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Introduction.

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This age has been appropriately termed "The Iron Age". While iron is without doubt the most useful mineral in the field of science and invention, there are many other minerals which are also very important. Nickel will probably become almost equal to iron in the scope of its usefulness in the arts. Other minerals, that were once thought useless, are proving themselves valuable, some almost invaluable. The mineral Cobalt is a good example. It was first thought worthless but later its oxide was discovered to have the power of coloring glass. It now forms the basis of all blue color in the manufacture of glass and porcelain. Minerals perhaps more than anything else build up the greatest Nations. Great Britain, Germany, the United States, probably owe their greatness in a large measure to their splendid deposits of economic minerals. The increasing demands being made upon their mineral resources must bring about a decline in their output, must inevitably exhaust mines that for richness and magnitude have been unprecedented in the history of the world.

The country of the future is the country with mineral deposits, dormant and unexplored, yet rich and great as the mightiest gone before. Such a country we believe our own Canada to be.

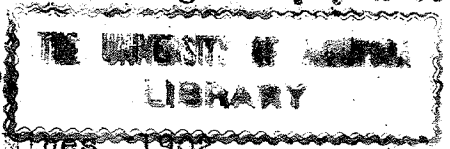
Canada, so long looked upon as a great frozen waste, barren alike in agriculture and mineral resources, is to-day rapidly taking a place in the very front rank of agriculture Countries; and she is also surpassing the world with the richness of her mineral deposits. In speaking of the Granby Copper mines at Phoenix B. C.,

1. Mr. John Stanton, who has been designated "Father of the Copper Industry", said:- "The Granby ore body is the largest sulphide deposit I have ever examined and my experience has extended to every variety of Copper ore. It is analogous to the famous Rio Tinto of Spain. It is larger than the famous Tennessee deposit. Hitherto sulphide ore bodies from 40 to 80 feet wide have been considered large but this one at Phoenix eclipses anything I have ever seen. The millions of tons of ore in sight and the vast stopes proved a veritable revelation to me".

Although the United States is one of the two great Copper countries of the world, yet she eagerly buys Copper pyrites from the Capleton mines in Quebec; admitting it better than her own for the manufacture of Sulphuric Acid.

2. Mr. H. E. Parrish, C. E. and M. E. of the Geological Survey of Pennsylvania, in speaking of the coal deposits of Vancouver and Queen Charlotte Islands said: "With the knowledge I have of the coal regions of Pennsylvania, acquired there as a mining engineer and on the geological staff of that state, it must gratify you to

1. Review of Mining in B. C. Bulletin No. 19
2. Article on coal in Report of Section of Mines, 1902.



know that, in my judgment, you have the best coal field I have seen. Until I visited it I had no conception such a valuable field existed on the Pacific Coast. You possess a number of beds of superior quality and unusual thickness".

1. Canada's nickel deposits at Sudbury are now well known. She and New Caledonia are the two great nickel producing countries of the world and Canada's production now exceeds that of the French colony. Nickel has become a very important metal since it was discovered that a mixture of 30 per cent nickel in steel doubles its strength. It is now perhaps second to iron.

The recent discoveries of Cobalt- nickel- arsenic- silver mines near Lake Temiskaming are unique on this continent and place Canada on a par with the famous Joachimsthal region of Saxony.

2. Dr. P. L. Heroult, technical director of the French Electro Metallurgical society, says, "In ten years Canada will have an iron industry larger than any other in the world". He has installed a plant at the "Soo" to experiment in smelting iron ores. This system is a success in La Praz, France, in Syracuse, N. Y., and other places and there is no reason why it should not be a success in Canada. If so Canada's immense iron deposits and her mighty water powers will enable her to produce iron cheaper than any other country in the world.

- In gold mining Canada's lode mines would seem to take a very low place when compared with such famous mines as The Homestake of South Dakota, the Boulder, Perserverance, Golden Horse-shoe and others of West Australia; The Champion Reefe and Mysore of India; the large Transvaal mines etc. These mines owe their fame to the great amount produced rather than to the high grade of their ores. The Australian mines go down to great depths the shaft cutting one saddle reef below the other to a depth of 2,000 feet or more. In Nova Scotia
3. mining has always been confined to one saddle reef. This was largely due to the extensive nature of the leads in Nova Scotia and to lack of knowledge as to the nature of the deposits. Now, however, deeper mines are being sunk and it is at least possible that Nova Scotian mines may rival the world's great producers.

In placer mines those of the Klondike are said to be the richest ever discovered. Over \$100,000,000 worth of gold has already been produced. Colonel Conzad still claims his mine at Conrad to be the richest in the world.

1. Report of Bureau of Mines Ontario 1905.
2. Article Winnipeg Free Press.
3. Gold measures and Deep Mining in Nova Scotia by E. R. Fairbault.

In silver Canada's mines bid fair to place her in the front rank, the wonderful richness of the Cobalt district bidding fair to parallel the famous Silver Islet of Lake Superior where \$3,500,000 worth of silver was taken from an island too small to support adequate surface workings for the mine.

1. The Canadian production of platinum is not large, about 650 ozs. per year from Sudbury, 30 ozs. from Similkameen district of British Columbia, and a small amount recovered from the placers of the Yukon. Yet she has the chief, if not the only, supply in North America. There is a probability that the amount from British Columbia will increase, as a number of the sluice and hydraulic mines have been making no attempt to save it.

Diamonds have not yet been definitely located in Canada but they are found in the glacial drift of Wisconsin, Michigan, Indiana and Ohio and these undoubtedly had their source in Canada.

2. Canada's peat bogs are immense in extent and when fully explored it is believed will equal those of Russia whose mighty steppes are known to possess 67,000 sq. miles of peat.

In short our youthful country is already assuming giant proportions in many industries such as agriculture, lumbering, etc. promises to parallel these proportions in the equally important industries of mining and manufacturing.

The mineral regions of Canada may be arranged in four divisions viz:-

- (1) The Eastern division, comprising the St. Lawrence valley in Quebec, South-eastern Quebec and the Maritime Provinces.
- (2) The Laurentian area with its flanking deposits of Devonian Silurian etc. in Western Ontario, Huronian in Algoma, Animikee, etc. in Thunder Bay.
- (3) The great prairie tract.
- (4) The Western Division or Rocky Mountain plateau.

The mineral resources of each Division will be describes in the following pages.

The chief minerals of this region ^{Division. I} are gold, coal, iron, copper etc. of Nova Scotia, the gold, copper, and asbestos of Quebec, the Gypsum, etc. of New Brunswick.

The gold measures of Nova Scotia exist in rocks of lower Cambrian series. They are of sedimentary origin and are divided into two layers, a lower layer of quartzite, and an upper layer of slates. The quartzite contains the gold. This region has been subjected to some enormous force which has squeezed the strata into ridges running parallel with the coast, and reduced its former

1. Bureau of Mines, Ontario 1905.
2. Bulletin on Peat by R. Chalmers L. L. D.

width about one-half Glacial action wore off the tops of the anti anticlines and thus exposed the lower quartzite or gold bearing strata, in places. The pay streaks all exist near the apex of the anticlines, and here the mines are situated. The district occupies about 5000 sq. miles along the eastern side of Nova Scotia and contains about 30 mines. The ores are all free milling

1. The amount of gold mixed in Nova Scotia has been rather declining during recent years. But this, it is claimed, is on account of the small leads and chimneys being exhausted to a depth considered profitable for mining on a small scale, thus putting out of business the small miner and tributer. Henceforth, if the work is to be profitably carried on, the mines must be sunk to a greater depth, and this necessitates the investment of greater capital. The government of Nova Scotia passed an act in 1903 to assist in sinking mines to a depth of 2000 feet, and, as a result, at least two mines have been sunk to a depth of over 1,000 feet, and gold in presumably paying quantities found in each.
2. The ore of Nova Scotia is, however, of a low grade, and it is a difficult matter to make gold mining pay. The only salvation of the industry seems to be in the harnessing of the splendid dormant water powers so freely distributed over the provinces. This has been, in the case of the Dolliver Mountain Mine, with a substantial saving in cost.

Gold was probably discovered by the early French settlers in Nova Scotia. According to tradition it was first found in the county of Lunenburg. The first discovery of which we have positive information was by Daniel Dinock and David Whitford in 1861. The earliest discovery was followed by so many others that it was at first believed that the whole of the province was auriferous. Gradually, however, it became evident that the workable deposits of free gold were confined to the metamorphic rocks of the Atlantic coast.

3. Rocks that are supposed to be of the same age as the gold measures of Nova Scotia exist in New Brunswick. They extend from the western boundary of the province to Bathurst on the Bay of Chaleurs. These are mainly slates and quartzites with their metamorphic equivalents. They are mostly non-fossiliferous, and so doubts exist as to their geological age, which is also true of the gold measures of Nova Scotia. Numerous stories of gold finds have come from this region in New Brunswick and some parties even went so far as to erect a small stamp mill but as yet no gold has been found in paying quantities.

In Quebec rocks analogous to the gold measures of Nova Scotia are found south-east of the St. Lawrence valley. The rocks of the St. Lawrence valley, the so called Sillery formation, are now also

1. E. R. Fairbank-en-Geld Department of Mines Nova Scotia 1904.
2. Report of Department of Mines N. S. 1904.
3. Mineral Resources of New Brunswick by L. W. Bailey, Ph. D.

supposed to be the metamorphic equivalent of the lower Cambrian rocks found in the so-called "Eastern Townships."

1) The existence of gold in Quebec was noticed in 1835 in the valley of the Chaudiere. The discovery was accidental. Following this Charles D. Lery, secured the exclusive right to mine for gold in Beauce County. He began washing in company with James Douglas and established the presence of gold in notable quantities even finding some large nuggets in 1846.

Work was carried on, in a desultory and unsystematic way, for about 20 years. Legal difficulties also interrupted the progress of mining. In 1867 Mr. Lockwood got control of a considerable tract of land and began developments in a systematic way. He is now considered the chief developer of the region. At first gold was sought only in the river beds and flats. Mr. Lockwood showed that, to prosecute the work with success, excavations should go down to the old river channels buried deeply beneath the present level. Shafts were sunk from 30 to 160 feet in depth to the auriferous gravel, which was a layer of 5 or 6 feet upon the bed rock. The cracks in the rock also contained gold, necessitating the working of several feet of rock.

At the junction of the duLoup and Chaudiere rivers extensive surface alluvial deposits exist. Mining by the hydraulic process was tried, a flume 20 miles long being built, which gave a head of 150 feet of water. Still the method was not a success and was soon abandoned.

It has been pretty well established that the source of the alluvial gold is local, being derived from quartz veins traversing the Cambrian slates of the region. These are found to be gold bearing nearly everywhere. Pieces of gold are often found sticking to the quartz. The alluvions near the quartz are very rich, the gold is coarse showing that its source is not far off. Working of the quartz has been little attempted however.

The Beauce region occupies 1500 sq. miles in the valleys of the Chaudiere and duLoup. The richest region is along the Gilbert river, and here nuggets have been found weighing 50 ozs. or more.

Some gold is got from the Pyrite mines near Capleton.

COAL

(2) In Nova Scotia there are several extensive areas of bituminous coal which have been mined for many years. New Brunswick has a smaller area. The rocks are the carboniferous, which occupy a large triangular portion of central and eastern New Brunswick, and the North Eastern part of Nova Scotia, including a considerable portion of Cape Breton.