery.

GEOLOGY OF THE GOLD REGION.*

The principal sources of information about the geology and mineralogy of the Nova Scotia gold region are as follows: Dr. J. W. Dawson's *Acadian Geology*, published in 1855; a report of Mr. Henry Poole, dated January 31st, 1862; one by Mr. John Campbell, dated February 25th, of the same year, and a second, dated February, 1863, and accompanied with a geological section. These reports were published by the Provincial Government. In addition to these should be noticed the valuable reports of Prof. Benjamin Silliman, published in 1864; one on the Tangier district, and another on those of Waverley and Montague. To each of these is prefixed a sketch of the gold region, embodying a great amount of information with regard to its geology, mineralogy and economic importance. In the following introductory pages I shall make free use of the data furnished by the gentlemen just named, adding thereto such observations as I was able to make during my own short visit at a season of the year very unfavorable to examination. Farther researches will doubtless enable us to extend and, perhaps, to modify, in some particulars, the statements here made with regard to the geology of the region, which still presents many points requiring farther study. I must here call attention to a little work published within the last three months by Mr. John Lovell of this city, and entitled *A Practical Guide to the Gold Fields of Nova Scotia*, by Mr. Heatherington, now of Halifax. In it the author has brought together a great mass of information with regard to the history and present prospects of the gold region of Nova Scotia, together with important statistical tables, and an Appendix containing, among other things, the text of the present mining laws of Nova Scotia. He has also given copious extracts from the reports of Messrs. Poole and Campbell, together with a reduced copy of the geological section appended by the latter to his report of 1863. Mr. Heatherington commenced the publication, in January last, of a monthly journal called the *Mining Gazette*, and devoted to the mining interests of Nova Scotia.*

Although the *Acadian Geology* of Dr. Dawson was published in 1855,* some years before the discovery of gold, there will be found in its fifteenth chapter a somewhat detailed description of the coast district of Nova Scotia, which has since become famous as a gold region. This consists of a zone of ancient stratified rocks lying exposed between the overlying strata of the Carboniferous system on the north-west and the ocean on the south-east, and having a breadth of from thirty to fifty miles in the wider portions, which to the north-east is reduced to not over eight miles. This belt of rocks extends along the Atlantic coast for a distance of about 250 miles, from Cape Sable on the west to Cape Canseau on the east, and has a superficies of about 6,000 square miles. Its surface is generally low, rising, however, in some places, to about 500 feet above the sea, and is in great part rocky and barren, the powerful denuding agencies to which, in past times, it has been exposed, having, over a large portion of the area, removed the alluvial deposits with which it was once covered and left the upturned and worn edges of the strata bare, or covered only with boulders of quartzite or granitic rocks. A large portion of this region is still an unexplored wilderness, and some of the most important gold districts are in localities which, until the discovery of the precious metal, were unreclaimed forests, so that it is in every way probable

* A second and much enlarged edition of this work is now in press, and will shortly appear.

that farther explorations may detect many other districts not less important than those already known.

The rocks of this region consist chiefly of slates and quartzites; they are, however, cut in many places by intrusive granites, and in addition to these several small areas of gneissic rocks occur in different parts of the belt, but their true relations to the great mass of the strata are not yet clearly made out. Leaving these aside, the rocks which cover the principal part of the area under consideration, are, by Mr. Campbell, divided into a quartzite group, and a clay-slate group, the latter conformably overlying the quartzite, and the two constituting one gold-bearing series; the total measured thickness of these two divisions is, according to the same authority, nearly two miles; but the gold appears to be chiefly confined to the quartzite, and the lower portions of the clay slate division. The geological age of these rocks is uncertain; although comparatively little altered, they are without fossils, so far as yet known, and are very unlike the fossiliferous Upper Silurian and Devonian rocks met with in other parts of the Province; at the same time the high antiquity of the gold-bearing strata is shown by the fact that the Carboniferous system rests upon their upturned edges, and is partly formed from their ruins. In the present state of our knowledge it appears probable that they may represent a part of the Lower Silurian series, which, like the Upper Silurian and Devonian of this part of the continent, may be supposed to consist chiefly of non-calcareous sediments.

The rocks of the gold series are affected by undulations running nearly east and west, which have raised the strata to high angles, often approaching the vertical. According to Mr. Campbell there are not less than six principal anticlinals exhibited on a transverse line of section, extending from the sea shore at the southeast entrance to Halifax Harbor, northward to the Renfrew gold district, a distance of about thirty-five miles. The direction of these nearly parallel anticlinals is about east and west; but to the westward they bend towards the south, and to the eastward, in like manner, disappear beneath the sea, between Cape Canseau and Liscombe Harbor, with a strike, E. 30° S.

In addition to the great east and west folds, the gold series is affected by a second series of more gentle undulations, having a north and south direction, and producing transverse anticlinals, on the crowns of which the gold-bearing portions of the series are brought to the surface, while they are concealed not only in the great east and west synclinals, but also in the north and south synclinals where these traverse the east and west anticlinals. The total thickness of the series, as already stated, is estimated at about two miles, and the amount of erosion on the crowns of some of the anticlinals, according to Mr. Campbell, cannot be less than one and a half miles in vertical thickness, of which the upper half mile, consisting of clay slates, is generally sterile. Since, so far as yet observed, the gold is confined to the quartzite and the lowest portions of the overlying clay slate, it would follow that wide areas of the latter, holding the upper portions of it, will be destitute of gold, or yield it only along a narrow belt where the lower and auriferous portions of the slate may be brought to the surface along the line of an anticlinal, as is observed, according to Mr. C., at the Ovens gold field. When, on the contrary, erosion has exposed a wide zone of the underlying quartzite on the crest of an anticlinal, the breadth of the area in which gold may be sought for is much increased.

Mr. Campbell has called special attention to what he has called the grain or reed-like