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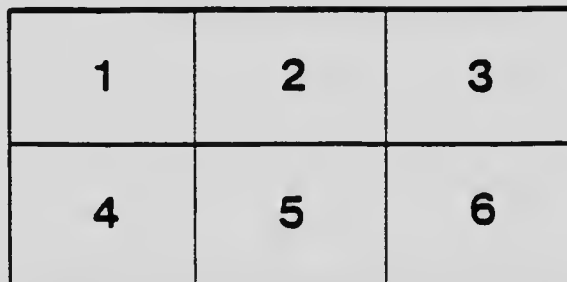
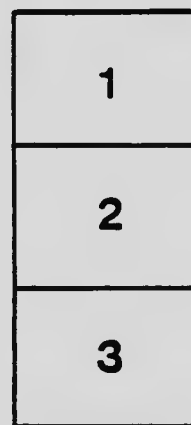
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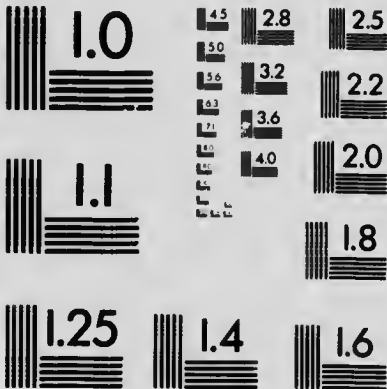
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THE MINERAL RESOURCES OF NEWFOUNDLAND.



— BY —

JAMES P. HOWLEY, F.G.S.

MARCH 5th, 1909.

Robinson & Company, Ld. print.



ERRATA:

- Page 3, line 13, from top, add the word "interest" after without.
" 3, " 4, " bottom, read "vigorously" for vigorously.
" 9, " 3, " top, read "The" for the.
" 6, " 3, " bottom, read "works" for work.
" 7, " 10, " top, insert after found: "not only."
" 7, " 12, " bottom, omit the word "ore."
" 10, " 12, " top, read "magnetite" for magnetic.
" 11, " 8, " top, read "ores" for ones.
" 13, " 15, " bottom read "25,020,000 tons" for 25,020,00 tons

Palaeozoic times, such as the Laurentian, Huronian, or Pre-Cambrian, Cambrian, Silurian, Devonian and Carboniferous. It is consequently one of the oldest countries in the world.

It has throughout the fire, so to speak, and large areas are found to be occupied by igneous, eruptive, and igneo aqueous materials, otherwise highly metamorphosed sediments, indicating prolonged volcanic action at different periods of its structural history.

Still later, during the Post-Pliocene glacial epoch, an immense ice-mantle seems to have enveloped the whole surface of the country, and when, under more congenial conditions of temperature, this ice cap began to give way, its onward movement, descending from the higher elevations towards the sea on every side, acted like a cyclopean ploughshare. It tore up, pushed, or carried along everything that came in its way, scattering broadcast over the



THE Mineral Resources of Newfoundland.

BY JAMES P. HOWLEY, F.G.S.

NEWFOUNDLAND is a country that has undergone many vicissitudes during the earlier geological epochs. Its rock structure consists chiefly of the most ancient series comprised within Archaean, Eozoic, and Palaeozoic times, such as the Laurentian, Huronian, or Pre-Cambrian, Cambrian, Silurian, Devonian and Carboniferous. It is consequently one of the oldest countries in the world.

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The Mineral Resources of Newfoundland.—3

mean order should occur. Such has been abundantly proven to be the case; although as yet mining may be almost looked upon as still in the infant stage. What was once considered as indicative of its utter barrenness, turns out, in the light of modern scientific research, in reality, to place Newfoundland in the category of one of Nature's treasure houses.

Almost every known metallic substance has been found in the country, and as it becomes still further explored, there is a strong presumption that the few remaining minerals, not hitherto met with, will be added to the list.

The following brief particulars of our mining industry to date may not be without.

COPPER.

Copper mining ranks first in point of time, as it did until recently in importance. It may be said, however, to have commenced as recently as 1864, when the Union Mine at Tilt Cove was opened. Previous to that date, some desultory mining did take place it is true, but I can find recorded, during the ten years preceding that time an output of some 628 tons only.

The Tilt Cove Mine, in Notre Dame Bay has been a constant producer since its inception to the present date. It was followed in 1875 by the opening of the Bett's Head Mine, and in 1878 by that of Little Bay. Several others of less importance, all situated in the same great bay, became small producers at later periods. Other sections of the country have more recently attracted attention owing to their promising copper deposits. The Western Copper Company's Mine at York Harbor, Bay of Islands, though not as yet vigorously worked, seems destined to become a large producer in the near future. Within the past year, a new copper mine has been opened by some English capitalists, at a place called Goose Cove, in Hare Bay, near the

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northern extremity of the island, and up to the end of 1908, some 700 tons of ore were raised. It is expected by the spring to have at least 1200 tons ready for shipment.

Altogether the statistics of our copper mining up to date, give a total output of 1,319,594 tons of ore, 78,015 tons regulus, and 5,418 tons of ingot copper, shipped from all the mines. The percentages of metallic copper contained in these ores have varied considerably, running from 3 or 4 up to 30 per cent. I cannot obtain an average, but taking it at about 10 per cent., the total yield of metallic copper should be in the vicinity of 140,366 tons.

Numerous indications of copper occur all around the coast and on some of the outlying islands, some of which may yet develop into paying properties. Very rich ores of copper glance, tetrahedrite, and erubescite are found in the Huronian series, on the southern parts of the island. One of these, in the immediate vicinity of St. John's City, is just now attracting attention, and a local company is being formed to exploit it. The ore is a very beautiful erubescite, running 58 per cent. in copper. Native copper occurs both in Conception and Placentia Bays in small quantity, and at one place in the latter bay, seems to offer a fair prospect for a paying proposition. It occurs on an island called Oderin, which is made up chiefly of greenstone and amygdaloidal trap, much of which is impregnated with finely disseminated scales or particles of copper. Some portions of the rock are quite rich in the metal, and at one point, where a break occurs, many lumps of mass copper were found amongst the debris that had tumbled down from the cliffs.

Until quite recently, it was believed that copper deposits, or for that matter, all mineral deposits, were confined to the immediate seaboard, but recently, discoveries have been made by The Newfoundland Development Company (Harnsworth) of lead and zinc, on one side of Red Indian Lake, and copper on the other, showing how fallacious this idea was. Red Indian Lake is in the very

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heart of the interior, and as the country becomes more and more opened up, no doubt other valuable finds will be recorded. No prospecting, worthy of the name, has yet taken place beyond a few miles from the coast.

IRON ORES.

In a report prepared for the information of the Imperial Government in 1895, on the occurrence of iron ores in Newfoundland, it was shown that deposits of this mineral of almost every known variety were found here. These include magnetite, hematite, limonite, specular and jaspery iron ores, clay iron stone, bog iron, ochreous ores, etc. So far none of these have been exploited to any extent, with the exception of the remarkable deposit of hematite on Bell Island, in Conception Bay. Perhaps nowhere in the world is there to be found a deposit paralleling this one. It is altogether of such an unique character, in its extent, and the interesting geological conditions under which it occurs, that a brief description of its principal features may prove of interest.

Great Bell Island is one of a group of three islands situated in Conception Bay, near its south side. It is the largest and lies furthest out from shore; is about six miles long by about two miles wide, having a surface area of twelve square miles. It forms, with the other two islands, the remnant of what was once a great trough of Cambrian rocks, which occupied the entire area of the bay. The former existence of this trough is plainly indicated by the presence of narrow fringes of its basic members, stretching along the shores of the bay on either side. On the south side, a fringe of about one mile wide extends along shore some ten miles, facing the bay and dipping towards the water, while on the north side, on the outer headlands, isolated patches of similar rocks are met with, dipping in the opposite direction, also towards the water. The islands above mentioned form the highest portion of this former trough now visible, but the centre of the trough must still

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lay out beneath the water, some three or four miles north from the great Bell Island. Numerous typical fossils of the upper Cambrian series are found on this island, the strata which lie pretty flat, have a general inclination towards the north at an angle of 8° or 9°.

It may be readily inferred that the greater portion of this trough has been denuded, chiefly by ice action, the debris being carried out to sea. Ample evidence of this fact is everywhere apparent, by the presence of perched boulders, the rounded and grooved contour of the surface, which is polished and striated in many places, even the ore beds themselves having been subjected to this denuding agency.

Interstratified with the shales and sandstones, composing the structure of the island, there are altogether twelve bands of ore, ranging in thickness from one to ten feet. The two largest bands near the top of the section, are situated on the northern slope of the island, and occupy the segment of an ellipse. So accessible are these beds, and so little capping of rock or debris covers their out crops, that almost every ton of ore they contain can be recovered. The Nova Scotia Steel and Coal Company were the first to operate a mine here. They commenced work in 1895, when they shipped their first cargo of ore. In 1899, they sold out the lower and larger bed to the Dominion Iron and Steel Company, since when the work of mining has been vigorously prosecuted by both companies. Up to the end of last year they had shipped between them 7,000,000 tons of ore, and have still in reserve, on the land area alone, about 25,000,000 tons. Most of the Dominion Company's ore goes to the gigantic smelting establishment of that company in Sydney, Cape Breton, while that of the Nova Scotia Company finds its way to various markets in both Europe and America. The pig iron and steel produced at the Sydney work, is finding favour in all directions. Last summer I saw car loads of steel rails from thence in transit to the upper provinces for the laying down of the new

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Grand Trunk Pacific Road, and more recently ship loads have been sent to India, for a similar purpose.

Both these companies are the holders of large submarine areas, covering the ore deposit under the bay. That of the N. S. Company comprising 33 square miles, and of the Dominion Company 5½ square miles. In view of the rapid diminution of the ore on the land area of the former company, they have, during the past two years, been driving out under the water, in order to reach their claim, which is situated three quarters of a mile from the shore, the latter company holding a claim for the first mile contiguous to the shore of the island. Two main parallel drifts, commencing on the land, and following the slope of the ore bands seaward, have now reached well within the company's boundary. In driving this slope the ore has been found to maintain its general character throughout, but to increase both in thickness and quality as the centre of the trough is approached.

I have taken some trouble to make an approximate estimate of the probable quantity of ore this entire trough may contain. By the aid of the dips and strikes of the strata it is possible to form a fair idea of the extent of the trough. Unless some unforeseen disturbances should occur cutting off the ore, or throwing it out altogether, and provided the ore bands maintain their thickness and regular stratified character throughout, a fairly reliable result can be arrived at. According to this mode of figuring then, I find the trough should contain the enormous amount of 3,635,543,360 tons. Of course this estimate takes into account all the ore bands now known to exist on the island.

I shall not hazard any opinion as to the amount that may be recoverable, that I should say will largely depend upon the conditions met with, the engineering skill to cope with any difficulties that may present themselves, and the adequacy of the machinery employed to keep the mine dry and fully ventilate it.

CHROMITE.

This is another mineral substance of which the country is known to possess several large deposits. They are chiefly situated at a distance from the seaboard, and as yet only one attempt to mine the ore has been made, near Port a Port Bay, on the West Coast. Between the years 1895 and 1899, some 6,000 tons of a high grade ore were raised and shipped to market. Since then the industry has not been prosecuted, but several new and extensive deposits have been discovered, inland from the same bay, and again on the head waters of the Bay D'Est and Gander Rivers. Analyses of some of these ores has proven them to contain a small percentage of platinum.

PYRITE.

The ordinary iron pyrites (Bisulphuret of iron) is a very abundant mineral, and occurs in association with all the copper ores around Notre Dame Bay. Pyrrhotite and Mispickel are also quite common ores, the former containing a small percentage of nickel, the latter some gold. Only the first mentioned has ever been mined to any extent, chiefly at a place called Pilley's Island in Notre Dame Bay. There were shipped from this mine, between the years 1883 and 1907, both inclusive, 518,280 tons, all of which went to the New York market for the production of Sulphuric Acid. The ore ranged high in sulphur, averaging about 53 per cent.

NICKEL.

Copper Nickel, Cloanthite, and Nickel pyrites were found in association with the Tilt Cove copper deposits, and at one time a small quantity was extracted and marketed. Some 320 tons were produced between 1869 and 1876. Small quantities of Cobalt accompanied this Nickel. Possibly, some of the Pyrrhotites may be found to contain paying quantities of Nickel, they are exceedingly like the Sudbury ores in appearance.

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ANTIMONY.

A most promising deposit of Stibnite occurs at a place called Morton's Harbor on New World Island in Notre Dame Bay. Some attempt to mine it took place at one time, several years since, when a few thousand tons were extracted. The ore was a high grade one, but I presume the low prices ruling for this material was the chief cause of the Company's ceasing to operate the mine. At all events, it has been lying undeveloped for several years past.

LEAD.

Ores of galena are of frequent occurrence on almost every side of the island, though but little attention has been paid to them of late. There was a time when some considerable activity in lead mining took place, especially at a place called LaManche in Placentia Bay. This mine up to 1893^{*} produced 18,762 tons. At two other places in this same bay, Lawn and Little Placentia, operations were carried on for a short time on similar deposits and considerable ore produced, but there are no returns available.

MANGANESE.

Extensive deposits of low grade manganese are found along the south side of Conception Bay, in conjunction with the limestone near the base of the Cambrian series. A few attempts have been made to test these deposits, but no regular mining has as yet been entered upon.^{*} Wad or bog manganese is found in many places, but no high-grade Pyrolusite has so far been discovered here.

Amongst other ordinary metallic substances known to occur in the island, I shall merely mention the following: Zinc, Cadmium, Bismuth, Tin, Rutile, Molybdenite, etc. With the exception of the two last named the rest are only found by assay tests of other substances, such as lead and zinc ores.

^{*} At the present time, June, 1909, a more effectual attempt at mining this ore is being made.

PRECIOUS METALS.

Gold is not mined at the present, per se, yet the country affords ample evidence of being auriferous. Nearly all our copper ores contain a small proportion of the metal, and free gold has been found on every side of the island, usually in quartz veins. Various attempts have been made to exploit these from time to time, but have not so far been attended with much success. During the years 1904-5-6 a mine was operated at a place called Mings, north of Cape St. John, which seemed to afford great promise for a while. The lode was a mixed one, composed of magnetic, pyrite, quartz and jaspery slate rock. The first trial assay of 23 tons of this ore yielded 10½ ounces of free gold in addition to which the slimes carried a value of \$55.00. A shaft was sunk upon this lode to a depth of something over 100 feet, and a drift run along its course another 100 feet. Assays were made of sample lots of the ore taken from various depths, as this work proceeded, which gave as a result an average value of \$12.44 per ton. Two gold bricks, one of 11 and the other of 37 ounces were produced, and the prospects began to look very favorable for a time, but from want of sufficient capital or other cause the mine has been closed down. Another attempt to mine gold bearing quartz in a talcose schist, was made at Sop Arm, in White Bay, during the year 1903, when about 150 ounces of gold were obtained. A few other instances of unsuccessful gold mining took place in different sections of the country, but all ended similarly. Nevertheless, I am inclined to believe, had some of these properties been carefully and economically handled, with up-to-date appliances for recovering all the values, they might have developed into paying propositions. Quartz veins are numerous all over the island, but no systematic prospecting for gold by persons well skilled in that particular business has ever taken place.

As already stated, nearly all our copper ores contain some gold. In the case of the ore from the Tilt Cove mine

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it is known to carry about 1.5 dwts. per ton. This is recovered during the process of treating the ore at the Cape Copper Co.'s works, Breton Ferry. No actual statistics of the amount or value can be obtained, but it is known to have reached in some years, from 3,000 to 5,000 ounces.

SILVER.

Silver occurs in combination with both copper and galena in many places. Some of the latter ones are highly argentiferous, and have been known to run as much as 400 ounces to the ton of metal. At Lawn, in Placentia Bay, in mining lead, a pocket or "vugh" was met, containing loose earthy chloride of silver, mixed with which was some native, and ruby silver (proustite). Some of the silver contained in the Tilt Cove copper ore was recovered along with the gold, but there are no statistics.

COAL DEPOSITS.

A great deal has been said and written about our coal deposits, but coming as it did chiefly from persons who knew nothing about the subject, was of course of an unreliable character. It may prove of interest to have a plain statement of the actual facts with regard to this subject from one who has had most to do with the exploration of these coal fields.

There are in Newfoundland three distinct carboniferous areas, one in the Codroy Valley, another in the country lying to the south of Bay St. George, and the third on the upper reaches of the Humber River, in the region extending between Grand and Sandy Lakes. The first named is of very limited extent, being a mere segment of a trough, cut off by a great fault. There are two little patches of about a mile each in longitudinal extent, but the greatest thickness of the true coal measures does not exceed 250 to 300 feet in all. Nevertheless, within these narrow limits there are six seams of coal, all standing in a vertical position. Four of the six are of small dimensions, but the remaining two are quite large. One at its outcrop showed 9½

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feet of good clean coal, while the other at one point was 23 feet wide, consisting of layers of coal, shale and clay, and containing 15 feet of fairly good coal. They did not, however, maintain this thickness throughout, but were found to vary considerably, the first had dwindled down to 5 feet, with only 3 feet of coal, while the larger seam, which was uncovered at five different places along its strike, gave an average thickness of $7\frac{1}{2}$ feet. The nine-foot seam was drifted upon for ninety feet, and about 100 tons taken out. Some of this coal was used by the Railway Company on their locomotives, with excellent results as a steam producer. It was found, however, in running the drift, that the seam soon became pinched up to about 3 feet, after which it widened out again to $6\frac{1}{2}$ feet, but at the end of the drift ran chiefly into shale.

The Bay St. George coal area is in the form of a narrow trough situated some eight miles inland from the south shore of the bay. It strikes generally about N. 80° E., S. 80° W., magnetic, being almost parallel with the coast line. The full extent of this trough is not yet known, but it has been traced for about five miles longitudinally. Three brooks, which have cut channels across it, afford the only available sections of the measures. On the most westerly of these, called Middle Barachois, a good section of about two miles in extent is exposed. When this was stripped with pick and shovel, twelve separate coal seams were revealed, on the north side of the trough, most of which were again uncovered on the opposite side also, dipping towards the former. The seams ranged in thickness from a few inches up to over five feet, and the coal in several was of first class quality. On Robinson's River, two miles further east, and on a tributary of the latter, two and a half miles still further east, small exposures of the coal measures are again met with. The Robinson's River section contained three seams, one of which gave a thickness of 4 feet 2 inches of good solid coal, and on the Northern Feeder, four seams were uncovered. Only one of these latter was of any importance. Although but 1

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foot 6 inches in thickness this coal was of an exceptionally superior quality, being clean, bright and semi-anthracitic in character. It was found to be low in sulphur, burnt with a bright clear flame, in an open grate, and left but a small percentage of ash.

The coal seems so far known to occur in this trough, over one foot in thickness, are as follows :

| Ft. Ins. | | |
|-------------|-----|--|
| Murray Seam | 5 4 | } All on the Middle Barachois River |
| Rocky " | 1 5 | |
| Clay " | 1 8 | |
| Slaty " | 1 4 | |
| 18 inch " | 1 6 | |
| Jukes " | 4 6 | |
| Cleary " | 2 2 | |
| Howley " | 4 2 | |
| Shears " | 1 2 | .. On Northern Feeder. |

The aggregate thickness of all these seams in this trough is 27 feet, which, should they maintain this average throughout, give as a result, for every mile of superficial area they may be found to underlay, 25,920,00 tons of coal.

In the Humber Valley the Carboniferous series spreads over fully five hundred square miles of country, but by far the greater portion of this is occupied by the lower and unproductive members of the series. Here again, the true coal measures are confined to a long, narrow trough, which extends along the south side of Grand Lake some four or five miles, and thence strikes North-Easterly into the flat country, lying between Grand and Sandy Lakes. This trough has now been traced over eleven miles on its strike, and in all probability it terminates in Sandy Lake, some six or seven miles further on.

The country hereabout is very difficult to explore, owing to the immense accumulation of superficial debris, in the shape of sand, gravel and boulders, spread out over

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the surface, in all directions, effectually concealing the structure beneath. Of late years, the Calyx boring drill has been brought into requisition, to test this coal field, and we are gradually acquiring a better knowledge of its extent and possibilities.

What has been ascertained up to the present time is as follows. One small section was uncovered on Aldery Brook, south side of Grand Lake, two miles from its head. Here the trough is very narrow, and lies close up against the Laurentian Hill range. It does not exceed altogether, a quarter of a mile in width, yet it contains thirty outcrops of coal, all crowded together, in a nearly vertical position. Owing to the doubling up of the strata these outcrops, in reality, only represent fifteen distinct seams. They vary from a few inches up to six-and-a-half feet in thickness. The largest seam was drifted upon for 150 feet, and a good deal of coal of excellent quality taken out. Several of the other seams also were partly opened up, and some good coal extracted from them.

Six seams in this section exhibited at their outcrop the following dimensions:

| | feet. | inches. |
|--------------------|-------|---------|
| One seam | 2 | 0 |
| “ | 1 | 6 |
| “ | 1 | 8 |
| “ | 6 | 6 |
| “ | 3 | 0 |
| “ | 2 | 6 |

One-and-a-half miles further east on Coal Brook, eighteen outcrops were observed, representing nine separate seams. Here the trough begins to widen out somewhat and the angle of inclination of the bedding assumes a dip of 50° or less. Six of the above seams were of the following dimensions:

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| | feet. | inches. |
|----------------|-------|---------|
| One seam | 4 | 4 |
| " | 3 | 5* |
| " | 4 | 0 |
| " | 1 | 6 |
| " | 2 | 4 |
| " | 1 | 0 |

On Kelvin Brook, two-and-a-half miles still further east along the strike, a small section only, on the south side of the trough, exhibited six seams, three of which showed:

| | feet. | inches. |
|----------------|-------|---------|
| One seam | 3 | 8 |
| " | 2 | 6 |
| " | 6 | 2 |

Three and three quarter miles eastward, where the railway crosses the trough, near Goose Brook, three seams were discovered by sinking pits through the gravel and sand. These were all on the south side of the trough, dipping nearly north, at a much lower angle, indicating a considerable widening out of the measures. Owing to the utter impossibility of accomplishing any further effective work here with pick and shovel, recourse was next had to the Loring rod. During the past few years ten holes were put down at short intervals apart, which resulted in finding several new seams. Seventeen seams were bored through during the past two years, which, with the three previously mentioned, make twenty altogether so far discovered in this Goose Brook section. As in the other cases, they vary considerably, running from a few inches up to something over three feet. Nine of them ranged from one foot upwards, thus:

*The Reid N.F. R.R. Company mined this seam for a while and extracted therefrom about 7,000 tons, all used on locomotives.

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| | feet. | inches. |
|----------------|-------|---------|
| One seam | 2 | 6 |
| “ | 3 | 4* |
| “ | 1 | 6 |
| “ | 3 | 0 |
| “ | 2 | 6 |
| “ | 1 | 0 |
| “ | 2 | 4 |
| “ | 1 | 0 |
| “ | 1 | 6 |

Much still remains to be accomplished before the full extent and importance of this promising coal field is thoroughly worked out. But enough is known to warrant the assumption that here we have a possible asset of great future value to this country. I would not at present attempt even an approximate estimate of the amount of available coal within this area, but have no hesitation in pronouncing the opinion that it must mount into many millions of tons.

I append a few assays of these coals made several years ago which will give some idea of their composition:

FROM BAY ST. GEORGE.

| | Clary Seam. | Jukes Seam. | Howley Seam | Shears Seam |
|------------------|-------------|-------------|-------------|-----------------|
| Moisture | 3.548 | 3.039 | 2.784 | 4.00 |
| Volatile matter. | 30.807 | 30.314 | 29.784 | 33.12 |
| Fixed carbon... | 55.229 | 60.142 | 54.468 | not given |
| Sulphur | 3.046 | 1.963 | 3.047 | 0.44 |
| Ash | 6.380 | 4.515 | 10.430 | 3.10 |
| | 100.000 | 100.000 | 100.000 | Coke 61.371† |

*This seam was also mined to some extent by the Messrs. Reid and a few thousand tons taken out.

†The evaporative power of this coal expressed in pounds of water evaporated by one lb. of coal at 212 F. was 12.371, which considerably exceeds that of North Sydney, or the best Scotch, Welsh or English coals.

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FROM ALDERY BROOK, GRAND LAKE.

| | No. 2. | No. 4. | No. 7. | No. 9. | No. 13. | No. 16. | No. 17. | No. 20. |
|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Moisture..... | 10.22 | 5.50 | 10.77 | 13.71 | 15.78 | 5.32 | 4.32 | 7.41 |
| Volatile Matter..... | 24.30 | 31.14 | 10.55 | 20.84 | 30.40 | 33.02 | 10.84 | 30.75 |
| Fixed Carbon..... | 48.50 | 57.80 | 33.89 | 51.00 | 48.20 | 53.28 | 72.06 | 52.40 |
| Ash..... | 15.72 | 4.08 | 37.87 | 7.50 | 8.68 | 1.40 | 5.53 | 7.71 |
| Sulphur..... | 1.16 | .82 | .03 | .84 | .55 | .70 | .85 | .66 |
| | 100.000 | 100.000 | 100.000 | 100.000 | 100.000 | 100.000 | 100.000 | 100.000 |
| Coke in closed vessel | 65.39 | 62.76 | 72.68 | 50.50 | 33.62 | 60.50 | 78.84 | 61.86 |

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Specimens from the principal seams on Coal and Kelvin Brooks gave the following results:

| | FROM COAL BROOK. | | FROM KELVIN BROOK |
|-----------------------|------------------|---------|-------------------|
| | No. 3. | No. 4. | No. 1. |
| Moisture | 9.93 | 5.02 | 8.44 |
| Volatile Matter | 24.01 | 31.25 | 28.54 |
| Fixed Carbon.. | 49.15 | 54.03 | 50.07 |
| Ash | 16.14 | 8.66 | 11.53 |
| Sulphur | .77 | 1.04 | 1.42 |
| | 100.000 | 100.000 | 100.000 |
| Coke in closed vessel | 66.06 | 63.73 | 63.92 |

I shall merely mention the occurrence of other non-metallic substances of value, few of which have received any attention up to the present time, while others have been exploited in a small way only. These comprise Asbestos, Baryte, Feldspar, Garnet, Graphite, Grind stones, Gypsum, Hone stones, Infusorial earths, Kaolin Lithographic stone, Mica, Petroleum, Salt, Slate, Talc, Steatite, &c.

In 1902-3-4, there were shipped some 6,615 tons of Barytes, and in 1904-5, 6,000 tons Talc. In 1904 the Parson's Pond Oil Fields produced 700 brls. Petroleum, but a much larger quantity has been pumped from the wells since then, of which there is no record. Last year several hundred barrels were utilized at the Gas Works in St. John's to enrich the gas production of the coal used, with, I understand, most favorable results.

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The Slate of this country is of superior quality, and has been pronounced fully equal to that of Carnarvonshire, Wales, by those competent to judge. It fetches in the English markets the highest price of any imported slate. It is an abundant material, and is found in large deposits on both the eastern and western sides of the island. Quite a lot of excellent slate has been produced from the quarries in Trinity Bay during a number of years past. Recently a new quarry has been opened on the Humber Arm, Bay of Islands, and the slate therefrom is, if anything, superior to that of Trinity Bay. So far no attempt has been made to utilize this material otherwise than for roofing purposes, but there is no doubt it is equally suitable for any other purpose to which slate is applied. Between the years 1865 and the present date, 153,702 squares of roofing slate have been manufactured at these quarries, a small percentage only being used locally, the remainder all going to the English markets where it found ready sale. Most of this slate is of a dark purple colour, but some of it is reddish, and also some of an unfading pea-green colour. It is said to be the best slate in America.

An infinite variety of building and ornamental stone is found here, such as granites, porphyries, sandstones, free stones, limestones, marbles of many shades of colour, including pure white statuary, serpentines, soapstone, &c.

Pipe clays, brick clays, fire clays, terra cotta clays, china clays, red and yellow ochres, and a variety of other substances likely some day to become of economic importance, go to make up the sum total of the known mineral resources of this, England's oldest colonial possession.

ST. JOHN'S, N.F. March 1st, 1909.

