

as to favour the probability that the precious metal exists ; but this is still to be proved."

The serpentine, with its chloritic slates and diorites, is closely akin to the great metalliferous zone of the Province of Quebec and the New England States, and very similar in its general characteristics to the copper-bearing rocks of Lake Superior. This series of beds is the one whereby Mr. Murray sets the greatest store. In his report for 1876, he says:—"The more valuable ores hitherto discovered upon this island, notably those of copper, nickel and chromic iron, have usually been found to be closely associated with serpentinous rocks ; and the presence of such rocks has frequently instigated close inspection of the ground, resulting in the discovery of satisfactory metallic indications." It would seem from this to be an important question to investigate, how large an area is occupied by such rocks? A careful answer to this question has been prepared by Mr. James P. Howley, who has explored much of the country as Mr. Murray's assistant. He estimates

The Areas of the Serpentine Series in Newfoundland :

Between Hare and Pistolet Bays.....	at	230 square miles.
South of Hare Bay.....	at	175 " "
North from Bonne Bay.....	at	350 " "
South " ".....	at	150 " "
South from Bay of Islands.....	at	182 " "
Surrounding Notre Dame Bay.....	at	1400 " "
Gander Lake and River Country.....	at	2310 " "
Bay d'Est River.....	at	300 " "

Of this large area only the portion surrounding Notre Dame Bay has been licensed and prospected. The lack of roads prevents explorers entering the Gander Lake and River Country ; and the uncertainty as to the extent of French rights upon the western coast closes it to all mining enterprise for the present.

The chief mines at present worked are known respectively as Bett's Cove and Tilt Cove (Union Mine), and are only twelve miles apart upon the western shore of Notre Dame Bay. Of this region Mr. Murray says in his report for 1875:—"I feel called upon to state that the experience of the late investigation convinces me more than ever that many of the northern parts of this island, and the great bay of Notre Dame in particular, are destined to develop into great mining centres, should capital and skilled labour be brought to bear in that direction. The frequent repetition of the mineral-bearing strata associated with serpentine, chloritic slates and diorites, maintaining a nearly uniform character throughout their distribution, and invariably exhibiting metalliferous indications, all seem to warrant the expression of such an opinion, although at the same time it must not be taken for granted that every individual spot where indications of this nature present themselves should necessarily prove of equal productiveness." "The ores of copper, usually sulphurets, are found disseminated or in layers with iron pyrites in the chlorite slates and dioritic beds ; but the more solid and valuable ores are concentrated in the folds and dislocations (particularly in the magnesian portions), by which the formation has been affected. The ores are also of frequent occurrence in white quartz veins near the same horizon." "In addition to the ores of copper, ores of nickel, magnetic, chromic and specular iron, lead and sulphur ores in abundance occur, and traces of the precious metals have occasionally been found by analysis, always near the same horizon. The usual form of the nickel ores is that of arsenical or copper nickel, but it also occurs as millerite or nickel pyrites, and as cloanthite or an allied species, which is of a steel grey or pale ruby-red colour. These nickeliferous ores have hitherto only been discovered in workable quantities at Tilt Cove ; but small specimens have been seen at several other places, and they have invariably been found by analysis to be present in the Serpentes." "At Tilt Cove a considerable amount of nickel ore has already been extracted from the mine and exported to Swansea, where a portion was found to yield about 24 per cent. of metal to the ton of ore, which, at the valuation of £6 sterling per unit, gave the handsome return of £141 sterling per ton. It has been found that the matrix of these nickel ores is usually calcareous, and that a mass of steatite or soap-stone is in close proximity." It was further observed that the ore-bearing rocks "became barren of ore, or at all events it was more widely disseminated, when they came in contact or nearly approached the granitoid intrusions, which latter appeared to be destitute of metalliferous material, except iron pyrites, which mostly occurs in intersecting quartz veins."

Copper was first found in 1857 at Tilt Cove by Mr. Smith McKay, who prospected the region upon Principal Dawson's advice. But the Union Mine was not opened until 1864. Although Bett's Cove Mine was opened some years later, its present output is about fourfold that of the Union Mine. During last year it shipped over 40,000 tons of ore to Swansea, and brought to bank 20,000 more. The facilities for extracting and shipping the ore at these mines cannot be surpassed. The ore is reached by galleries driven above water-level into hills rising directly from the coast. Large furnaces are being built at Bett's Cove to smelt the low grade ores that are not worth shipment to Swansea. The coal required will be brought out as ballast by the ships sent for ore. Over a thousand men are employed by this company during the present winter.

The *Engineering and Mining Journal* of 28th April last says of this mine:—"The deposit is a large one, and well situated for mining and shipping. The cars which bring the ore out of the mine can dump it on board the largest class of vessel without transshipment. Work is being pushed with considerable vigour, but without much technical skill. The consequence is that the workings are unsafe, several accidents having occurred involving a grievous loss of life ; and although large quantities of ore may be cheaply extracted at present, yet the future of the mine is being most seriously impaired."

From some of the returns of sales at Swansea during last July and August, I find that the Bett's Cove ore sold then averaged 10.475 per cent., and sold for about £6 3s od per ton, while Union Mine (Tilt Cove) ore averaged only 6.246 per cent., and sold for about £3½ per ton. As the freight to Swansea ranges from 16s to 20s per ton, and the facilities for mining and shipment are so great, the profits of these mines must be very handsome. Therefore it is

not surprising that almost the entire shores of Notre Dame Bay, and the enclosed islands, are now held under prospecting licenses.

The mining law greatly facilitates this, as under its provisions any person upon application to the Governor in Council, and on payment of £5 stg. for each area can obtain an exclusive right of searching for minerals for two years from date of license over any number of areas of three square miles each. And he is entitled to a grant of one square mile of each area licensed by him if applied for within the two years, upon payment of £10 stg. for each such mile. He then becomes entitled to "a grant in fee simple of the said lands, and all mines and minerals therein contained free from all forfeiture, but subject to all reservations for public purposes in any grant or lease contained." This grant, however, is "subject to the condition that should the mines not be actually worked within two years from the date of the grant, or if the grantee, lessee or assignee do not within five years from the aforesaid date *bona fide* pay out and expend the sum of \$10,000 in and about the working of such mines and minerals and a further sum of \$10,000 within six years from the expiration of said period of five years, or a *bona fide* expenditure in the aggregate of \$20,000 in and about such working within a period of eleven years from said date, then the said grant shall be forfeited, and the land so granted shall revert to the crown for the use of the colony." When any such grant is issued, the other two square miles of the original area shall be laid off in lots and sold to the highest bidder. There are no royalties upon minerals of any kind.

Many years ago Prof. Jukes reported his discovery in St. George's Bay of a seam of excellent cannel coal three feet thick, and apparently part of a large seam. This outcrop was examined by Mr. Murray and described by him in 1873 as 15 inches of coal and 27 inches of "coal in thin layers alternating with thin layers of argillaceous and carbonaceous shales." On Robinson's Brook, however, Mr. Murray found the outcrop of a seam, about four feet thick, of apparently homogeneous, very bituminous coal ; which burned with a clear flame like cannel coal, leaving a white ash. He considers that it may fairly be assumed that this seam is either the continuation of the upper bed on the Middle Barachois, which is distant nearly two miles, or else another very nearly on the same horizon. In his report for 1868 he says:—"To show the enormous importance of the existence of even one solitary seam of workable coal, I have made the following calculation of what might be expected within the area supposed to be underlaid by the one shown on my map. Taking the area of the plane of the seam at 38.4 square miles, and its thickness at three feet there would be 54,720,000 chaldrons of coal or 1,425,000 chaldrons per square mile." And he considered that a very considerable part of this *might* be found within workable depths. This is but one of the many seams that may yet be found in this area. This question of the productiveness of the Newfoundland coal measures will be of immense practical importance when the railway across the island is once fairly commenced ; for the western terminus of the route proposed lies on the coal measures of St. George's Bay.

The Carboniferous Formation contains other mineral treasures also. The lead ore of Port-au-Port Bay has been already noted. But its most striking feature is the enormous beds of gypsum ; which Mr. Murray declares to be "perhaps distributed more profusely and in greater volume in the Carboniferous country" around St. George's Bay "than in any part of the North American continent of the same extent."

As to salt, Mr. Murray says:—"From the frequent occurrence of lime springs throughout the Carboniferous regions, and especially near the gypseous division, there is every reason to believe that salt may be manufactured to a large extent, and become an article of commerce. Moreover, it seems by no means unreasonable to suppose, from various circumstances that have been observed, that the mineral may still exist in the solid form at some parts."

Of various other economic minerals, such as serpentines and marbles for ornamental purposes, sandstones and limestones for building, and whet-stones, grind-stones, &c., there seems to be no lack.

In the next article the mineral resources of our Maritime Provinces will be briefly discussed. And articles upon the other Provinces of our Dominion, proceeding from east to west, are expected to follow.

J. FRASER TORRANCE.

CANADIAN NATIONAL SOCIETY.

The closing months of the last year have been marked by the establishment of a Canadian National Society, whose chief object is the promotion of a Canadian national sentiment.

It is proposed to achieve this end by discountenancing Old World religious and sectional prejudices and local party bitterness, and by inviting the Canadian people to unite on the platform of "Country before Party and prejudice." It cannot be denied that a leaven of sectarian bitterness smoulders in the hearts of many who exchange the friendly nod. It is shamefully apparent that in the fight for party spoil national interests are immolated. The regrettable events of the last summer attest the one ; the harrowing diatribes of the party press the other. If the stranger journeying through our land accepted the diverse voices of the party press as an indication of our national character, his irresistible conclusion must be that we are either a nation of corruptionists, or liars. Party as exemplified in Canada is a national curse. It divides the representatives of the people into two great camps and camp followers, who contend in desperate struggle over the loaves and fishes extorted from the state for distribution among the "faithful."

The leaders may be able, and in some cases are honourable men ; but they are knee deep in the mire of partizanship from which, in their soul they must pray for an escape.

What principle divides the following Sir John Macdonald from that of the Honourable Alexander Mackenzie? In vain will the leaders attempt reply. Ambition, self-love and gain might be the not unfitting party watch-cry of either party.

The colony, dignified with the delusive designation of Dominion, is immersed in local broils, dishonouring to it abroad and ruinous to its real interests at home. What say the Canadian people to this carrion crowd who