

EDITORIAL

Capitalization of British Empire Steel Corporation Coal and Ore Reserves

A series of three well-informed articles on the financial condition of the nine companies which it is proposed to consolidate as British Empire Steel Corporation appears in the Toronto "Globe," and is concluded with the following discriminating comment, viz.:

"On the question of total assets Col. Morden insists that there has been a conservative valuation of the iron-ore and coal in the ground belonging to the various companies, the value of which is now placed at \$203,000,000 of the total assets valuation of \$407,000,000. The fact remains that the total assets of the leading companies of the nine in the merger are placed at slightly less than \$200,000,000 in their last annual reports. It is manifest that Col. Morden has adopted a different basis of valuation from that of the unit companies in preparing their annual reports. It is to be presumed that the coal and iron ore has hitherto been regarded as a nominal asset, which may explain the difference. This does not, however, relieve the new company from the necessity of most efficient management in seeing to it that the valuation put upon the coal and iron as in the ground is not above what is warranted in consideration of the coal and iron as a marketable commodity—in other words, the plan of organization to this extent capitalizes the future and contemplates many years of successful operation in bringing the raw materials to the Corporation's plants, and making them into millions of tons of marketable articles."

The capitalization of minerals in the ground is a difficult matter, and probably the safest method is to regard them as a nominal asset. This is particularly so where the mineral deposits are so largely submarine, as in the case of the coal and iron-ore areas of the constituent companies of the new Corporation. The greatest asset of the new Corporation will be its complete control of the points of access to the submarine mineral deposits, and the advantages that will accompany unified direction of the technical operations of winning the minerals. Another substantial asset is the land area of unworked coal.

With the exception of the winning of the three upper seams in the Sydney Field the land area is virgin coal. The seams crop concentrically each outside of the next superimposed seam, and thus, as the lower seams are reached, each one contains a larger superficial area of ungoten coal. These lower seams have hitherto been disregarded because of the better quality and great accessibility of the upper seams. Nevertheless, it may be stated that the ungoten land coal will provide the most dependable and lasting asset of the future. Comparative thinness of seams, less desirable quality, and, to an inexcusable extent, lack of accurate knowledge of the lower seams, are hindrances to profitable extraction that will gradually disappear under the compulsion of necessity, improved methods of extraction, and modes of preparation that have long since been matters of ordinary practice in other countries.

In connection with the submarine area, both coal and iron-ore, only a nominal value should be placed on the estimated content of mineral, because, while the supposition of their extension at least to the limits of profitable extraction is founded on excellent grounds, in the absence of actual knowledge there can be no absolute certainty such as is required in actuarial calculations.

There are also some fixed and unavoidable first charges on coal and iron-ore won from the most accessible and certain situations, which are emphasised in making future calculations on ungoten submarine areas, namely charges for depletion of areas, for redemption of capital, and for the provision of new openings to take the place of abandoned winnings. It will be an essential to the permanency and success of the new Corporation (which we desire again to emphasize, believing that exaggeration of emphasis on this point is impossible, is founded on the extraction of coal at a profit) that these charges shall be a primary addition to the other costs of coal production.

We note that the nominal capital of the new Corporation is fixed at \$500,000,000, and that while the appraised value of the aggregate assets of the constituent companies is placed at \$407,000,000, it is only proposed to issue securities of a par value of \$207,000,000, or approximately the sum of the assets of the combining companies as shown by their respective

balance-sheets. From this we deduce that it not the intention of the promoters of the new Corporation to issue share capital to the full extent of the appraised assets. In view of all the factors of uncertainty that surround the profitable winning of coal and iron-ore from submarine areas—some of them very remote from land—it is probable that the technical advisers of British Empire Steel Corporation will counsel the inclusion of the ungotten coal and iron-ore tonnages in the balance-sheet of the Corporation at purely nominal figures. It is also to be expected that the cost-sheets of the mining companies will be complete cost-sheets, showing the ultimate cost of coal over the whole expected life of the deposit under consideration, and not partial, and therefore inaccurate, cost-sheets such as have too often in the past led to erroneous conclusions and consequent financial embarrassment.

PIT TIMBER VERSUS PULP WOOD

At the recent meeting of the Mining Society of Nova Scotia, Mr. J. W. Revere, the veteran Purchasing Agent of the Dominion Coal Company, made the significant statement that the present growth of timber in Nova Scotia is not making up for the current consumption, and that in ten years' time the pit-prop timber of Eastern Canada will be exhausted.

Taken in conjunction with Mr. Frank J. D. Barnjum's exposé of the forest situation of Eastern Canada (see issue of January 30th, 1920) and the ravages of the spruce-bud worm, Mr. Revere's pronouncement, coming as it does from an expert of unique experience in the pit-timber trade of Nova Scotia, should alarm the coal operators of that province.

The competition of the pulp-wood industry is now being felt in Nova Scotia, and in Cape Breton Island itself the mills are paying twelve dollars a cord for pulp-wood.

We suggest that the acquisition of an adequate pit-timber reserve is fully worth the immediate consideration of the coal interests of Nova Scotia. The associated companies who will form the British Empire Steel Corporation own, it is true, some valuable lumber limits, but these are not particularly suited for growing pit-props. There are, however, areas in Cape Breton Island, which if properly forested and looked after, and reserved for the growing of pit props, could assure the coal mines of a fairly well-sustained supply for the future. The timber on these areas is well-suited for pulp-wood manufacture, but it should not be a hard matter to decide which is the more essential requirement, pulp-wood, or the provision of coal.

Mr. Jack Hammell is in Toronto. He is confident that a large amount of development work will be carried on at the Flin Flon property. The New Yorkers who have taken the option on the property are making good headway.

BRITISH EMPIRE STEEL GRANTED CHARTER IN NOVA SCOTIA.

British Empire Steel Corporation applied for a Dominion charter, but the way was made hard for it by the legislators at Ottawa, who criticised the proposals at long range and without understanding them. Nova Scotia, because of her vital interest in the main constituent companies of the consolidation, made the way of provincial incorporation easy, knowing from close acquaintance with the coal and steel industries, and through a thorough understanding of the problems that counsel consolidation, how desirable it was. Nova Scotia has tried independent operation of the coal fields, and has seen it fail.

A province which depends on coal royalties to the extent of between \$750,000 and \$1,000,000 annually, is not likely to gauge incorrectly the benefits which will follow the new capital investment, the larger markets, and the merged energies and purposes of its major industries, nor are the people of Nova Scotia to be accused of any lack of native shrewdness. The incorporation fees and corporate taxes of the new Corporation, added to those of the existing companies are not to be despised, but what chiefly disposes the Nova Scotians to favor the consolidation is the knowledge that it will effect economies in operation and in marketing, will increase the production of coal, steel and ships, and in many other ways will bring much grist to Nova Scotia's mill.

PERSONALS.

Mr. J. C. Murray is in Toronto.

Dr. W. L. Goodwin will preside at the Convention of Canadian Chemists in Toronto this week. The meetings will be held at the University of Toronto May 27 and 28.

Mr. David Rorison has resigned as Manager of the Inverness Colliery, Cape Breton, and has been appointed Manager of the Ridge Coal Co., near Minto, New Brunswick. He assumes his new duties at the beginning of June.

Mr. Balmer Neilly, secretary of the recently formed Ontario Mining Association is now located in the Trust and Guarantee building, 55 Bay St. Toronto.

Mr. Geo. R. Rogers, president of the Wasapika Consolidated Mines Ltd. is in Toronto this week, after being at the property for several weeks. He reports that the shaft has now reached a depth of 204 ft. where a station has been cut and a cross-cut run into the ore-body.

Mr. Jas. McEvoy expects to leave for the West this week. He will examine coal properties in the Edmonton district.

Mr. C. H. Hitchcock, of Sudbury, was in Toronto this week. He reports that diamond drill exploration is being carried on in several districts.

Mr. T. R. Jones, who lived for several years at Cobalt and managed the Buffalo mine is visiting Cobalt this week. Mr. Jones has taken an active part in developing properties in many districts in Northern Ontario.

Coast Erosion of the Coal Measures in the Sydney Coalfield, Cape Breton

By the Editor.

In a Bulletin on the coalfields of Eastern Canada, prepared by the writer for the Department of Mines, Ottawa in 1916, two photographs were re-produced showing the effect of the sea and the elements upon a sandstone spur that lies between the crops of the Hub and Harbor Seams, not far from the Harbor of Glace Bay. By the courtesy of Mr. B. A. L. Huntsman, of Sydney, an amateur photographer of much skill, the writer has been able to obtain a chronological series of later views of this spur that show the rapidity with which coast erosion proceeds on the exposed Coal Measures of the Sydney Field. The series is of sufficient interest to justify re-publication of the two original photographs with those that have been taken at later dates, the whole extending over a period of twenty years. For the original photograph of 1900, the writer is indebted to Mr. Stuart MacCawley of Glace Bay.

By the courtesy of Mr. C. M. Odell, the following view of the disintegrating and wasting Coal Measure sandstones and shales is reproduced from a photograph taken near Point Aconi in 1908 (on the North Sydney side of the coalfield) and originally published in a description of the operations of the Dominion Coal Company by the writer that appeared in serial form in the "Canadian Mining Journal" in 1908. In this view it will be seen that the overhanging marls have been undermined by wave action, much as a miner undermines the coal seams, and eventually the whole face of the cliff will slide into the sea.



The isolated sandstone spur, the completed work of erosion, shown in the following photograph, is to be seen near Indian Head, between New Waterford and Glace Bay.



Isolated Sandstone Spur at Indian Head, Sydney Coalfield, Cape Breton.

Another view of a sandstone spur is given, which is in the Waterford District of the Sydney Field. The spur is undergoing the same process of destruction that is illustrated by the Glace Bay series. This photograph was taken by Mr. Odell.

It is certain that a large portion of the undersea coal seams—probably nearly all the workable portion—is overlain by waters of the sea that have steadily encroached upon the land by the unceasing wave erosion along the shore line of Cape Breton. The ancient shore line can be detected by soundings at varying distances from the existing coast-line, and the intervening ocean floor has undoubtedly been gained from the land in modern geological time. The late Richard Brown, from observations extending over thirty years, estimated the wastage of the coast at about five inches a year, but the photographs will demonstrate, it is probably much more rapid in exposed spots. The shales and sandstones, because of their parallel bedding, and their seaward inclination, easily slide into the sea when loosened by the winter frosts. In the Spring, under the combined action of the thaw, the scour of the drift-ice and the frequent storms, the cliffs waste very rapidly.

The probability that the workable portion of the undersea coal seam is, in greater measure, overlain by an area of modern encroachment of the sea, has a favorable bearing on the extraction of the coal in undersea workings, inasmuch as the sea bottom will present a slight inclination seawards, free from pockets and fissures. The wave action prevents any heavy deposit of sand, and the ocean floor, for a long dis-

tance out is probably a rock bottom. There is also every likelihood that the earth movements which caused the four parallel folds of the Sydney Field, separating the main basins, were much prior in time to the modern sea encroachment, and that no disturbances of the measures in the areas intervening between the folds has occurred in modern geological time.

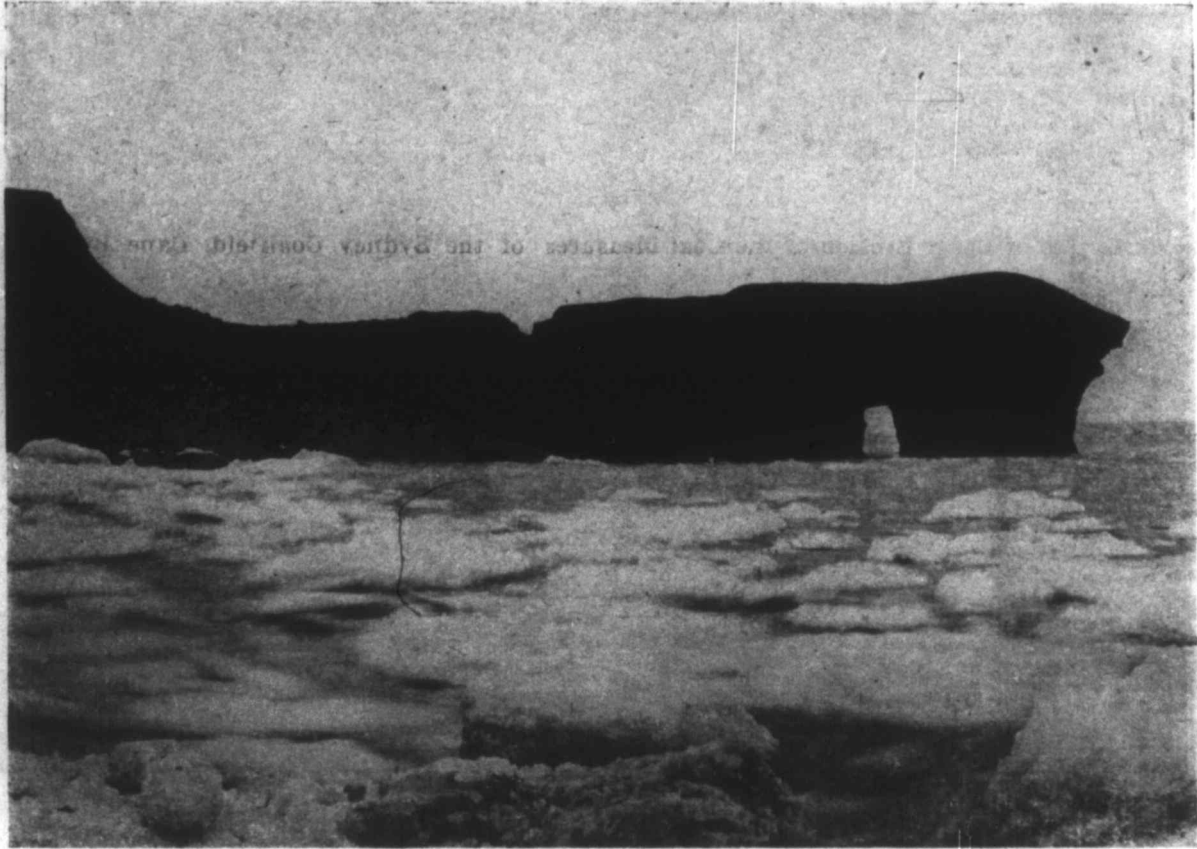
Some Examples of Coast Erosion of the Coal Measures of the Sydney Coalfield, Cape Breton Island.



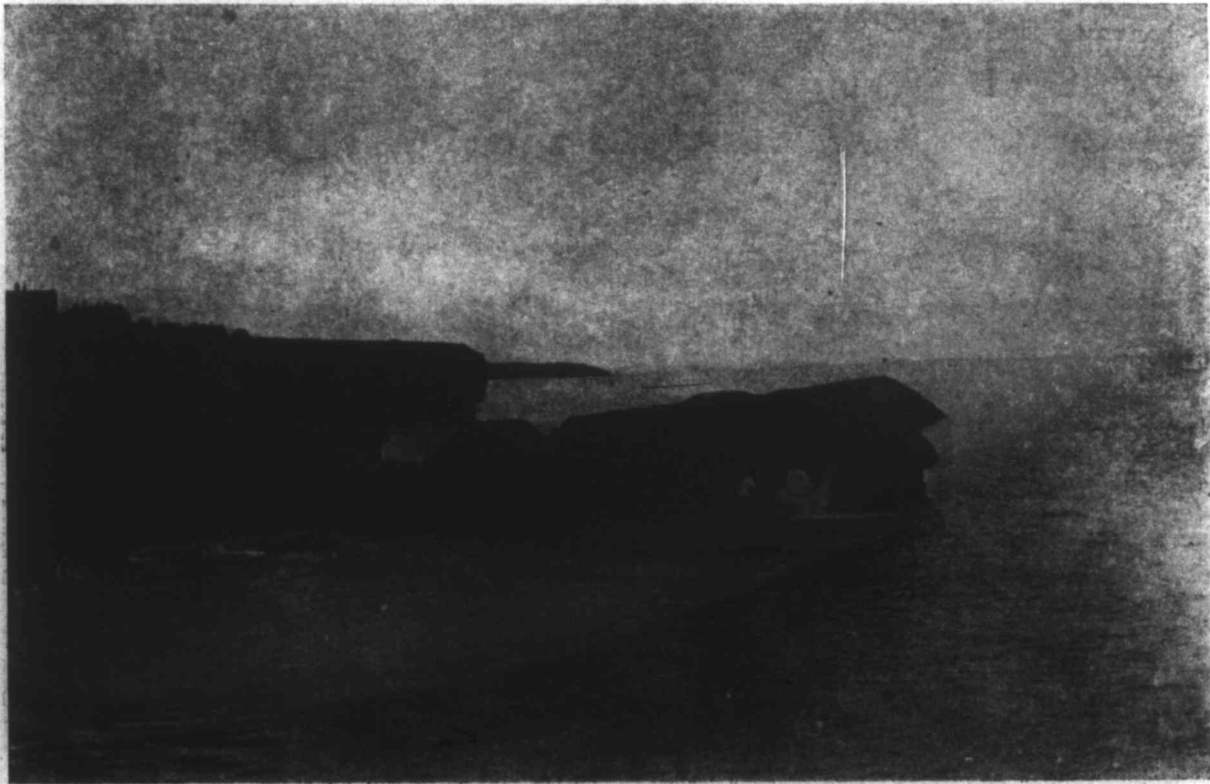
A Sandstone Spur of Strata Lying Between the Outcroppings of the Hub and Harbor Seams, Glace Bay. Photograph dated 1900. Wreck is that of "Napoleon" an iron ship.



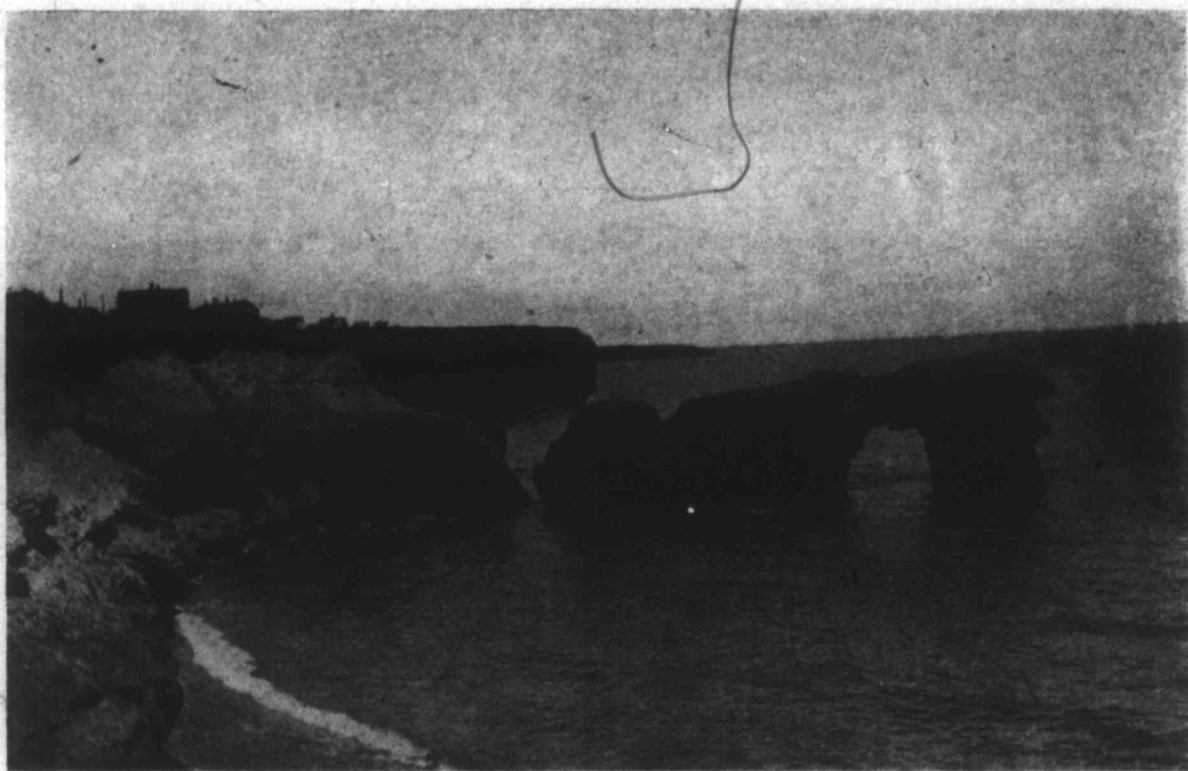
Eight Years Later. Sea has Broken Through the Spur.



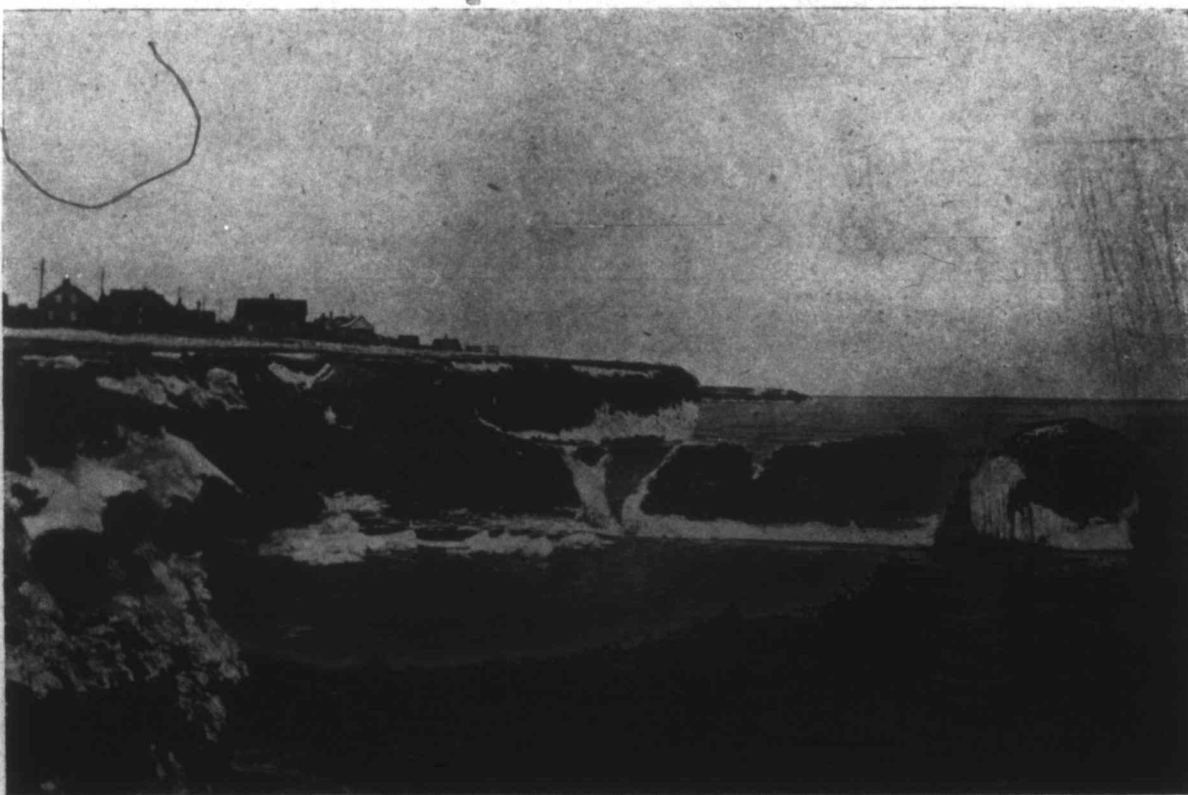
Photograph about 1908. Drift-ice in Foreground. One of the Causes of Erosion in this Neighborhood.



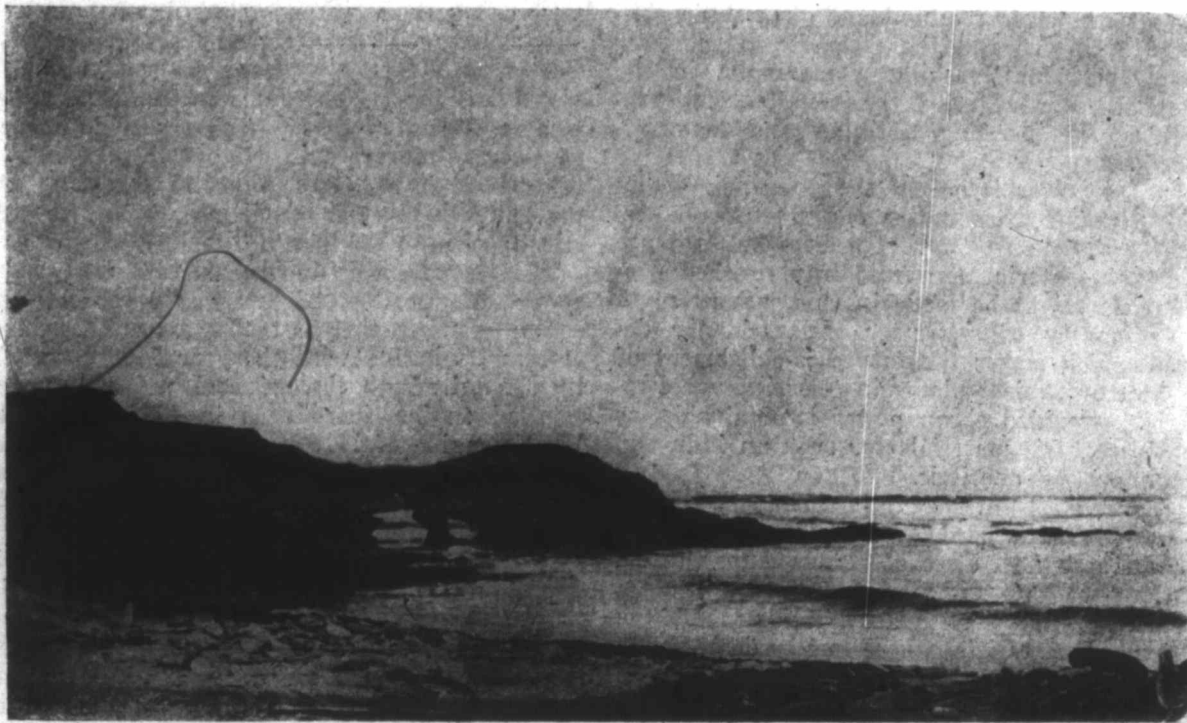
Photograph dated June 1917. Taken by Mr. B. A. L. Huntsman, of Sydney. Coal seam crop in cliff in middle background.



July 1918. Spur separated from land and bridge of sandstone left unsupported.
Photo by Mr. Huntsman.



Winter of 1918-19. End of spur isolated. Notice face with cap on right-hand side of middle portion of original spur. Photo by Mr. Huntsman.



Sandstone spur near Barrasois, New Waterford, midway in the shore-line of the Coal Measures of the Sydney Coal field, Cape Breton Island.

The Importance of Cheap Power to the Industrial Life of Nova Scotia

Presidential Address by Colonel Thos. Cantley to The Mining Society of Nova Scotia, Glace Bay, May 4th, 1920.

Gentlemen:—

Officers, and Members of the Nova Scotia Mining Society, I bid you hearty greeting. The Mining Society of Nova Scotia is entitled to congratulations for the success which has attended its yearly gatherings during past years, and this Annual Meeting now in session in the chief mining centre of our Province, will, I doubt not, prove as important and profitable as any in our history.

The Province also may be congratulated on possessing a Society composed of its leading miners and metallurgists, active men mainly of the class known as practical, men for the most part not only practical, and of seasoned experience, but also of commanding personality, proved ability, with that resourcefulness which practice in mining and metallurgy in a new country, and in some respects an isolated country, demands and creates. Of such is the Mining Society of Nova Scotia—a body for many years composed of men who have perhaps done as much to advance the material prosperity of our native province as any similar group of men, given equal opportunity, have accomplished elsewhere.

In any remarks I may now make it is not my intention to refer to present business conditions, the labor situation, or the present world unrest. All of us naturally must look forward with some misgivings to the future—the immediate outcome of which is uncertain, but as to its final issue I personally have no doubt. Without a League of Nations, or in spite of one, men of the British breed can and will hold their own in the ship, the mine, the field, or the

main. All these our fathers and our sons have worked, wrought, fought and sailed, and in all won the respect of our peers, and we have “aye been provided for and saw will we yet.”

The custom of our Society is that your President should address the Society on some topic of mutual interest, yet pertinent to the community at large. Certainly there is no lack of problems that might with advantage be considered—and equally no doubt there may be many opinions concerning the subject most worthy of attention at the present time.

The mineral resources of the Province and the processes in the mining and metallurgical industry have been dealt with in their many and varied aspects. transportation and labor problems today have the eyes of the world focussed upon them—while familiarity with the laws and operations of high finance and so-called “big business,” not to say mergers, is expected in all well informed citizens, and certainly assumed in industrial executives.

Possibly the most important remaining problem of wide spread concern to industry in Nova Scotia is the production of cheap power. And I have selected it as the subject of my address, treating it from an economic rather than from a strictly professional or technical angle, with a hope of perhaps better orientating our views on the situation in Nova Scotia at the present time. This position in one or more of its several forms, is of vital interest to most industries, which with cheap power may make considerable progress, but under the reverse conditions, will find it diffi-

cult to meet the competition of those more favorably supplied with this necessity.

The amount of power required and the relationship between cost of power and the cost of product vary a good deal, probably reaching a maximum in the electro-chemical industry—and the metallurgical processes used in the smelting, refining and manufacturing of metals.

In these cases power is one of the principal factors and reaches a requirement in the manufacture of certain chemicals of about 5,000 H.P. continuous load per 100 tons of raw material converted into finished product. Reference might be made in this connection to the recent discovery of salt near Malagash, the development of which makes the future establishment of important electro-chemical plants in the Maritime Provinces probable, provided cheap power is obtainable, as salt and coal are basic materials for such an industry, and a most important one it is.

In the electric steel furnace from 200 to 800 K.W. hours per ton treated is used, depending upon the materials charged and the degree of refinement required. Following these we have the more familiar application of power in iron and steel plants, mining and the transportation of materials where mechanical power originally was a secondary factor, but now has become of great importance as a means of increasing production and reducing costs, especially in countries where wages are high. And we find the power consumption amounts to 6 h.p. per ton of pig iron made in blast furnaces, 2 h.p. per ton produced in open-hearth steel furnaces, and 5 to 15 h.p. per ton of steel rolled in steel mills, depending in the latter case largely on the amount of work done in reduction, etc. In the further manufacture of steel into unusual shape, or where tonnage manufactured to any single section or pattern is small, this percentage may be appreciably increased.

In mining, where the power employed is steam and compressed air, the costs cover a wider range, and may reach from 10 per cent of the output for machine operated, heavy pitching, wet coal seams, to 5 per cent where the mining equipment is electrically operated. In metal mines, too, extreme examples may be cited—on the one hand in the case of rarer metals, given outputs of various magnitudes ranging from a comparatively few tons to several thousand per day, frequently located in inaccessible regions, and at points where a supply of fuel is obtainable only with great difficulty. The opposite type is represented by mines producing large tonnages under favorable conditions, such as our iron ore deposits where, on account of the nature of the materials to be mined, and the unusual thickness of the seam, lying at a moderate pitch, it is possible and necessary to use relatively large amounts of power for the operating of mechanical loading, trimming, and haulage equipment. Such a situation may demand 1 to 1½ h.p. per ton mined.

In the field of transportation, we have for land service on steam railways an average figure of 3 h.p. per ton moved, with a fuel consumption of about one-quarter pound of coal per gross ton-mile. At sea one-quarter h.p. per ton moved is required for bulk freight carriers, of moderate size, to one-sixth h.p. for the largest size, with coal consumption of 1¾ and 1½ lbs. per h.p. hour, and 0.045 and 0.032 pounds per ton-mile, respectively.

The principal prime movers in use at the present time are the reciprocating and turbine steam-engines, internal-combustion engine and the water-turbine.

Each has its field of service, and under certain conditions is most economical, which fact must be considered together with its reliability for the service required. By way of comparison, the thermal efficiencies of each type considered as heat engines, may be stated as for modern steam-turbine installations of moderate size, 10 to 15 per cent, and in the case of the largest modern units 15 to 21 per cent. Engines using blast-furnace gas 18 to 26 per cent, while with the full Diesel type of oil engine 33 per cent is obtained, even in small units.

The improvement in thermal efficiency of what is as yet the greatest of our prime movers—the steam engine—during the past 220 years, has been really great. Beginning with the year 1700 Savery's engine then required 40 lbs. of coal per h.p. hour. Newcomens' engine, introduced in 1711, required 55 lbs. Watt's engine of 1778 required only about one-quarter of these amounts, or nine pounds per h.p. hour. The Cornwall engine of 1844 again divided this quantity by three, or to be exact, 3.2 lbs.. Higher pressure and greater ratio of expansion some years later reduced this to two pounds, and in the first decade of this century to 1½ lbs. The turbo generator of 1903 demanded a consumption of about two pounds—fifteen years' study and the outcome of designing experience brought the coal consumption of the turbo-generator in large units down to one and one-tenth pounds, and it would be very unwise to predict that that figure represents finality in that direction.

In Nova Scotia our principal source of power is coal used directly, or indirectly in the form of waste heat from coal in gas fired furnaces, and burned under boilers to actuate steam engines. In the Sydneys, blast-furnace gas might be used to actuate steam engines, while water powers of moderate size are available in various parts of the Province. In some districts use might be made to advantage of oil-driven engines of the internal-combustion type, but it now seems probable that this will be limited to requirements taken care of by small units due to the rapidly increasing price of fuel oil. In view of the efficiency of this type of engine and the other advantages this method of producing power affords, the shortage of fuel oil is regrettable—and a situation already serious is being augmented by the increased use of oil to generate steam in the merchant marine.

As the amount of oil available is far from inexhaustible, and it is a natural resource not replaceable by any known means, we are faced at the present rate of increase in consumption with finding the world's oil reserves depleted before many years, and the problem of finding a substitute is important. Tar, tuluol, and other coal distillation products are now being used to replace natural fuel oils, but while this practice will undoubtedly increase, their source is also circumscribed, due to their being the by-products of coal. What is needed is a fuel capable of replacing them produced from vegetable products. Crude alcohol meets these requirements, and as it may be produced in quantity by systematic cultivation without depletion of natural resources, this problem is one deserving serious attention by governments and departments of conservation.

The situation may in the future be materially relieved by the development of our oil-shale resources, which show marked indications of considerable extent in some districts of this Province, and as they can be mined cheaply, speaking generally, it should be only a short time when these resources will be utilized.

The power of the tides now wasted in the Bay of Fundy, and its tributaries, has received considerable attention from time to time. In our opinion the scheme of this development by the use of two tidal basins is technically practicable, where the land features are such that basins of requisite capacity can be built at a reasonable cost. The initial expenditure would, of course, be great, but so would the power. With the increasing scarcity of fuel and demand for power this source of energy will surely be put to practical use in the future.

In addition to these there are rather indefinite possibilities in the use of peat, which will be of great local value in Newfoundland and elsewhere where there are extensive deposits, when we have learned how to utilize its heat value economically.

While the use of blast furnace and coke-oven gas in internal-combustion engines has been to a very considerable extent tried out, and is still used with success in some localities, such use of these fuels locally seems problematical, especially where the gas can be used to advantage for heating purposes, as the capital expenditure for a gas engine-driven plant of reasonable reliability is very high, and while it is true that the fuel used per unit is still lower than the most efficient steam-driven units, this difference is now very small, as compared with the figures of a few years ago, due to the relatively greater advance made in steam turbines designed for the higher range of steam pressures and superheat; and the higher efficiencies now obtained in the regular boiler room practice where 76 to 78 per cent is maintained without the use of economizers.

Having briefly outlined the probable sources of power, it will be of interest to take up the question of cost production. In consideration of this phase of the question, the cost of electric current-generated by steam power plants will be first taken up, and as we all have, to some extent, a conception of the operating cost of most common units, we will not deal with them other than to point out the marked variation in the coal consumption, which is the principal item.

The average consumption of coal per K.W. hour with compound expansion engines of the best type, condensing, ranges from 2½ to 5½, perhaps 4 lbs. might be taken as a fair average, equivalent to, say, 7 per cent efficiency. In the case of non-condensing engines, simple and compound, such as used for pit-winding and rolling mills and similar class of factory engine, where power is distributed by shafting, ranging from 5¼ to 8 lbs., averaging 6¾ lbs., or an efficiency of, say, four per cent.

Miscellaneous small engines, steam pumps (the former located where power is required all over factory and engineering shops, deriving steam through a long system of pipes) probably take from 10 to 20 lbs. or more, and would not average less than 13 lbs., or, say, 2 per cent efficiency.

The efficiency of the units of the two last mentioned classes is so low that their use should be restricted where possible for more economical means, although there is a field for their usefulness within certain limits in plants using large quantities of low pressure steam for the purpose of heating.

Within the last five years large central steam-driven stations received close study as an important factor bearing on the conservation of coal, and the possibilities of obtaining relatively low cost electric power

from this source has been fully demonstrated in both the United States and England. The unusual size of these stations should be kept in mind, as generators of 20,000 to 45,000 K.W. are used, and units of over 60,000 K.W. are building, indeed, if not now actually operating, and size has a most important bearing on power costs.

With the use of somewhat smaller units the efficiency, while not as high, is closely approached—as is shown from the operating cost of a central station of this class—which has a switchboard cost for the year ending December, 1916, of 0.262 cents, and for a later period of three months of 1917, when coal was more expensive, of 0.360 cents.

In Table No. 1 the first column shows the various items entering into the switch board costs here referred to, and opposite it is a revised cost using native coal at \$5.00 per ton, also allowing for increase in labor and supplies and showing a cost of 0.528 cents per K.W. hour for local conditions:—

TABLE I.

For Three Months Ending March 31, 1917.

| | Expense per K.W. hr. Original. | Expense per K.W. hr. Corrected for local conditions. |
|-----------------------------|--------------------------------|--|
| Superintendence | .009 | .009 |
| Wages. | .050 | .056 |
| Coal | .264 | .418 |
| Lubricants | .001 | .0015 |
| Station Supplies. | .005 | .006 |
| Station Buildings | .013 | .016 |
| Steam Equipment | .016 | .019 |
| Electrical | .002 | .0024 |
| Total | .360c | .5279c |

For year of 1917 corrected column based—

- Labor increased 12½ per cent.
- Fuel increased \$5.00 per ton.
- Lubricants, Supplies, etc., increased 25 per cent.
- Maximum demand (20 minutes), 45,000.
- Average load, 25,300.
- Total K.W. hours, 54,654,900.
- Coal per K.W.—pounds, 1.56 lb.
- Total cost coal, \$144,735.71.
- B.T.U. per K.W.H., 20,300.

Twelve (12) Months Ending December 31, 1916. . .

| | Expense per K.W. hr. Original. | Expense per K.W. hr. Corrected for local conditions. |
|-----------------------------|--------------------------------|--|
| Superintendence | .013 | .013 |
| Wages. | .042 | .047 |
| Coal | .174 | .391 |
| Lubricants | .001 | .0015 |
| Station Supplies. | .006 | .007 |
| Station Buildings | .007 | .0087 |
| Steam Equipment | .016 | .019 |
| Electrical " | .003 | .0037 |
| Total. | .262c | .4909c |

For year of 1916 corrected column based—

Labor increased 12½ per cent.
 Fuel increased \$5.00 per ton.
 Lubricants, Supplies, etc., increased 25 per cent.
 Maximum demand (30 minutes) 36,000.
 Average load, 18,500.
 Total K.W. hours, 162,117,600.
 Coal per K.W., pounds, 1.45 lb.
 Total cost coal, \$262,135.47.
 B.T.U. per K.W.H., 19,800.

These figures do not include interest or depreciation.

It might be well at this point to refer to the differences in cost of power due to variation in local conditions. It will be apparent that high peak loads require reserve generating capacity in proportion to their magnitude, and this condition may apply to boiler capacity also, and when for this reason the ratio of the average station load to short period peaks is low, and we have a low load factor, this results in increased capital expenditure and operating costs. This has an important bearing, as this factor varies considerably under different conditions and a considerable diversity in industries is desirable when locating such a power unit.

The magnitude of the plant, the costs of which we have given ranging as they do to 200 million K.W. hours per year, is considerably in excess of the requirements of our industrial centres at the present time. The consumption of electric current in the Sydney district is, say, about 100 million K.W. hours, while in Pictou County forty million K.W. per year will possibly take care of present requirements. These smaller outputs materially affect the cost of production, and in order to show the extent of this effect the following estimate is submitted to demonstrate what practice might be expected under present day conditions, using local fuels.

Plants of three different capacities are given producing 46, 72, and 126 million K.W. hours a year, and at a switchboard cost of 1.07, 0.903 and 0.877 cents per K.W. hour, respectively.

TABLE 2.
 Station Power Costs.

| Items. | Plant A. | Plant B. | Plant C. |
|--|---------------------------|---------------------------|---------------------------|
| | Costs. Cents K.W.H. | Costs. Cents K.W.H. | Costs. Cents K.W.H. |
| Operating— | | | |
| Labor | .204 | .101 | .065 |
| Material | 1.16 | .756 | .701 |
| Maintenance— | | | |
| Labor | .0411 | .037 | .038 |
| Material | .0784 | .018 | .070 |
| Total Labor | .2021 | .138 | .103 |
| Total Material | 1.238 | .754 | .771 |
| Total Labor & Material | 1.446 | .892 | .874 |
| Other Items | .025 | .011 | .003 |
| Total | 1.071 | .903 | .877 |
| Net output in mill K.W.H. | | | |
| Month | 3.84 | 6.14 | 10.5 |
| T'l power gen. mill, K.W.H. including auxiliaries | 4.04 | 6.21 | 10.6 |
| Lbs. coal per K.W.H. | 3.78 | 2.68 | 2.18 |
| Cost of coal 2,000 lbs. (\$) | 5.00 | 5.00 | 5.00 |
| Load factor Machine p.c. | 49.0 | 59.6 | 64.56 |

| | | | |
|---------------------------|-------|-------|-------|
| Load factor, 15 min. max. | 55.0 | 45.3 | 36.37 |
| B.T.U. per net K.W.H. | | | |
| Output | 43627 | 38289 | 30716 |
| Net K.W.H. per yr. (mill) | 46.08 | 75.26 | 126.0 |

Another source of power might be made available by the development of our water powers. There are within the Province a number sufficiently large which if developed, would provide several moderate-sized if not large units of electrical energy. While some of our larger rivers and a number of smaller streams have not been investigated in detail, the Nova Scotia Power Commission are of the opinion that 300,000 h.p. may be ultimately developed, and if the present programme as we now understand it is carried out, we may have soon installed transmission systems supplying the greater part of the Province, with the exception of the extreme Eastern section.

A considerable section of the public sometimes referred to as the "man on the Street," has a general idea that water power, in view of its being a natural product, provided by Nature and annually replaced, must therefore provide energy at the lowest possible cost. Unfortunately, however, the cost of such industrial power depends upon a considerable number of factors, and none of the energy possible of development at any of our Nova Scotian streams can be made available to the various manufacturing establishments and our towns and villages, except as the result of very considerable expenditures in the way of extensive dams, storage barrages, the installation of expensive hydro-electrical machinery, and a considerable mileage of transmission lines, and while operating expenses in one direction are low, the interest charges are bound to be high and these must be met.

So far as the cost of water power is concerned, we find that the tentative estimates made by the Commission suggest a total cost, including fixed charges and operation of 0.7 cents per K.W. hour for the St. Margaret's Bay development. This plant is now under construction and is expected to supply the Halifax district with a possible thirty million units per year.

Another possible development, and in this case of very considerable importance to Pictou County, is that of Sheet Harbor on East River, St. Mary's. From this development we are advised the estimated total cost of current delivered at a point in the vicinity of New Glasgow would be three-quarters of a cent for a total consumption of thirty million, or 1.10 cents for twenty million K.W. hour per annum. Indeed, it is stated that the output can be increased to 45 million K.W.H. at a cost of one-half cent per unit, when such a hydro system is completed, and tied together in a manner which will permit an exchange of current from one development to another. It is to be understood that these prices are based on delivery in the quantities mentioned at transmission line voltage, to a distributing station, and would approximately apply to a very large consumer, but would have to be increased to cover local distribution in order to serve the smaller industries located in a town using current at lower pressure.

The proposed system will link up many of the towns and pass through agricultural districts of the central part of the Province supplying current at a rate which would materially aid in the development of the country, and increase production along many lines.

A great deal has been written on the subject of internal combustion engines of the Diesel type, burning crude oil, especially for marine work, and certainly oil has many advantages over other kinds of fuel, either when used direct in the cylinder of an engine or by combustion under steam boilers. Unfortunately, we are to a large extent prohibited from its use in recent years on account of its high cost.

In the isolated locations where freighting of coal is a serious expense or storage a determining factor, or in cases where boiler feed-water supply is lacking, there is still a field for its use, and we have under these conditions, a very satisfactory and highly efficient plant in engines of the full Diesel and semi-Diesel type, particularly if they are operating under constant load or very light overloads.

As an indication of the operating cost to be expected in a small plant, we give the following figures from a station with semi-Diesel engines having an output of about 130 thousand K.W. hours per month, where the fuel oil consumption is in the vicinity of .0936 gallons per K.W. hour, or which based on the present cost of oil sixteen cents per gallon in tank car lots, the fuel cost is 1.50 cents per K.W. hour. An engine of the full Diesel type would give lower cost figures to some extent—the difference of the two types being represented by consumption of 0.40 lbs. per B.H.P. hour for the Diesel against 0.50 lbs. for the semi-Diesel type. Greater allowance in both types would have to be made for repairs and maintenance than in the case of steam plants.

The figures given in our estimates of cost are for power delivered at switchboard, which will be increased by distribution cost necessary to deliver the current to the ultimate consumer. Owing to the loss in transmission, cost of equipment and maintenance, this charge will depend on the distance, quantity of current to be transferred, and type of service, and the costs vary considerably. It is usual, however, to have losses of from ten to twenty per cent on power consumed in quantity—while two to five cents per unit is added in the case of current delivered within city distribution system for lighting service.

In estimating the possible saving it will be apparent that two principal classes of power consumers must be considered. First the large independent manufacturer whose requirements are sufficient to warrant operating an independent power plant. The other, the general consumer, dependent on a public course of supply, whose present cost of power probably varies from three to seven cents per K.W.H. It will be apparent that under any unification scheme that the saving to the latter class will be very great.

Some idea of the overall saving that may be effected will be given by the results obtained by the North-east Coast Electric Power Scheme which supplied power to the largest industrial area in England. It is stated that the average price paid this company for current totalling one-third of a million horse-power a year delivered at the customer's terminals, is less than one cent while the coal consumption is 2.06 lbs. per K.W.H. It has been estimated that this latter figure has replaced former coal consumption of 9 1-5 pounds when various industrial establishments now connected with the power scheme generated their own power individually.

As power plays so important a part in manufacturing, it is a factor next only to those of fuel, mar-

ket and transport costs in deciding the location of a factory. At the present time while we have the coal power is relatively dearer in Nova Scotia, and it is only to be had by installing the necessary power plant to meet each individual requirement. This is a decided handicap to the manufacturer starting a new business, and at best gives very expensive power. It surely is apparent that if manufacturing in Nova Scotia is to develop in a satisfactory degree some effort must be made to improve the situation.

From the figures already given it is evident that large production of power is essential to low costs, whether steam or hydro-electric, and the fact that large central steam plants are now being worked and others developed in the United States and Great Britain confirms this view. Here, as in most cases of human endeavor, unity is strength, and need for all working together is self-evident.

It is important in this connection that all power users should, where possible, employ electric equipment of the same frequency. Unfortunately, this is not the case today, as in two instances in this Province we have practically adjoining districts using current which is not interchangeable without the use of frequency converters, and in this connection it is worth mentioning that the Nova Scotia Power Commission proposes using 60-cycle generating equipment in their various developments. While differences in voltage is not so serious, it should also be given consideration, and limited to as few standards as is economically possible. Standardization would also simplify the local supply of electrical equipment and make neighbors a more dependable friend in the day of spare part troubles.

Some of the larger companies in the Province have a surplus of waste heat or electric generating capacity or both, and could supply power to manufacturers in their locality at a comparatively low cost. Power sold in this way would tend by increasing total production to reduce the cost per unit, and such a policy would have the effect of stimulating the growth of associated subsidiary and smaller trade in the community, and in time build up an important market near at hand.

The situation in this Province from a manufacturing point of view is in some important, if not vital, respects far from favorable. We are situated far distant from the chief consuming centres of the Dominion, and while the cost of transport per ton-mile in the past has not been high, the distances involved have been so great as to make the transport cost a very large factor, particularly in the case of coal and heavy manufactured products, such as iron and steel. During the past few years the cost of railway operation has very largely increased, and is still advancing, and there is little reason to hope for much improvement in this connection.

If Nova Scotia is to advance along manufacturing lines and so provide employment giving a satisfactory return both to labor and capital employed, it is absolutely essential that power be supplied not only to our large but also to our smaller manufacturers, at rates at least as favorable as those enjoyed by like industries in the other Provinces of the Dominion.

A really economic national policy must be based on the necessity of using our coal for such forms of work as cannot be performed with other sources of energy. While our coal reserves are large they are not inex-

haustible, and after that section of our deposits which are immediately available is worked out, the cost of production will increase as our mines and workings become deeper and more extended. The question of man-power necessary to work over the greater and more extended areas of production, when the deposits near the surface are exhausted, is another factor which cannot be overlooked. In view of these considerations we must so far as possible obtain our supply of energy by increased development of hydro-electric generation of power, reserving our fuel supplies for the reduction of our iron and other ores, and the purifying treatment and manufacture of metals, which cannot be accomplished save by the agency of heat, whether this be supplied by solid or gaseous fuel.

To this end all should work together to improve the situation, and to enlist public interest in this subject of vital importance—which we gladly note is now commanding the attention of the Government of this Province, with, we trust, the likelihood of helpful results.

PAYMENT OF BRITISH EXTERNAL DEBTS ADVOCATED IN GOLD COIN.

Mr. Francis A. Govett, Chairman of the Ivanhoe Gold Corporation, in his speech to the shareholders at the Annual Meeting in London, May 3rd., expressed some unusual opinions regarding the status of gold. Among other remarks he stated "the notes issued (British notes) are only really backed by gold so long as gold is not seriously demanded, but in times of panic or serious danger, either the Bank Act is suspended, or the convertibility at once suspended. That is to say the gold backing for the paper is entirely Christian Science, you can get gold for your paper only so long as you do not want it."

Mr. Govett's conclusions were as follows:—

"Gold has rendered good services; it has provided a most convenient common measure for the internal exchange of all commodities, and for international exchange, there being a fixed amount of fine gold in the unit coin of any country. This being so convenient, it is absurd that complications involved by the use of silver as a collateral basis of exchange should be tolerated, or that any country should remain on a silver basis; still more absurd that any of these countries should be a country, within the British Empire, like India, Ceylon and East Africa. (Hear, hear.) We cannot compel China to come in, but there should be a uniform currency for the Empire, with its base the British sovereign. It does not matter what may be the denominations of the subsidiary token coins so long as they are really tokens and not, like the rupee, a coin of value above 2s, and possibly a token when silver falls below. Internally the use of gold itself as pocket coinage is most extravagant, for six years past we have done well without it, and I have shown that in practice it is never used in times of need for one of the purposes for which it nominally is available, the backing of the note issue in circulation. To me it seems, then, better to recognize the actual facts, that the note issue are not backed by gold at all, but rest on national credit; to confine the use of gold to the sole function of the adjustment of international indebtedness and actually to use it when it is wanted; that is to say, instead of hoarding the useless gold in the bank vaults, it should be used in paying our external debts at 4.86, instead of our buying bills, as we have done, as low as 3.20 at a heavy loss, which means that we were paying 40 per cent to 50 per cent more for what we buy and increasing our indebtedness by that amount. Take the whole of the gold and hurl it at them; one of two things will happen—either the exchange will immediately rise in their unwillingness to take gold, or they will take it, and we shall have saved some further debts, and then we shall be no worse off than at the present moment, and at least we then shall know where we stand, for we shall be back on the real basis of our national credit, when perhaps at last we may begin to grasp the facts and to economise a little, while the internal credit of the Bradbury will still be unimpaired."

NOVA SCOTIA NOTES.

Colliery Doctors and the Workmen's Compensation Board.

The colliery doctors in Cape Breton refuse to make out the accident returns which the Workmen's Compensation Board require to establish the claims of the injured workmen, alleging that to do so entails a great amount of clerical labor for which they receive no compensation. The Board states it is not empowered to pay the doctors for doing this work, and that it cannot make payments of compensation without the certificate of a physician. As the colliery doctors are paid by the workmen, who contribute a monthly sum, in the neighborhood of a dollar per month, to the doctor of their choice, through the medium of the colliery payrolls, the workmen naturally consider the certificate of injury to be of a service included in the monthly deduction for doctor's services. The Compensation Act contains the following provision, namely; "It shall be the duty of every physician in attendance upon any injured workman to give all reasonable and necessary information, advice and assistance to enable such work or his dependants to make application for compensation, and to furnish such proofs as may be required by the Board." It is very much to be doubted whether such a statutory provision is enforceable, because nothing is said regarding the payment of the doctor for the services asked, and it is generally understood that no services can be commanded under a statute of this nature for which remuneration is not made in some form or other. The Board is probably correct in demanding medical certificate of injury, but this it requires only for its own satisfaction. Someone, however, should pay the doctor. It is a generally accepted principle of Workmen's Compensation Act as recently enacted and amended that the workmen himself shall be put to no charges for medical aid, and there is no good reason why the workmen should be asked to bear the cost of whatever charges the doctors may consider cover the work entailed by making out the compensation returns. It is probable the doctors are making much of little, and that on the other hand the Compensation Board is asking something for nothing. It is also possible that the returns which the doctors are asked to fill out are unnecessarily detailed, and that if the doctors were asked to certify returns already made out and requiring only a signature for completion, the dispute could be compromised without the necessity for paying a fee to the doctors. The vagueness of the provision above quoted from the Act, and the duty required from the doctor without specification of his remuneration was certain sooner or later to raise a question. "Such proofs as may be required by the Board" is a phrase capable of indefinite extension according to the interpretation placed upon it by the Board.

METAL QUOTATIONS.

Fair value for ingot metals at Montreal, 27 May 1920.

| | Cents per lb. |
|---------------------------|---------------|
| Electric Copper | 24 |
| Castings | 23½ |
| Lead | 10¼ |
| Zinc | 11 |
| Aluminum | 38 |
| Antimony | 12 |

OUR NORTHERN ONTARIO LETTER

The Silver Mines.

At the time of writing, silver quotations appear to have become fairly steady at a fraction below \$1 an ounce. This is believed to be due to the United States having entered the market to replenish its somewhat depleted treasury supply of the metal. Opinion now is that as the United States, according to the Pittman Silver Bill, is to replace more than a quarter of a billion ounces previously sold which must be repurchased at not more than \$1 an ounce, the price may be expected to show no further serious decline. Outside buyers, therefore, would be obliged to bid over \$1 to get the market. This is pointed to as indicating at least \$1 silver, plus the rate of exchange on New York funds at present around ten per cent, leaving the mining companies of this country still in a favorable position.

Work at the Temiskaming mine is one of the most favorable factors in recent months in the Cobalt district. Less than two years ago the ore reserves were pretty well depleted and the mill was closed down, while today, as a result of an aggressive and wisely directed exploration campaign the mill is treating ore at the rate of 135 tons daily, the highest record of the Temiskaming. A considerable quantity of the ore is high grade. A further indication of the expectation of the management and directorate that the mine has a big future ahead of it is that at the present time the company is installing silver refining equipment of its own in the present mill. These facts, taken together with the knowledge that the present surplus is over \$900,000 and may be approaching \$1,000,000, offer reasonable indications of steady dividends from this date forward.

At the Beaver Consolidated, the low cost of treating the ore is enabling the company to maintain its earnings, while the recent leasing of the Prince property, and the probability of also acquiring the Badger offers fair promise of operations being still further enlarged.

Combined, the Beaver and the Temiskaming mines lend an importance to that part of the Cobalt field, which, with the other smaller operations now getting under way, is fully maintaining its place as one of the most productive parts of this rich silver field.

Normal conditions, or at least conditions to which the mines have become fairly familiar, prevail in Cobalt, with the one exception of a labor supply slightly below requirements. That this shortage will continue for the summer seems probable. An indication of this is shown in the presence this week of a representative of the international Nickel Company who is in Cobalt to engage all the drill-runners he can at a wage somewhat higher than that being paid locally. Whether or not the mining companies of Cobalt will be content to work at a slightly reduced capacity by maintaining the present wage and bonus schedule or will also enter into competition with outside industries is not yet clear. Just now opinion appears to be more or less divided on this phase of the situation.

The Cobalt Radium Syndicate, made up of a number of Cobalt men, has engaged men to explore the surface of property held in the township of Butt in the near vicinity of the radium-bearing ore discovered in that district last year. The Syndicate holds six mining claims in that area.

In connection with the proposed light railway from Elk Lake to Gowganda, the Bill has passed its third

reading, and it is learned that the Northern Light Railways is making a bond issue of \$300,000 in denominations of \$1,000 bearing interest at 7 per cent with a bonus of one share of common stock per \$1,000 bond. The company is capitalized at \$500,000 made up of 5,000 shares of the par value of \$100 each. In addition to the mines already in operation, more than a dozen other property owners have signified their intention to commence work just as soon as rail transportation is provided. The promoters of the enterprise are confident of success. Indications are that other work in the district, particularly lumbering will provide additional freight revenue. The Bill to establish The Mining Court of Ontario bids fair to pass, and may become law in September. The proposal has met with quite general favorable comment throughout the mining districts.

Sir Clifford Sifton, together with Geo. Glendenning has just concluded a visit to the Bonsall property in the Gowganda district. It is understood arrangements will be made to operate the property if rail transportation is actually provided this year.

The Coniagas Company is proceeding with the preliminary working connection with exploring their recently optioned property in the Gowganda field. A road is being cut, and camps erected preparatory to taking on miners.

Ore and Bullion Shipments.

During the week ended May 21st, five Cobalt companies shipped an aggregate of ten cars containing approximately 776,648 pounds of ore. The Nipissing alone sent out four cars containing 356,424 pounds.

Following is a summary:—

| Shipper | Cars | Pounds |
|------------------------------|-----------|----------------|
| Nipissing | 4 | 356,424 |
| Mining Corporation | 3 | 199,409 |
| La Rose | 1 | 83,416 |
| Beaver | 1 | 72,799 |
| Right of Way | 1 | 65,800 |
| Totals | 10 | 776,648 |

During the corresponding period the Nipissing made one shipment of bullion, sending out 74 bars containing 100,416.48 fine ounces. This is the first shipment of bullion to be made since March from the Nipissing.

Arthur A. Cole, Mining Engineer, has issued the following statement of ore shipments over the T. & N. O. Ry., for the month ending April 30th, 1920:—

Silver Ore.

| Cobalt Proper. | Tons of 2,000 lbs. |
|---------------------------------|--------------------|
| 1. Coniagas | 118.00 |
| 2. Dominion Reduction | 32.50 |
| 3. Hudson Bay | 30.76 |
| 4. La Rose | 105.17 |
| 5. Mining Corporation | 423.52 |
| 6. McKinley-Darragh | 94.59 |
| 7. Northern Customs | 65.20 |
| 8. O'Brien | 104.17 |
| 9. Peterson Lake | 30.00 |
| 10. Temiskaming | 78.33 |
| | 1,082.24 |

The above shipments were made to the following Companies:—

Canada.

| | |
|---|--------|
| Deloro Smelting & Refining Co., Marmora | |
| Deloro | 759.95 |
| Coniagas Reduction Company, Thorold . . | 183.09 |

United States.

| | |
|--|--------|
| American Smelting & Refining Co., Pueblo | 139.20 |
|--|--------|

Note.

| | |
|---|---------|
| April 6th. Highest price of Silver during month | 127.000 |
| April 30th. Lowest price of Silver during month | 111,500 |
| Average price of Silver during month | 119,779 |

The Gold Mines.

The expected relief in the way of labor supply has not materialized in the Porcupine gold area, and the mines are all still operating under this handicap. In spite of this, however, the earlier prediction of the Ontario Bureau of Mines that the output for 1920 would set a new high record promises to be fulfilled. According to figures now being prepared, the production from January 1st to May 31st will about equal that from January 1st to June 30th during the previous year.

Ore being treated at the Hollinger Consolidated has been reduced to around 1,700 tons daily, as compared with an average of 1,950 tons during 1919, and compared to 2,200 tons monthly earlier during the current year. The performance, therefore, at the Hollinger promises to about equal that of the preceding year, and tends to show that the increase in output from the Camp as a whole will be due to the operations of the Dome and Porcupine Crown, and, also, to an increase at the McIntyre-Porcupine.

The question of increasing dividends on the Hollinger was shelved at the annual meeting of the company. Shortage of labor is stated officially to be the only reason why the dividend could not be increased to one per cent every four weeks, or 13 per cent annually. At the same time, some of the shareholders have expressed the opinion that the company could continue its present policy of paying one per cent every eight weeks, with one extra at the end of each year or a total of seven per cent per annum, and in addition to this pay an extra of one per cent in July of each year and thus increase to a return of 8 per cent interest instead of 7 per cent as at present. As to this, the fact that no action was taken at last week's meeting would indicate no change until perhaps the end of the current year.

Following are the directors of the North Crown Porcupine Mines, Ltd., the newly incorporated \$3,000,000 company which takes over the combined Porcupine-Crown and Thompson-Krist properties;—Sir John Carson, president of managing-director; J. R. L. Starr, K.C.; Wm. I. Gear; J. B. Bertram; Percy Galt, K.C.; James G. Ross, C.M.G.; James Cooper; A. G. Gardner; and Ziba Gallagher. Messrs. Starr, Bertram and Galt represent the Thompson-Krist in the new merger, while the remaining six are original members of the former board of the Porcupine Crown Company. The North Crown begins its career as a going concern, with \$30,000 in its treasury and mill in operation treating ore at a substantial current rate of profit.

The Clifton-Porcupine, as a means of overcoming labor shortage has decided to engage diamond drills for exploration work. Following up its policy of keeping its shareholders fully informed as to progress and results achieved, the Company has issued a quarterly statement, dated May 19, as follows:—

Since our last report, dated February 19th, was mailed, considerable progress has been made in the development of your property.

On the 200-foot level a crosscut has been driven East for 160 feet. Nos. 7, 5, 6 and the Boulder Veins have been encountered in this crosscut. The first three have increased in width, while the Boulder vein has shown a tendency to split up on the first level. The same high values encountered on surface and on the first level, persist at this greater depth, considerable free gold being in evidence in the vein material.

70 feet of drifting has been done on No. 7 vein, both North and South of the shaft, with good results. A crosscut has been run west for 90 feet, but at the date of writing, the objective—No. 8 vein—has not been reached. 125 feet of drifting has been done on No. 6 vein North, with the object of proving the values in this vein and of reaching the contact area which lies North of our present workings. In this contact area, we are advised by our Consulting Engineers, lies our best possibilities of an increase in size of our ore bodies. It is significant that at every producing mine in the camp, the largest ore bodies lie in reasonably close proximity to the contact between the keewatin and porphyry rocks.

The labor situation is a hard problem to solve. Employees of the mines, lured by equal or higher wages in less hazardous occupations, have been leaving the mining districts in considerable numbers. The gold mines, with a fixed price for their finished product, have advanced wages to the highest possible point, in spite of which they have found it impossible to compete with other employers for the necessary labor to operate at the highest efficiency.

All of the mines have been affected by this situation. The larger mines have found it necessary to curtail operations to some extent, while the smaller mines have been affected in even greater degree. We have found it almost impossible to replace the skilled workmen who are leaving.

For these reasons, your Directors deem the present an opportune time to carry on an extensive diamond-drilling campaign recommended by our Consulting Engineers. Contracts for several thousand feet of this work will be immediately let on tenders in hand, and the work will start as soon as the drills can be moved to the property.

The results of this drilling will provide us with information as to the size and depth of the ore bodies that will make it possible to carry on the further development of the property in the most efficient and economical manner.

Announcement is made that property owners in the Boston Creek district are making arrangements to engage the services of Alfred R. Whitman, mining geologist, to make a study of the geological structure as revealed by mining to date. The work is to be done with the full cooperation of the property owners interested, and will include a very careful examination of the Miller-Independence mine, now working at a depth of 500 feet, and the Mondeau, where work is being carried on at the 250-ft. level.

Tenders are being called for the sale of the assets of the Kirkland-Porphyry Gold Mines, including several unpatented mining claims in the township of Teck in Kirkland Lake, and also a lease on the Orr Gold Mines. It is learned from usually well-informed quarters that there is likelihood of early resumption of work on the Orr property. It is intimated that the differences which arose between Hamilton B. Wills and the Wettlaufers of Buffalo are being so adjusted as to make it possible to resume work on the promising property. The Orr lies adjacent to the Kirkland lake as well as the Teck-Hughes mine, and has a substantial tonnage of good grade ore already blocked out.

On the Fidelity property in the township of Teck, the main shaft has reached a depth of 192 feet, and is being driven at the rate of about 80 feet a month, indicating that the 300-ft. level will be reached by the early part of July.

The shaft is being driven on an incline, following the vein. It is stated the main vein continues quite uniform in width, and that a small vein measuring about four inches in width has come in along the foot-wall side of the shaft.

The first or 100-ft. level has been reached at the Bidgood property in the Lebel township part of the Kirkland Lake gold area. The vein is stated to have dipped north out of the shaft at a depth of about 65 feet, and a crosscut consisting of a round or two of shots is being driven to intersect the vein at the 100-ft. level. Sinking is proceeding at about 100 feet a month at the Bidgood, inclusive of timbering. In addition to cutting a station at the 200-ft. level it is thought the shaft will reach the 300-ft. level by the last week in July.

At the Kennedy-Boston, the newly installed mining plant is now in operation and the deepening of the former 100-ft. shaft has commenced. The shaft is down 120 feet, and it is officially announced that the vein which dipped north out of the shaft at a depth of about 60 feet has come back into the shaft at a depth of 112 feet where it measures about three feet in width and is highly mineralized, with visible gold.

Mining claims Nos. 4655 and 4656, situated in the township of Skead, between the Manley property and the Wisconsin-Skead Gold Mines have been purchased by a syndicate from Niagara Falls.

The deal is stated to have been arranged by A. C. Thorburn, and arrangements have been made to commence work at once. It is proposed to spend about \$2,000 in determining the most suitable place for the commencement of underground operations.

BOOK REVIEWS

PROSPECTOR'S FIELD-BOOK AND GUIDE. By H. S. Osborn. Revised and enlarged by Mr. W. Von Bernewitz. Ninth Edition. 4 $\frac{5}{8}$ by 7 $\frac{1}{8}$ ins. 400 pages. Flexible Fabrikoid backs, designed for pocket use. Price \$3.00. Henry Carey Baird & Company, 2 West 45th St., New York.

This volume is a completely reset and revised edition of the issue of 1910. The information regarding ore occurrences outside of the United States is fuller and more correct than is often the case in New York publications and Canadian references, particularly in the new chapter on alloy minerals, are reasonably accurate. The chapter on petroleum, asphalt and oil-shales contains much information in condensed space.

The introduction to the work gives preparatory instruction in elementary geology, the use of the blow-pipe ore analysis and surveying, and the work emphasizes that "the search for ore deposits is becoming a specialized profession, and those that keep this fact in mind are the ones most likely to benefit by it."

From a United States viewpoint, the list of minerals and metals prepared by C. K. Leith of the U. S. Geological Survey is interesting, as showing to what extent the United States is self-sustaining in minerals supply. Minerals which our neighbours must import include nickel, mica, graphite, asbestos, and cobalt, all found in Quebec or Ontario.

The book appears to be well worth the price asked. It is well bound and adapted for pocket use. The condensed accounts of ore occurrences throughout the world constitute one of the most valuable features of this book.

The revisor has had practical mining experience in New Zealand, Australia, Dutch East Indies and America, and, judging from the Canadian references, his facts are reliable.

BRITISH COLUMBIA LETTER.

Hazelton, B. C.

J. D. Galloway, resident mining engineer, has returned to take charge of the season's government operations in his district. He states that much road and trail work is planned to assist in the opening up of mining properties on Hudson Bay Mountain, on Driftwood Creek, and in other sections of the wide area covered by the Northwestern Mineral Survey District of the Province. Mr. Galloway intends making an early inspection of placer mining in progress in the Cariboo and hopes later on to be able to arrange to make a trip of inspection into the Peace River Country. The examination of a group of mica claims near Tete Jaune Cache is proposed at an early date, the owners having in mind the opening up of the deposits on a large scale, it having been shown that the mica yield is of as fine a quality as can be secured on the North American Continent.

Stewart, B. C.

The Provincial Government, as a result of recommendations made by George Clothier, President Engineer for the District, proposes the expenditure of a substantial sum this year in further opening up the Salmon River mineral area, as well as the zone north of the Portland Canal Mining Division. The wagon road, built last year to the Premier Mine will be continued and trails will be constructed to assist both operators and prospectors. In order to make easier the recording of mineral claims staked in this country the whole of the region where are found the head-waters of the Naas, Unuk, and Iskut Rivers has been included in the Portland Canal Mining Division so that hereafter prospectors will travel along the line of the Salmon River, making use of the trails mentioned, to Stewart to make official record of their claims and assessment work. The change simply means that an imaginary line has been drawn by the Department of Mines from Mount Brown to a point where the 56th parallel intersects the eastern boundary of the Omineca and Naas Mining Divisions which throws all that part of the Naas Division lying to the north of this line into the Portland Canal Mining Division. The section to the south of this line will be administered as before from Anyox, where there is a mining recorder. Previously it was thought to be easier to reach Anyox from the head-waters of the Unuk, Naas and Iskut Rivers that to get to Stewart owing to the intervening coast mountains. Recent exploration in connection with the opening up of the Salmon River zone, however, has proved that a comparatively good pass exists and that, with the development of the past two years and that underway, prospectors will be better able to get to Stewart than to Anyox.

Kamloops, B. C.

The report that diamond drilling operations on the Aspen Grove Group of Mineral Claims had been suspended indefinitely has been denied by J. H. Bate, one of those interested in the property. He asserts that powerful machinery is being installed and that a programme of exploration and development has been prepared that is likely to take two or three years to complete.

Cranbrook, B. C.

A copper deposit has been located on the Skookumchuch River, about thirty miles from Cranbrook, which

is said to have exceptional merit. Development work to a depth of about 40 feet is announced to have shown up a considerable body of high grade ore. The property has been bonded by Dan McIntosh, a well-known mining man, for \$15,000.

Kaslo, B. C.

At the annual meeting of the Utica Mines Ltd., it was decided to decline an offer received for a controlling interest in the property.

Barkerville, B. C.

L. A. Bonner, manager of the Lightning Creek Hydraulic Company, Cariboo, who returned recently from a business trip to England, states that the season in northern British Columbia in respect of placer mining is extraordinarily backward. A few weeks ago he snowshoed into his property over four feet of snow and expects that later on trouble will be experienced through freshets. Mr. Bonnar looks for a greater output of placer gold from the Cariboo this season notwithstanding the handicap which the operating companies face owing to the scarcity of labor.

Vancouver, B. C.

A mining property known as the Opporgol, situated on Howe Sound, a short distance from Vancouver City is attracting considerable attention as recent development, financed by a syndicate of business men of Vancouver, is reported to have brought ore to light carrying gold, silver, and copper values. The first work done at elevation of 1500 feet and in the initial forty one feet of cross-cut four veins were cut ranging from 2 1-2 feet wide. Between the veins is a replacement of the same character and values as in the veins. The ores in the cross-cut are reported to have averaged \$8.51 a ton. Both copper and lead occur in sulphides. At sea-level another adit was run opening up the ore vein. The company plans to instal a couple of drills, an air-compressor, and an hydro-electric plant, power for which can be secured from any one of several waterways in the vicinity. The property is most advantageously situated for operation as it can be worked from a portal practically at sea-level.

New Denver, B. C.

The strike of metalliferous miners of the Slocan Silver Mining Camp of this Province has been settled, the operators at a meeting held recently having decided to grant the men an advance in wages amounted to practically 75 cents a day. The mines ascribing to this agreement include the Roseberry-Surprise, the Noble Five, the Cunningham properties, the McAllister, the Carnation, the Lincoln, the Rambler-Cariboo and the Standard. There has been little work done on any of the properties mentioned since the 1st of May. It is understood that the Silversmith Mine at Sandon compromised with its men before the general readjustment was arrived at, allowing its men 50 cents a day increase in wages and blankets.

Victoria, B. C.

It is announced that the issue between the Taylor Engineering Company and the original Dolly Varden Mines Co. which threatened to develop into long sustained litigation through the courts of Canada has been settled. Under the terms of the agreement the Taylor Company, who are in possession of the Dolly Varden Mine and all the plant in connection therewith,

undertakes to pay a debt of approximately \$613,000 without delay. This charge was an incumbrance against the property in favor of the first owners, and those who accorded them financial assistance, but it was not specified that the amount should be paid over on any particular date. The settlement, therefore, means that the obligation will be discharged at once and that the Taylor Engineering Company will be allowed to retain possession and to operate the mine without further molestation, the agitation in progress for some weeks at Ottawa for the disallowance of legislation passed at the last session of the Provincial Legislature being discontinued.

B. C. GOVERNMENT CONSIDERING ESTABLISHMENT OF IRON AND STEEL WORKS BY THE PROVINCE.

The Hon. Wm. Sloan, Minister of Mines for British Columbia, in an address on the second reading of the Bill to extend the operative period of the Iron Ore Bounties Act until 1925, said with reference to the much debated possibility of an iron and steel industry in the Province:

"That the Government has received many applications from various quarters for substantial support in the launching of this industry. All these applications have been given careful consideration, but in every instance it has been found that the individuals or corporations concerned, required that the Government enter into financial responsibilities of a very serious nature, in many instances to the full financial requirements of the enterprise. This, it will be appreciated, would involve a binding obligation not lightly to be undertaken under the conditions with which the Province has been faced during the past few years. For this reason consideration has been given the question of whether it would not be the best policy of the Government itself to lead the way to the establishment of an industry for the manufacture from our iron ores of commercial iron and steel rather than finance private enterprise to do so.

Province will take the initiative.

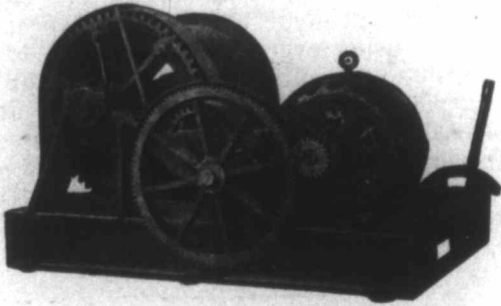
"It is proposed therefore," continued the Minister, "that should no more favorable terms be submitted by private enterprise to assemble full and complete data, having special reference to the recent important discoveries of hematite ore in the Whitewater district, all with a view of considering the undertaking by the Government of the establishment of an iron and steel industry at an early date in the Province of British Columbia, thereby paving the way to the obtaining for our Province what is recognized as the basis of all industrial enterprise."

Government is Determined to Grant Every Encouragement to Iron Industry.

"The bill before the House," he continued, "is merely one of a series of measures each of which, directly or indirectly, has the same object. Others that may be instanced are the Mineral Survey and Development Act and the Iron Ore Supply Act of 1919. The former furnishes the machinery through which more detailed and accurate information regarding our mineral resources—and our iron ore bearing areas are in an important part of these resources—may be obtained. In passing I may say that it has served and is serving this purpose."

A MARSH HOIST IS MADE THE RIGHT SIZE FOR YOUR MINE

and in either Steam Power or Electric Power



This shows one of our Electric Mine Hoists. We make many other types. Send for our catalogue of Mine Hoists, Cars, Cages, Buckets, etc., and see what we offer you. It will repay you.

From the little 10 Horse Power size for prospectors or small mines to the massive 50 Horse Power size, one of our 7 sizes should be just right for your mine.

We are specialists in the building of Hoisting Machinery of all sorts. For nearly a quarter of a century we have been designing and building Hoists, and have developed a Hoist that we are really proud of—proud because of the record of good work they have done, and are doing in mines, quarries, and other classes of work from one end of Canada to the other.

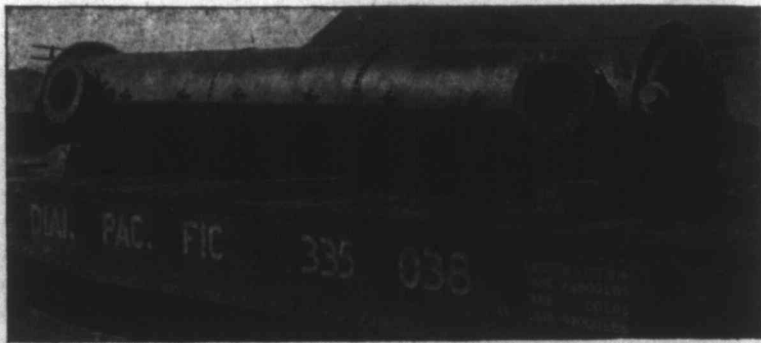
MARSH ENGINEERING WORKS, Limited

ESTABLISHED 1846

BELLEVILLE, ONTARIO, CANADA

Sales Agents:—MUSSENS, LIMITED, Montreal, Toronto, Winnipeg and Vancouver

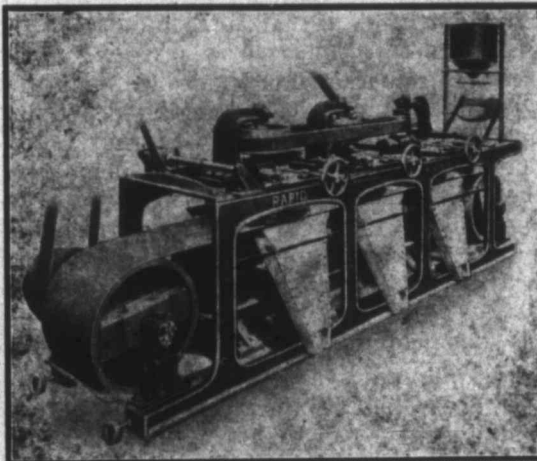
STEEL PLATE WORK OF ALL KINDS FOR MINES—Particularly



AFTERCOOLERS
AIR RECEIVERS
SKIPS
ORE BUCKETS
MINE CARS

MacKinnon Steel Co. Limited
SHERBROOKE, QUE.

Montreal Office: - 404 New Birks Bldg.



"Rapid" Electro-Magnetic Ore Separators

(THOMPSON-DAVIES PATENT)

For the separation of feebly magnetic ores and ores consisting of particles of different magnetic permeability.

SIMPLE IN OPERATION.

All tuning up may be done whilst machine is working.
NO FLIMSY CROSS BELTS.—AN ABSOLUTE MINIMUM OF DUST.
EVERY PART IS EASILY ACCESSIBLE.

Separating Magnetics may be set finer than any other machine on the market.

Invented and built in Britain by

THE RAPID MAGNETTING MACHINE CO., LTD.

(No duty to Canada)

BIRMINGHAM, ENGLAND.

SEND FOR CATALOGUE

Canadian
Agent—

The Dominion Engineering Company
119 LAWTON AVENUE, TORONTO, CANADA

By those who had been and were concerned in the establishment of an iron and steel industry Mr. Sloan wished it to be understood that the Government was behind them to the full extent of its power having regard to the serious financial obligations of the country and to its responsibility as the representatives of the taxpayers and electors of the country. The Government was sincere in its determination to help those whose enterprise and confidence in the future of the Province had induced them to take up the task of launching the industry which, everybody was agreed, would mean the opening of a new, a broader and a more prosperous era in the commercial and industrial development of British Columbia.

The Whitewater Discovery.

"Possibly the most noteworthy of recent events bearing on this subject," recalled Mr. Sloan, "is the discovery of large deposits or what are described as limonite and hematite ores in the Whitewater River section of the Lillooet Mining Division. When information was received regarding the existence of these bodies of iron ore Wm. M. Brewer, one of our mining engineers, was instructed to proceed to the district to make an examination and submit a report thereon. This he did last summer. While Mr. Brewer was unable to make a full and complete inspection he was able to see and to satisfy himself of enough to demonstrate that the field merits the very closest examination in the public interest. Mr. Brewer places himself on record as estimating the 'actual ore' at 7,200,000 tons, the 'probable ore' at 15,000,000 tons, and the possible ore' at 50,000,000 tons. Assays of the ore show it to be of high commercial value.

Steps Taken.

"Recognizing the importance of such a deposit," said the Minister, "the Department of Mines immediately took steps to interest the Geological Survey of Canada. Through Charles Camsell, its western representative, the services were obtained of S. J. Schofield, who proceeded to the district to make a further report. His party, however, was too late to make any extensive investigation. In the meantime, through the instrumentality of the Department, a reconnaissance of possible route of transportation from the Whitewater District to the coast has started, having been partially completed last season. It will be continued this year.

Further Work Promised.

"This work," Mr. Sloan went on, "both in regard to the geology of the section, the extent and quality of the iron ore available, and as to the feasibility of arranging transportation facilities, will be proceeded with this year as soon as conditions permit. The assurance of the Geological Survey has been received that although hampered by a shortage of properly qualified geologists, every effort will be made to assign a party for exploration in this section during the Summer months.

"It is scarcely necessary," he said, "for me to emphasize the importance of such a deposit of accessible Hematite and Limonite ore to British Columbia. If all is as represented it means that the establishment of blast furnaces in this Province, is as practical as it has been found in any other industrial centre of the American continent. In short it simplifies the problem of the treatment of the Magnetite Ores of the Coast

and brings the establishment on a firm and lasting basis of an iron and steel industry within easy reach of those with capital looking for a sound investment that will assist at the same time in the opening up and the development of the country.

Progress Has Resulted From Government's Action.

"Broadly speaking," the Minister concluded, "we are, unquestionably, some distance further ahead towards the solution of the problem of the development of the iron ore resources of the Province. The Government has not lost sight of the importance of the question and is using every means possible to bring about the result so fervently desired. With our policy of obtaining more information regarding the deposits at our disposal, of bonuses, of assisting those undertaking experiments in treatment, and lastly of obtaining from the Legislature the power to prevent the tying up of such holdings for speculative purposes, we may expect action soon."

BOOK REVIEW.

TECHNICAL WRITING. By T. A. Rickard, Editor of "Mining and Scientific Press." First edition. John Wiley & Sons, New York and Chapman & Hall, London. 178 pages with index. Buckram and Boards. \$1.50 net.

Those who have read Mr. Rickard's previous work, "A Guide to Technical Writing," will need no introduction to his abilities to point out the frequent faults of technical writing, a subject which, as the editor of a technical publication, must be constantly before him. "This little book" states Mr. Rickard in his preface, "has grown from a set of five lectures delivered before the engineering classes of the University of California in 1916. It is a ticklish task to write on writing, because the effort provokes self-consciousness. All I hope to accomplish by means of these printed lectures is to cause members of my former profession to 'sit up and take notice.'" We believe Mr. Rickard can claim to be master of two professions.

As a writer, Mr. Rickard is well qualified to advise on style, having himself developed one of the most lucid and readable styles in contemporary technical literature. A mode of expression such as that employed by Mr. Rickard is not, however one that can be easily come by, and it will be admitted by those who have any experience of writing that what is apparently the happy and spontaneous expression of the moment is in reality the outcome of much reading, much experience, much labor, and a thorough knowledge of the subject written about. Those who have had occasion to look over the papers of students and immature writers will have noticed that half assimilated and incomplete knowledge leads to a turgidity that no amount of use of technical terms will help to clear, and, conversely, the speeches of eminent scientists, who thoroughly comprehend their subject, are remarkable for their simplicity of wording and the clearness with which the ideas they discuss are presented to the reader.

One of Mr. Rickard's happiest essays dealt with the romance of mining, and was doubtless much appreciated by the International Mining Convention before which it was delivered recently at Seattle, but this essay could not have been undertaken without wide knowledge, and revealed an acquaintance with litera-

Electric Steel & Engineering, Ltd.

HEAD OFFICE:

WELLAND, - ONTARIO

MINING MACHINERY

ELECTRIC STEEL CASTINGS

HYDRAULIC MACHINERY

WORKS:

THE ELECTRIC STEEL & METALS CO., Limited - - WELLAND, ONT.

BOVING HYDRAULIC & ENGINEERING CO., Ltd. - LINDSAY, ONT.

THE WABI IRON WORKS, Limited - - - NEW LISKEARD, ONT.

ELECTRIC STEEL & ENGINEERING, LTD.

WELLAND - ONTARIO

ture, old and new, sacred and profane, that is attained by few technical writers. While, therefore, the attainment of Mr. Rickard's own felicity of expression is only possible to those, who in addition to the ability to think clearly and the possession of accurate technical knowledge, are deeply read and possess more than an ordinary education in English, there is a widespread necessity existing among engineering students to improve their use of English as an instrument to convey technical knowledge to others.

Mr. Rickard's slogan is "Remember the reader," which he correctly terms the fundamental rule of writing. "Somebody must put hard work into every technical article that is written for publication, if not the author, then the editor; if both the author and the editor shirk their duty, the reader will have a headache."

A quotation from Quintillian by Hill is used by Mr. Rickard, to emphasise the necessity for clearness, that is very apt. "It is not enough to use language that must be understood."

"Superlatives and other Diluents," is a chapter touching a common fault of writers. "Diluent" is a delicious sarcasm. The word "very" it is stated can be deleted nine times out of ten. The qualification of the unqualifiable word "unique" is properly condemned. "Considerable" is described as "a woolly word, usually out of place in a technical statement." Such loose and indefinite terms as "more or less," "some," "greater or less extent," "more or less completely" are shown to be a source of weakness. "The secret of a vigorous style is the rejection of the superfluous word" is Mr. Rickard's conclusion. At the same time he shows that clearness is desirable even if it requires seeming tautology.

A helpful chapter is that on hyphens and compound words, the trend of which is to be seen from the following examples :

"A 'single stamp-mill' is a lonesome mill.

"A 'single-stamp mill' is a mill consisting of batteries of one stamp each.

"A 'single-stamp-mill' is a mill containing only one stamp.

"A 'crude ore-bin' is an ore-bin of crude construction.

"A 'crude-ore bin' is a bin made to contain crude ore.

"A 'crude ore bin' is an example of crude writing."

In the chapter of "slovenliness" Mr. Rickard criticises, not too hotly, the befouling of the English language with vulgarisms and colloquialisms that are understood only locally or regionally. "Chucking muck in the gob" may be a phrase understood in Yorkshire coal-mines, but it is not preferable to "packing the waste," a term that does permit of ambiguity.

"Jargon" is dealt with entertainingly but in a root and branch fashion. It is described as dealing in periphrases rather than going straight to the point, it loves the abstract rather than the concrete, it dabbles in words of sound rather than meaning." Sir Arthur Quiller-Couch is quoted as writing; "In literature as in life he makes himself felt who not only calls a spade a spade, but has the pluck to double spades and re-double."

We think Mr. Rickard's truest statement is that slovenly writing is the result of slovenly thinking, "for slovenly habits of expression corrode the very substance of thought." A notable quotation is given from Whewell, who in the "Philosophy of the Inductive Sciences" writes: "Language is often called an instrument of thought, but it is also the nutriment of thought; or rather it is the atmosphere in which thought lives; a medium essential to the activity of speculative powers, although invisible and imperceptible in its operation, and an element modifying, by its qualities and changes, the growth and complexion of the faculties which it feeds."

Mr. Rickard's little book is commended to all who desire that their writing shall clearly express the thoughts they desire to communicate. While not all can hope to attain to the ideal of language expressed by Mr. Rickard in the concluding sentence of his book, is here quoted as a fine example both of style and idealism. "Language is a factor in the evolution of the race and an instrument that work for ethical progress—it is a gift to be cherished as the ladder by which man has climbed from his bestial origin and by which he may ascend to a loftier destiny, in which, ceasing to stammer in accents that are but the halting expression of swift thought, he shall unfold his mind in the fulness of speech, and, neither withholding what he wants to say nor saying what he wants to withhold, shall be linked to his fellows by a perfect communion of ideas."

F.W.G.

STEEL TANKS

HEAVY & LIGHT
STEEL PLATE CONSTRUCTION ERECTED ANYWHERE

THE TORONTO IRON WORKS

LIMITED

HEAD OFFICE:
ROYAL BANK BLDG. TORONTO

WORKS:
CHERRY STREET

