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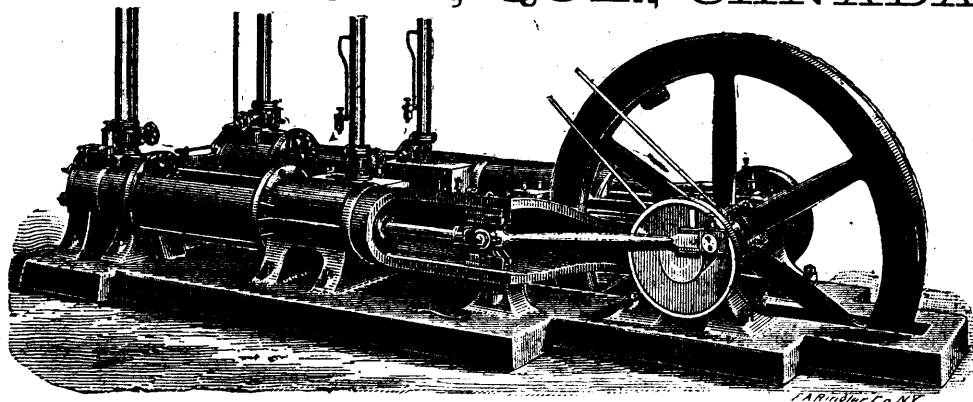
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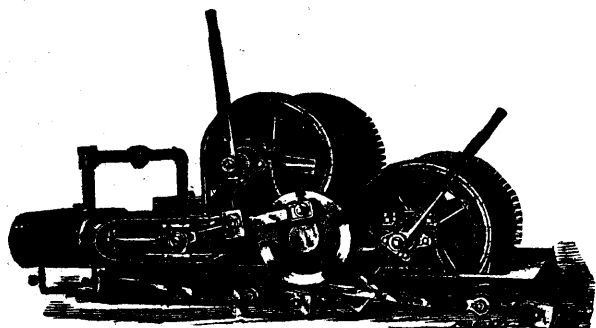
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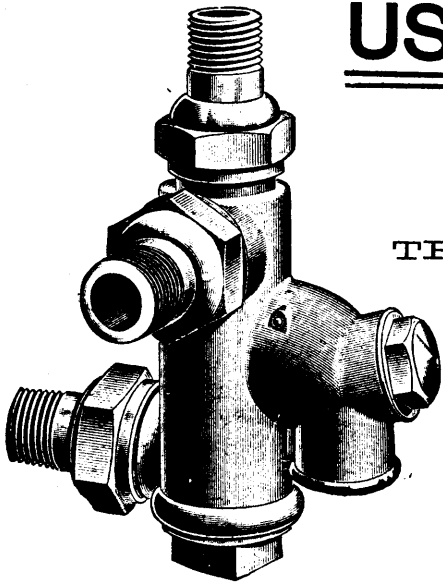
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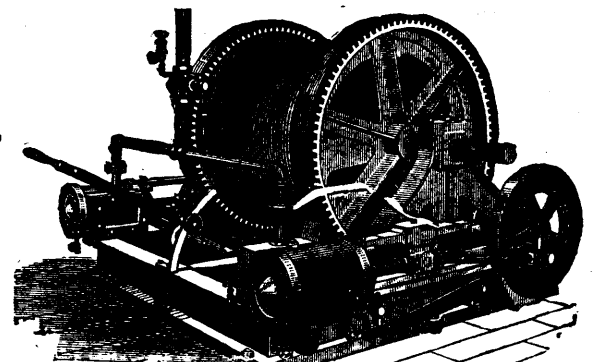
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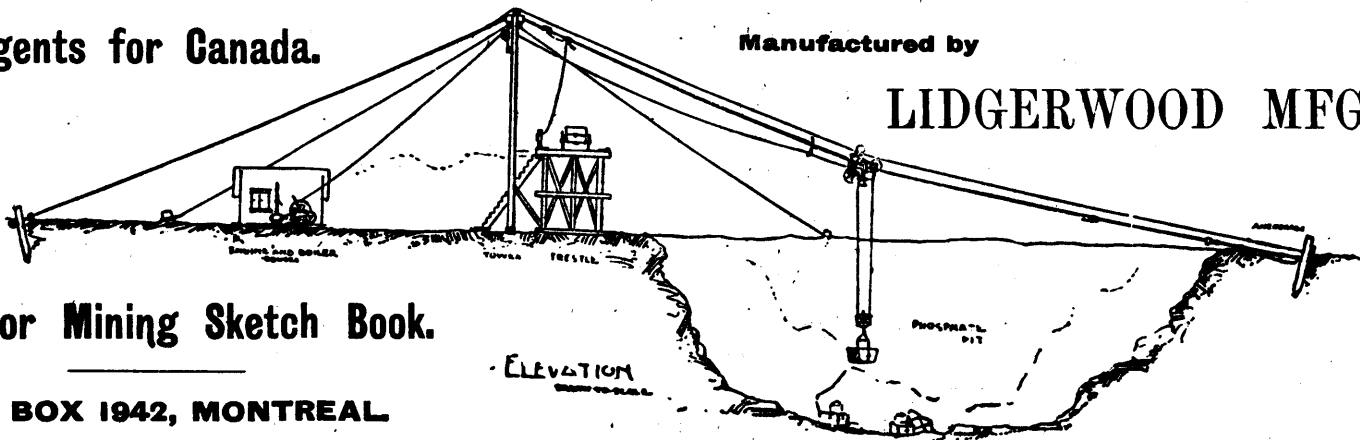
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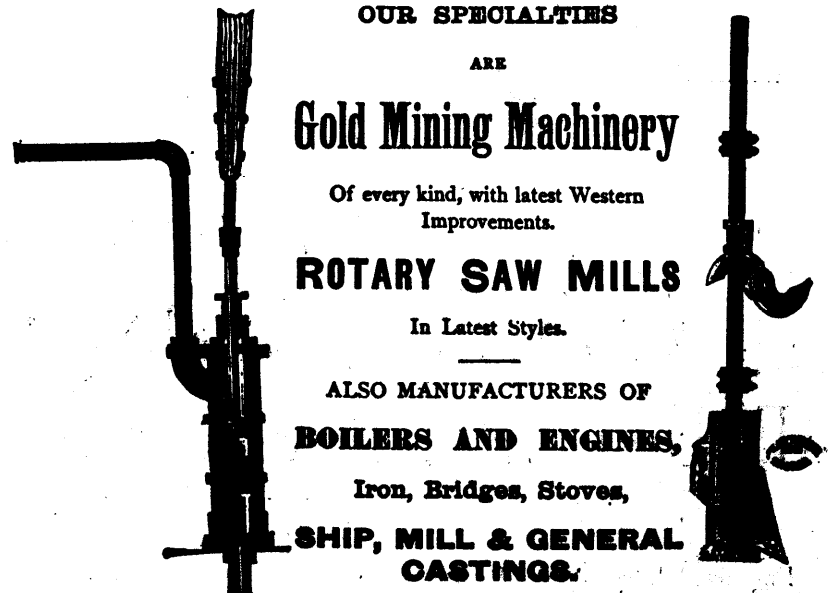
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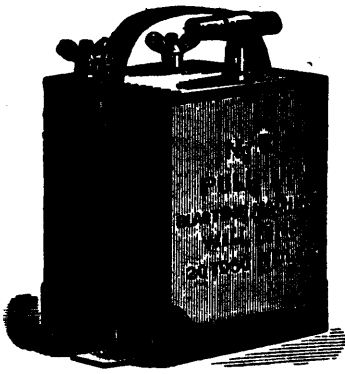
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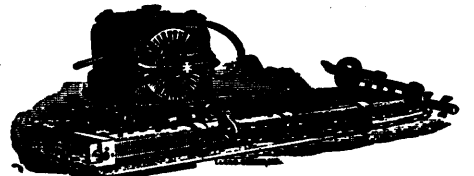
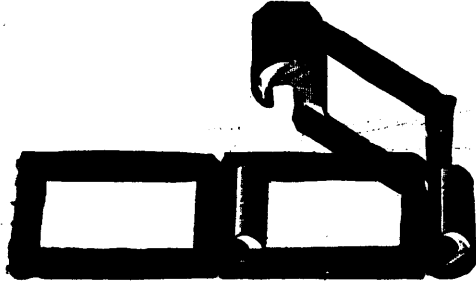
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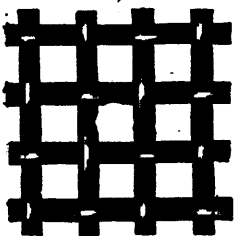
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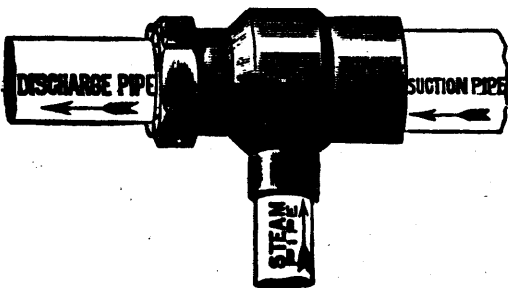
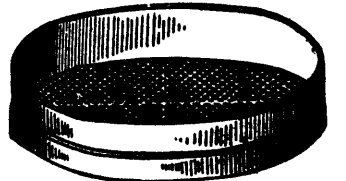
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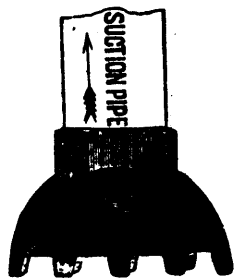
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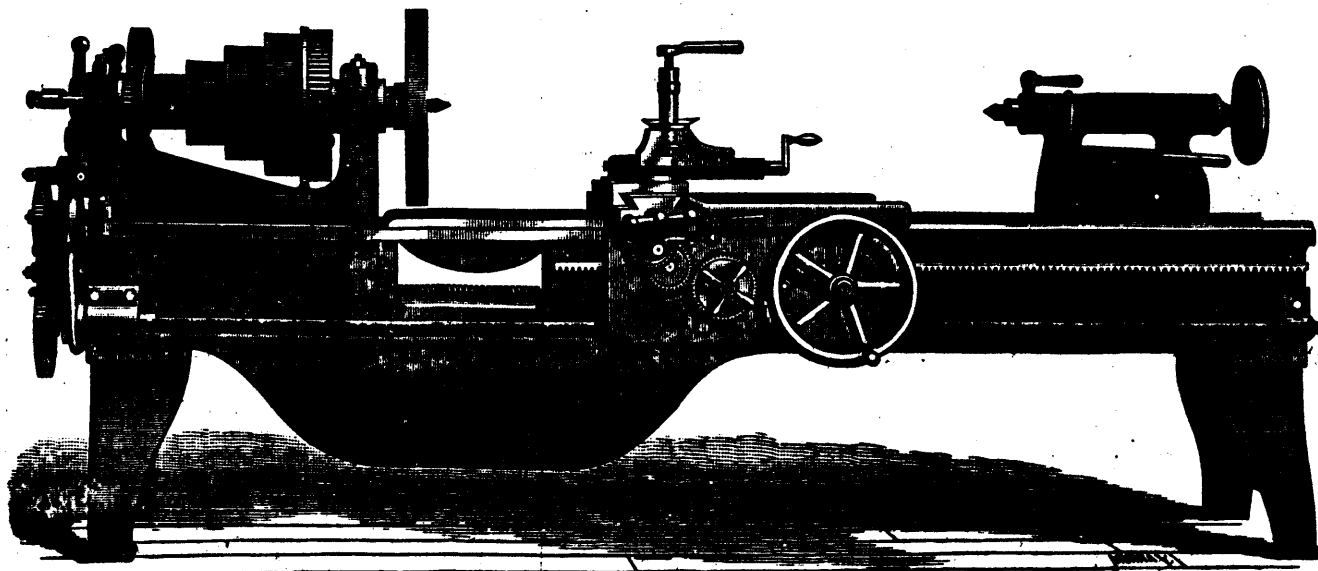
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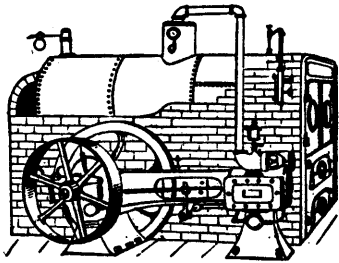
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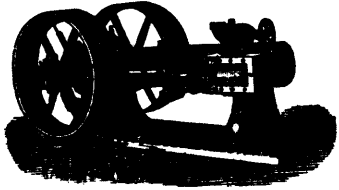
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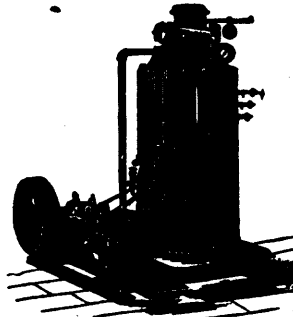
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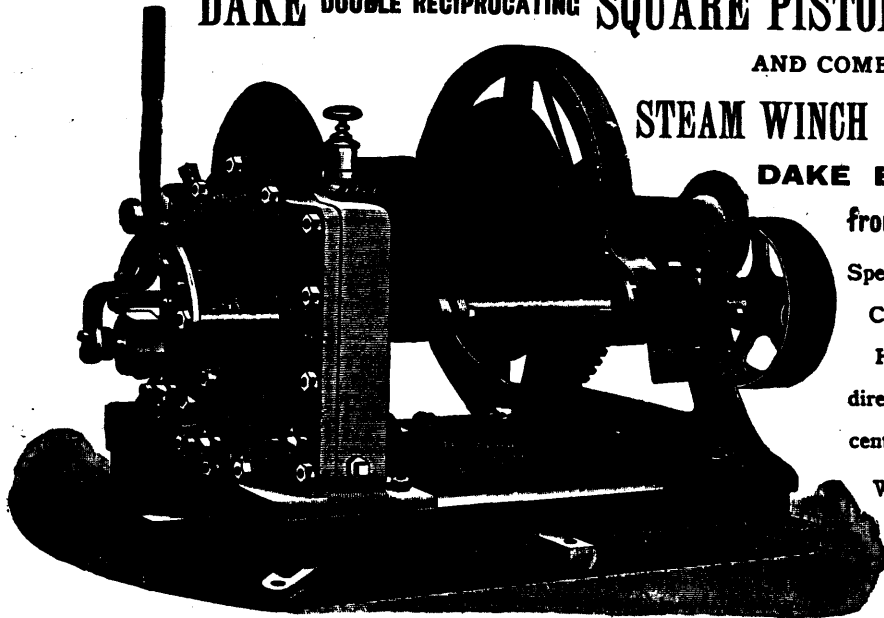
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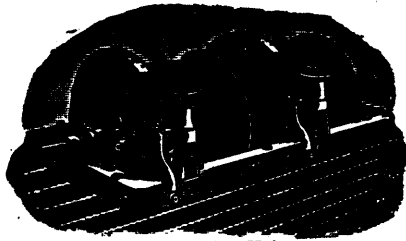
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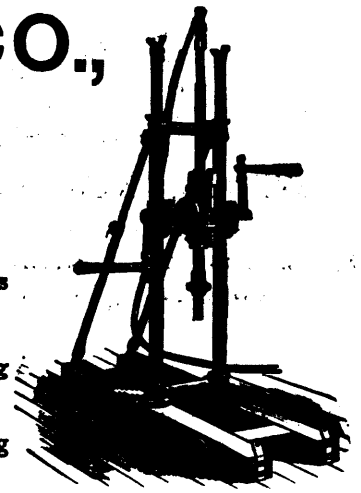
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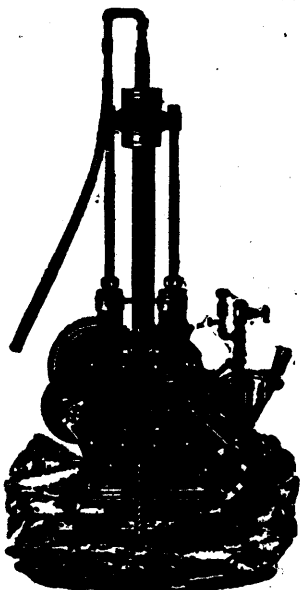
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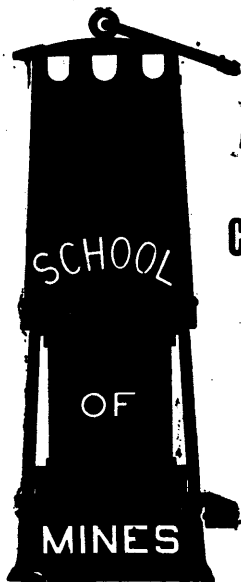
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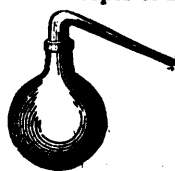
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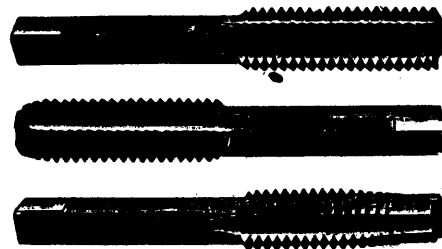
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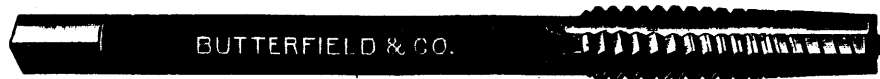
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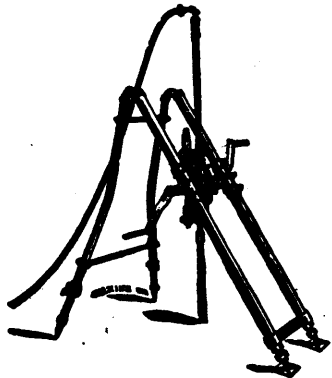
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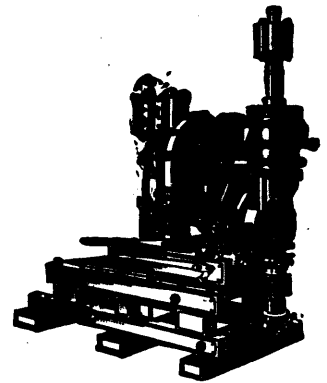
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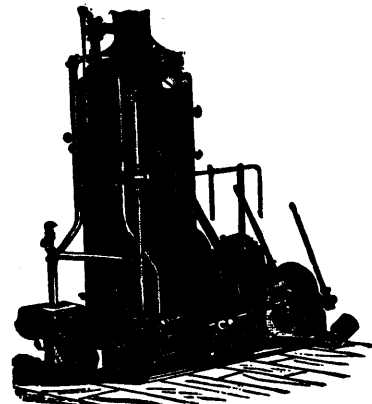
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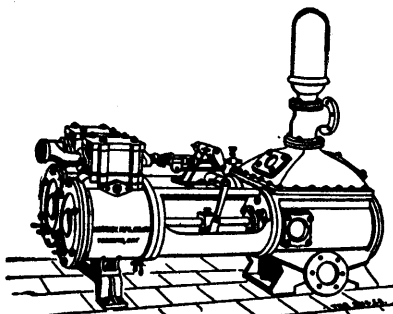
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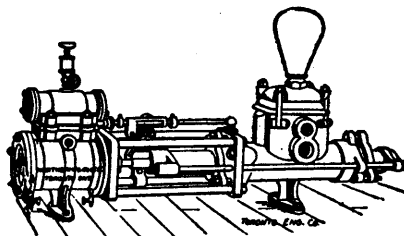
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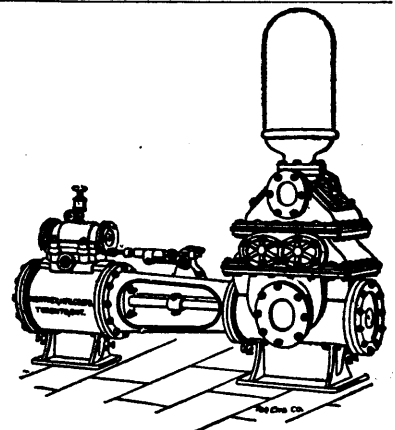
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THE following Resolutions of Council indicate beyond a peradventure the status of THE REVIEW at the exponent of the Canadian Mineral Industries:—

The Gold Miners' Association of Nova Scotia.

"At the annual meeting of the Gold Miners' Association of Nova Scotia, held at Halifax on 21st March, 1892, THE CANADIAN MINING REVIEW is had adopted the official organ of this Association.  
 (Signed), H. C. WILSON, President,  
 G. J. PARTINGTON, Secretary.

The Mining Society of Nova Scotia.

"Moved by Mr. R. G. Leckie, seconded by Mr. C. A. Dimock: That the thanks of the Society be tendered to Mr. B. T. A. Bell for his kind offer placing the columns of THE REVIEW at the disposal of the Society, and that THE CANADIAN MINING REVIEW is hereby appointed the official organ of the Society."  
 (Signed), H. S. P. GALT, President,  
 H. M. WYDIE, Secretary.

The Asbestos Club, (Quebec.)

"Resolved: That THE CANADIAN MINING REVIEW is, by authority of the Members and Council, hereby appointed the official organ of the Asbestos Club."  
 (Signed), D. A. BROWN, President,  
 A. M. EVANS, Secretary.

The General Mining Association of the Province of Quebec.

At a meeting of Council held at Montreal on Friday, 6th May, 1891, it was moved by Captain Adams, seconded by Mr. R. T. Hopper, and resolved: That THE CANADIAN MINING REVIEW be the official organ of the Association.  
 (Signed), GEORGE IRVING, President,  
 H. T. A. BELL, Secretary."

## OFFICES:

Victoria Chambers, 140 Wellington Street,  
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Vol. XI. OCTOBER, 1892. No. 10.

### The Sydney and Louisburg Coal and Railway Company—A Word for the Shareholders.

While the list of our dividend-paying mines, asbestos, gold, coal, nickel, mica, silver, copper, and other minerals, gives abundant evidence that Canada is an excellent field for the profitable investment of capital, we occasionally have a statement that "the country is no good," dinged in our ears by English capitalists who have been soured and disappointed by ventures in profitless enterprises. Bitten once they look charily at the prospectus of any new undertaking, no matter how good, that may be promoted from this side. Yet the reason too frequently, is not far to seek. Extravagance, incapacity, ignorance, fraud, unscrupulous company promoting, particularly in London, mismanagement of various kinds, have unfortunately played their part too prominently in the history of mining by English operators in Canada. Indeed one does not wonder if the unsuspecting shareholder, trusting implicitly in his titled board of guinea pigs, and mayhap misled by the specious impositions of some incompetent or dishonest manager, should thoughtlessly seek to shoulder the blame upon and thus discredit the resources of a country about which he may, and usually does, know next to nothing.

Following up our exposé of the quakeries and frauds of Englishmen of the calibre of Dobson and Ahn, and notable failures of English corporations like the Scottish-Canadian Asbestos Co., (Ltd.), White's Asbestos, (Ltd.), and in more recent times, the General Phosphate Corporation, (Ltd.), we are compelled this month to make a disclaimer against placing to the credit of Canada, its people, and its resources, the unfortunate state of affairs presented in the last published Report of the Sydney and Louisburg Coal and Railway Company, an English organization operating in Cape Breton.

In another place a correspondent calls attention to some curious anomalies in this document worthy of attention. He points out that notwithstanding a largely increased output of coal, exceeding 170,000 tons, sold at remunerative prices, unhampered by accidents or strikes, the net profits of the company on the year's operations, or rather its available earnings not diminished by interest bonds or mortgages, amounting to the paltry sum of £1,120 stg., and having at heart the good name of the resources of the country he bluntly demands an explanation. We, too, have been curious, and as the result of a close investigation we are prompted to make the following remarks: The company was registered in 1880, to take over the property of the Cape Breton Company (Ltd). It owns and operates an area of coal lands extending over sixteen square miles, on the Island of Cape Breton, upon which are situated its Schooner Pond, Lorway and Emery collieries. The quality of its coal is excellent. Last year prices were better than they had been for many years, and for the first time in its history the company's output, amounting to 170,863 tons, surpassed the production of any of the other Cape Breton mines. Shipments were mainly to St. Lawrence ports, sales in the Province of Quebec alone reaching 92,285 tons round, and 16,934 slack coal. The net returns realized on these sales is reported to have been considerably higher than that obtained by most of its competitors. But notwithstanding these most favorable circumstances, the net profits of the company (see report of directors elsewhere) only reached the meagre, disappointing figure quoted by our correspondent.

The shareholders of the company have entrusted the care of their property to the directors. Not one of these gentlemen has ever visited Cape Breton, though the company began business there in 1881, since which date fully \$30,000 must have been paid by the shareholders in directors' fees. Had the chairman known more of Sydney, it would have been impossible for him to stand up in London and say that an "impact with ice" in April, 1891, injured the company's pier, necessitating repairs at a cost of £1,328. No such damage, as far as we can learn, occurred within the knowledge of any reputable resident of Cape Breton, and no repairs of such cost were made.

So much for what the chairman would not have said. On the other hand, had he been properly in touch with the property whose de-

velopment he presides over, or did he and his co-directors follow the example of their neighbours, the General Mining Association, a company similarly situated in every respect, in sending out a trusted representative each year to look into matters on this side, he would have been able to tell the shareholders, while explaining to them the necessity of paying a £600 instalment on the purchase of their new coal area, that this same area was sold to the company through a third party by three of its servants, who realized £3,000 for what had only cost them a short time before, the amount of fees payable to the Mines Department in Halifax. And while on this subject it might also have interested the shareholders to learn that these same three servants have plastered the surrounding country with "licenses to search," in the hope, it is to be presumed, of making yet another such a lucky scoop.

Had the chairman, knowing this, failed to fully explain the transaction to the shareholders, he would have failed in his duty to them, inasmuch as the sale of areas for a large sum to the company by a syndicate composed of its mine manager, its accountant, and its head engineer, could only be justified by special circumstances and certainly not without proof, based on an expert's examination and report, that the company was getting good value for its money.

Again, had the chairman been adequately posted as to what was being done across the ocean, he would or should have told the shareholders of the erection of large buildings and warehouses on the company's property adjoining their pier, and explained how these same buildings with adjacent wharves and premises, also belonging to the company, came into the possession of "J. Webb & Co."

There probably would be nothing in such intelligence to excite suspicion, unless the chairman proceeded to state that this firm of "J. Webb & Co." is generally regarded to be a myth, as can be learnt from any Mercantile Agency, and that the name is simply used as a cloak by the company's agent and manager, who, under it, carries on a large wholesale and retail business, numbering among his customers the company whose interest he is paid to protect.

These questions having been disposed of, it would be in order for a suspicious or dissatisfied shareholder to enquire why the toll levied on the proprietor of the mines store for stopping in the office on orders, moneys due to the store by the company's workmen, is not paid into the company's coffers, seeing that the work in connection therewith is performed altogether by the company's servants, and why the manager is permitted to pocket from this source a large annual income (sufficient last year, had it gone to the company, to have increased the divisible profits by more than one-third), paying only a small, if any, proportion to the company.

By this time the disgruntled shareholder would feel inclined to ask the chairman how much was spent in 1891 upon the manager's house, of which mention was made and a photograph exhibited at the previous annual meeting,

and why the directors thought fit to spend on a palatial residence, which overtops in magnificence anything ever attempted by the most optimistic company in Nova Scotia even during the old regime of princely extravagance, an amount that would have almost sufficed to pay off a year's arrears of interest on the preference shares.

But so long as things remain as at present, the chairman is not likely to volunteer any such information at shareholders' meetings, and the latter, being told and believing that their interests are faithfully and economically looked after, will curse the country they have invested their money in, instead of laying the blame upon the proper shoulders.

### EN PASSANT.

It is now a certainty that the proposed International Mining Convention will take place. Among others who have accepted an invitation to be present and take part in the proceedings may be mentioned the American Institute of Mining Engineers, the Mining Society of Nova Scotia, the General Mining Association of Quebec, the Asbestos Club, and the Provincial Mining Association of Ontario. The proceedings, which will occupy the greater portion of the third week in February next, will take place in buildings of McGill University, Montreal. The subjects to be discussed will be divided into the following heads: (1) Mining Legislation, having particular reference to the laws of the various provinces of Canada; (2) Our Mineral Resources and Mining Industries; and (3) Canadian Mining Practice. The Convention will be held under the auspices of the General Mining Association of the Province of Quebec, by whom it is understood a liberal programme for the reception and entertainment of visitors is being prepared.

This will be the fourth occasion on which the American Institute has held meetings in Canada, sessions having been held in Montreal, at Halifax, and in Ottawa in 1889.

Just as we go to press we are in receipt of the First Annual Report of the Bureau of Mines for the Province of Ontario. Mr. Archibald Blue, the Director, has done his work thoroughly, with the result that an immense amount of useful information respecting the minerals and mining development of the Province is given to the public. The Report covers nearly three hundred pages, closely printed, neatly gotten up, and well indexed for reference. Among other features of interest may be noticed a review of the operations of the Ontario Mining Act, to which is appended interesting extracts from the report of the British Commission on Mining Royalties, a sketch of the artesian wells in the Province, a paper by Dr. Robert Bell on the Laurentian and Huronian systems north of Lake Huron, in which is incorporated much useful data respecting the mineral wealth of that portion of this country, a review of the production of structural materials, an extended notice of the

resources of Ontario in natural gas and oil, a well timed and exhaustive article on the subject of "Peat, its use and value for fuel," the whole concluding with the report of Mr. Slaght, the Inspector of Mines, in which he gives his observations on the progress made in the different mining camps during the year 1891. The report is a valuable acquisition to the mining literature of the country.

At the last spring meeting of the Iron and Steel Institute, Mr. Arthur Wingham read a paper descriptive of a new slide-rule. The calculations necessary for the preparation and control of furnace charges and material are often long and tedious, and, moreover, frequently require a ready knowledge of chemical formulae or equations and atomic weights. It is well understood and recognised in works that any means which will shorten the time and trouble bestowed upon such calculations should be encouraged and valued as so much gained. The present slide-rule has been constructed for the purpose of giving immediate, and, at the same time, accurate results. It can be applied to and utilized in various manufactories, but it will probably be found to be most useful in iron and steel works. The principle on which the slide-rule is constructed is that of having a scale for each base, basic material and acid, so divided that any given length or quantity of one will show in the same length of the other the quantity of material which will be necessary either to displace or combine with it, as the case may be. These scales are placed side by side in such a position on the rule that the rectangular end of the slide above them measures the amounts of each material, which chemically correspond one to the other. The practical use of the scales is further enhanced by the peculiar construction of the rule. It consists of a framework or body about 12 inches long,  $1\frac{3}{4}$  inches wide, and  $\frac{1}{2}$  inch deep, into a broad shallow cutting near the surface of which slides to within an inch of end a long rectangular slip of wood, which may be designated the main slide. In the body underneath this main slide are four narrow slides, which are moved by prominences which reach beyond the surface of the main slide at one end. These under-slides can only be moved when the main slide is out, and the closing of the latter shuts up all the former. On each of these four under-slides is marked one of the following basic scales: Magnesia, alumina, soda and ferrous oxide (manganous oxide is practically the same as ferrous oxide). The lime scale is marked upon the lower surface of the body, close to the silica scale. Among the chief recommendations of the rule is the fact that it contains a large amount of information in a very small space, and in a form by which are given results sufficiently accurate for practical purposes. These results can be obtained in a very short space of time, without the probability of that inaccuracy which is so often attendant upon rapidly made calculations. The manufacture of the slide-rule has been entrusted to Messrs. John Davis and Son, of Derby, England.

It is stated that Mr. E. M. Smith, of New Zealand, has been conducting some further experiments regarding his process for smelting ironsand, in the course of which a blast furnace at Onehunga was charged with the ironsand in the shape of bricks instead of with iron ore. A tapping took place, and the result was that several tons of iron were obtained from the surface. The metal was pronounced by experts to be workable iron of first-class quality, far superior in fact to that hitherto produced from any of the New Zealand ores. A portion of the molten metal was converted into small castings, amongst which was a barrow wheel, and it stood this test in a highly satisfactory manner. The "bricks" with which the furnace was charged consist of an admixture of ironsand and clay, and were brought by Mr. Smith from New Plymouth, where it was manufactured fifteen or sixteen years ago. A further quantity, made of similar materials, has just been brought to Onehunga from the Avondale Brick Works, and is now being used to feed the furnace. Mr. Smith claims that the yield of iron is equal to 50 per cent. of the weight of the bricks, and he is sanguine of being able to produce iron of a high class at a payable rate. Coke from the grey coal was used in the trials, and there being at the time a scarcity of limestone at the works, shells were used in its stead. Two truckloads of Kamo limestone have, however, recently come to hand, and will be used in future operations. The trials have been watched with great interest by the Onehunga people, to whom the development of the industry is of much importance, as it is said the west coast abounds with inexhaustible quantities of raw material in the shape of the deposits of ironsand.

An important trial of ammonite, the new explosive, took place at Newport, Monmouthshire, lately, in blowing down a heavy stone wall of 920 cubic yards capacity dividing the Alexandria Dock from an extension dock which had just been completed. Water had been let into the new dock from the River Usk, and a level made with the water in the older dock. In order to remove the wall dividing the two, it was decided to try the explosive force of ammonite fused by electricity. Charges of 100 pounds of the compound were placed in 43 drilled holes, and a dynamo at 110 volts was connected with the charges. Lord Tredegar, as chairman of the dock company, moved the electric switch, and the explosion that followed was considered highly satisfactory. It was not intended to demolish the wall entirely, but to so split and crack it that the masonry could be easily dislodged and removed. That result was practically attained, the wall being loosened all through from top to bottom without any damage being done to the surrounding works at the dock. Ammonite is one of the Sprengel class of explosives. It consists of ammonium, nitrate, and nitro naphthalene, mixed together in an edge runner mill at a certain temperature, and afterwards filled into metallic cases. One of its chief advantages is that for many purposes it is

perfectly harmless, and cannot be fired by ordinary concussion, or even by throwing it into an open fire. Its explosive properties are only brought out with the aid of a detonator containing fulminate of mercury.

Among the many yarns that crop up in the mining literature of our friends across the border, the following, clipped from a western contemporary, may be taken with the proverbial grain of salt: A trick was successfully played upon a party of San Francisco men in 1861 by some Silver City miners who were prospecting a vein of gold-bearing quartz. The vein was very "spotted," and the pockets, when found, were small. The miners had a shaft down about 25 feet on their vein, and having reached a rich pocket that covered the whole bottom, were anxious to sell, as they might sink 50 feet further without finding another spot as rich. In Virginia City they found three men of money from San Francisco who wished to invest in a mine, and who were well pleased with the samples of ore shown them. The San Franciscans agreed to go to Silver City in a few days and examine the mine, when, if they found all satisfactory, they would pay the price asked—\$20,000. With the San Francisco trio was a fourth man who was impecunious, but not contentedly so. This man "approached" the miners on the sly, and saying he had great influence, offered to talk the San Francisco men into buying the mine, provided he were given a share of the spoils. It was agreed that he should have \$500 if the sale were made. Then it was arranged that on a certain day the Silver City men would not go near their mine, that they should be at work at another place a mile away. On that day their confederate was to take his friends, the San Francisco capitalists, to the mine on the sly and assist them in prospecting the bottom of the shaft in the most thorough manner; he telling them he had ascertained that the owners would be at work on another claim for a day or two. The three San Franciscans bit at once. They thought it would be a clever trick to steal a march on the "honest miners." They dug into all parts of the bottom of the shaft and obtained wonderful prospects. Free gold was visible in almost every piece of quartz they dug out. In short, they readily paid the \$20,000 asked for the mine and set to work in the shaft expecting to get their money back in less than a month. They had not got down over two feet, however, before they were in barren quartz. They did much work, but never found anything except a few insignificant pockets. The worst of it was that they dare not complain of their bad luck, for as soon as they had secured the mine they had boasted to many friends of the cunning way in which they had prospected the bottom of the shaft. It was long before they heard the last of their mining venture. When they talked of there being a big thing in a mine their friends would ask them if they had been prospecting it "on the sly." The \$500 which their honest friend had received changed his luck; he remained in the country and presently secured a fat State office.

**Notes from Laboratory on Some Iron Ores from Nova Scotia.\***

WM. SMAILL, LONDONDERRY, N.S.

Glancing at a map upon which the occurrence of different minerals of this Province are marked, one will notice that the main deposits of iron ores seem to be confined to a band about twenty miles wide inland from the Bay of Fundy, starting in at Digby and continuing in a north-easterly direction to Colchester County; here taking a more easterly course through Colchester, Pictou, and Antigonish Counties, when it again resumes its northerly course through the central parts of Cape Breton, and are found in rocks of the Triassic, Carboniferous, Devonian, Silurian, and Laurentian.

Naturally, the different chemical and mechanical processes—giving rise, first, to the formation; secondly, the concentration of these ores into economic deposits—which have been going on through these ages forming beds and veins of ore, have taken place at different periods of time, and under many varied conditions, thus yielding different results both chemically and physically.

Iron ores may be classed as follows:—

- I. OXIDES .....
  - Anhydrous ..... { Magnetite.  
Hematite.  
Titanite.
  - Hydrous ..... { Limonite.  
Bog Ore.  
Turgite.
- II. CARBONATES { Siderite; Ankerite; Clay Iron-Stone; Black Band.

**Magnetites.**

The most important deposits are found in the Triassic, Devonian, and Laurentian, of Annapolis County and Cape Breton. These deposits are now looked upon as being of sedimentary origin, and not eruptive. They may have been formed in the same manner as bog ores, the accumulation of iron sands, or the metamorphism of pre-existing ores. This latter fact is well illustrated in the manufacture of so-called metallic paint from bog ores, ochres, &c. These contain organic matter, which, in the subsequent calcination, reduces a certain portion of the ferric oxide to ferrous state, the result being a magnetic oxide of iron. The magnetites of Annapolis County are best known, being the first ores to be smelted in the Province. At Clementsport a furnace was erected in 1831 to smelt the ore occurring in the Devonian of that vicinity. Two principal beds were worked, the ore yielding from 30 to 50 per cent. of iron.

At Nictaux two varieties of magnetite are found: one fossiliferous and partly magnetic, the other a dense compact variety. From many analyses I find that these ores run

Iron	.....	From 40.00% to 65.00%
Silica	.....	" 9.00% to 15.00%
Sulphur	.....	" 0.40% to 0.80%
Phosphorus	.....	" 2.00% to 5.50%

containing also varying amounts of lime, magnesia, and alumina.

The compact variety, which is much the better of the two, has been tried here, but owing to the kilns then in use, which did not give a thorough

\* Paper read at the September meeting of the Mining Society of Nova Scotia.

calcination, the result was an iron rather unfit for foundry purposes, and its use was promptly abandoned. Probably if the ores were well broken up and a better selection made, with the new and improved kilns now in use they would prove valuable ores for certain classes of iron.

A deposit occurs at Digby said to be of considerable size, and comparatively free from sulphur, phosphorus, or titanium, yielding from 40 to 50 per cent. of iron.

Between Economy and Five Islands, Colchester County, at Gerrish Mountain, a quantity of ore was at one time mined for this place, and according to analyses it must have been a most valuable ore.

I have had many magnetites sent to me for analyses from almost every part of Cape Breton, but have never had reliable information as regards extent or true locality of samples. I will just state that they were generally high in iron, comparatively free from phosphorus but rather high in sulphur, and would thus necessitate roasting.

**I.—MAGNETITES.**

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
FeO	23.88	21.76	70.72	.....	.....
Fe <sub>2</sub> O <sub>3</sub>	63.79	48.34	.....	.....	.....
MnO <sub>2</sub>	0.08	0.40	.....	.....	.....
SiO <sub>2</sub>	8.83	18.95	27.20	15.59	9.10
CaO	0.11	4.01	1.20	.....	.....
Al <sub>2</sub> O <sub>3</sub>	trace	1.62	trace	.....	.....
MgO	3.27	0.60	0.937	.....	.....
S	trace	0.08	.....	0.025	0.028
P <sub>2</sub> O <sub>5</sub>	none	3.08	0.128	0.017	0.020
TiO <sub>2</sub>	none	none	.....	.....	.....
Iron	63.23	50.77	51.04	62.69	62.13

No. 1 from Five Islands (Small).  
No. 2 " Nictaux "  
No. 3 " Digby "  
Nos. 4 and 5 from Milbury (Maynard Brown).

**Hematites.**

The main deposits occur in the Palæozoic, both bedded and in veins. Many varieties of ore come under this head, but the different species depending more on physical conditions than chemical composition. Hematites are generally freer from impurities than magnetites, and are much easier to reduce. They are formed by the alteration of pre-existing deposits of other ores of iron or the pseudomorphous replacement of other minerals by iron. The supply of this class of ore in Annapolis County is said to be inexhaustible. Like the magnetites of this county we find two varieties present: a highly fossiliferous hematite known as "shell ore," rich in iron but too high in phosphorus to be used for manufacture of foundry iron; 2nd, a compact variety occurring at Torbrook, discovered about two years ago, and now equipped with all the most modern appliances, &c., for the mining and handling of the ore. These mines are now turning out something over a hundred tons per day, and the ores used in connection with limonites and spathic ores in works here, yielding a very superior soft foundry iron, much prized by the foundry-man owing to the large amount of scrap it will carry in the cupola. A full description of these mines is given in the paper by Mr. R. G. E. Leckie, manager of the mines. The ore is a compact red hematite, somewhat silicious, with a perfectly tabular cleavage.

At East and West Mines of this place,



hematites occur in many varied forms. A hard compact variety of specular ore, commonly called by the miners "black ore," is found in veins of all sizes traversing the ankerite, or as micaceous ore in pockets, scattered through the soft ochrey ores; the occurrence is well illustrated in the level at Cook's Brook, where the original carbonates are all decomposed into soft ochrey ores, and the specular is scattered in small stringers and pockets all through, seemingly preserving the same position as in the original ankerite. Small quantities of magnetite are also found in minute grains scattered through some parts of this deposit.

Hematites are found in many parts of Hants County, and I have had small specimens from several parts which proved very pure, although somewhat silicious, but have no certain information as regards the extent, although as usual the most positive information generally given to any question of this kind from parties sending samples is invariably, "there is any amount."

Pictou County is well supplied with specular ores and red hematite. The main deposits are at East River and Sutherland's River, where mining operations are now being carried on to supply the new blast furnace at Ferrona. Full descriptions of these deposits have been given by Messrs. Gilpin, Harrington, and others.

Among other noted localities, I may just mention St. Peters, Sydney and Whyhogomah, C.B.; the specular ores of Roman Valley, Manchester and Melrose, Guysboro' County, at Lochaber, Antigonish County, and red hematite of Grand Lake, Halifax County. The deposits of hematite occurring in veins are generally specular and micaceous ores which are almost invariably of lesser extent than the bedded and vein deposits of red hematite, and most attention should be given to the latter.

2.—HEMATITES.

	No. 1.	No. 2.	No. 3.	No. 4.
FeO	.....	.....	8.80	.....
Fe <sub>2</sub> O <sub>3</sub>	79.42	77.14	66.60	99.78
Al <sub>2</sub> O <sub>3</sub>	5.08	7.41	8.12	.....
SiO <sub>2</sub>	12.00	5.30	9.45	0.13
MnO	0.38	1.23	0.49	traces
CaO	1.99	0.49	2.59	0.02
MgO	0.35	0.37	0.49	traces
S	0.11	0.03	.....	0.11
P	0.43	0.08	.....	traces
TiO <sub>2</sub>	traces	.....	.....	.....
BaO	traces	.....	.....	.....
Vol	.....	7.80	2.85	.....
Co <sub>2</sub>	.....	.....	.....	.....
Iron	55.60	54.00	53.50	69.85

3.—HEMATITES (continued).

	No. 5.	No. 6.	No. 7.
FeO <sub>2</sub>	.....	.....	.....
Fe <sub>2</sub> O <sub>3</sub>	.....	75.80	75.67
Al <sub>2</sub> O <sub>3</sub>	.....	4.19	0.45
SiO <sub>2</sub>	.....	8.26	19.43
MnO	.....	0.65	0.52
CaO	.....	6.30	1.37
MgO	.....	.....	0.46
S	.....	0.20	0.29
P	.....	2.65	0.22
TiO <sub>2</sub>	.....	.....	traces
BaO	.....	.....	traces
Vol	.....	1.66	.....
Co <sub>2</sub>	.....	.....	1.59
Iron	.....	53.06	54.36

- No. 1 from Torbrook, N.S. Sample taken from several cars (Small).
- No. 2, Earthy Red Hematite (Turgite) West Mines (Small).
- No. 3, Earthy Red Hematite (Turgite) Old Mountain (Small).
- No. 4, Micaceous Ore, East Mines (Small).
- No. 5, Fossiliferous Hematite (Shell Ore) from Nictaux (Small).
- No. 6, East River Red Hematite (MacAdam).
- No. 7, East River Specular

Limonites.

Limonite proper occurs in true veins, and is the result of decomposition of pre-existing ores in situ. The deposits of most economic value discovered so far are those of Colchester and Pictou Counties. At Londonderry extensive mining operations have been carried on since 1849. The belt of ore has been traced from east of the East mines running west a distance of over twenty-five miles, varying from half to two miles in width. Ore occurs in rocks of the Middle or Upper Silurian. The veins are very irregular both as regards size and contents. As regards the origin and formation of these deposits, Sir William Dawson gives the following solution.—

1. Formation of fissure;
2. Igneous formation of a deposit of iron, lime and magnesia carbonates;
3. Breaking up these by faults and cross fractures;
4. Partial roasting of contents;
5. Action of heated waters;
6. Action of the air and atmosphere.

The original deposits being altered under different conditions as regards time and agencies, the result being that we find almost all varieties of carbonates, hydrous and anhydrous oxides of iron present. Also the original vein stone in all stages of metamorphism. In the mining of these ores boulders of ankerite are met with, which almost invariably will be covered at sides and back with quantities of specular ore or limonite. The limonite often occurs in large hollow masses of irregular shape, which, when broken, contain water, and the inside surface presenting mammillated, stalactitic or botryoidal structures. Sometimes brecciated masses of the country rock are found in the interior cemented together by the ore. Large concretionary balls of ore are also found which when broken in half show white ore in the interior and different zones of oxidation and even dehydration. In these lumps, just outside the ankerite, will be noticed a small quantity of ochre, then a thin ridge of compact limonite, or perhaps a whole series of concretionary bands of limonite surrounding one another, and between each layer small quantities of soft ochre, in some cases the whole mass covered with a layer of hard black ore. Large quantities of an ochre to a compact red hematite are mined which are newer than the limonites, being formed from a more recent decomposition of the ankerite. This mineral is really turgite, being a red hematite and invariably containing combined water. It is one of the most easily reduced ores and generally very pure, running as high as 58% metallic iron, any foreign matter generally being in the shape of lime or magnesia, which of course are not deleterous elements. Some 15 years ago, when experiments were being carried on at the Newton works of the Steel Company of Scotland with the Danks rotary furnace, the lump ore used in the experiments was brought to Scotland from these mines. New levels have been opened lately; the ore mined and indications are very favourable indeed for future workings.

The limonites of Pictou County have been treated in full by several writers, much more competent to talk about them than myself. The ores of what is known as the East River district, are now being mined in large quantities for the coke furnace at Ferrona and charcoal furnace at Bridgeville. The principal deposits occur along the contact of Silurian and Carboniferous rocks. Ore is generally associated with calcite and small crystals of baryte. Some of the deposits contain notable quantities of manganese. Lumps have been received here at different times to be used as fettling in the mill. The iron contents averaged 50 to 55 per cent of iron.

Large quantities are also found near Brookfield resembling West Mines ore very much, some of which has been used here at mill and furnace working very satisfactorily. The average of 15 cars was 45.15% metallic iron. A variety of a dark brown calcareous limonite occurs at Pugwash, some having been mined and tried here, but owing to the high manganese contents it is found to produce too hard an iron for foundry use.

I have had samples sent me lately from near Grand Lake, Halifax County, which the owner of the mine claims is a true vein deposit of limonite, but appearance, &c., of the ore incline me very strongly to think it simply a dip of bog ore.

Limonite occurs in many other localities of the Province, but only those of Colchester and Pictou Counties have received anything like the degree of attention they deserve.

Bog Ores.

These ores are of modern age, found in many places in Nova Scotia, and elsewhere, on the sites of old swamps at or near the surface, and generally in sandy regions.

They have been formed in many ways thus: Waters containing carbonic oxide permeating the older rocks containing ferruginous matter would dissolve some of the iron, find their way to low swampy regions where the water charged with organic matter and organic acids would combine with the iron. In course of time the water would become impregnated with these salts of iron, which would become oxidized at the surface of the water, forming a thin film, which gradually thickening as the process of oxidation went on until it sank, when another film would start forming, &c.; this process continuing would eventually result in a bed of ore, consisting chiefly of peroxide of iron, in combination with water and organic matter; or, again, rain water falling upon decayed leaves or vegetable matter, would take up the organic acid formed, and running down the sides of hills, &c., passing over any strata containing iron would dissolve some of the iron, and, finding its way to low regions, there becoming concentrated, as before mentioned, beds would be formed in the same manner. These classes of ores are among the principal ores used in Sweden and Norway, also at the St. Maurice forges in Province of Quebec.

Manganese is almost always present, from mere traces up to 20%.

Sulphur generally in only very minute quantities. Phosphorus from traces to 2 or 3 per cent. Combined water and organic matter from 15 to 35 per cent. It is this class of ores which generally form magnetite. They are found scattered all over the Province, in Annapolis, Halifax, Kings, Hants, Colchester, Pictou, and Antigonish Counties, also in Cape Breton.

**Ochres.**

These are formed in the same way as bog ores, or are the result of decomposition of other ores of iron. Large quantities of these are not admissible in the blast furnace owing to the tendency to choke the furnace. They are found in almost every part of the Province, in greater or less extent. Generally called paint by miners. They are of all shades of colour from light yellowish to reddish brown and brownish black. Sometimes they are greyish when containing a large amount of ferrous oxide. When formed from the decomposition of ankerite, they generally contain micaceous specular ore, which often occurs in original ankerite. The light yellow variety is almost invariably the richer in iron, the darker variety seemingly containing more manganese.

Light Yellow.	Dark Brown.
Iron,..... 62.64%	Iron,..... 36. %
Ins..... traces	Ins..... 8.90%
Volatile,..... 10.60%	Volatile,..... 8.00%
	Manganese,.... 14.42%

These two specimens were from the same pit.

**Carbonates.**

*Siderite and Ankerite.*

Main deposits are at West and East Mines, Colchester County, and Sutherland's River, Pictou County. They are of igneous origin. Two main exposures are worked at East Mines to supply the furnace here; they are known as Slack's field and Totten Hill. Both are open quarries about half a mile apart, each being about a hundred feet long, fifty wide and eighty deep. Totten Hill contains more specular ore running through the mass than Slack's field, and is thus slightly higher in iron. These ores before being used in the blast furnace are calcined by new and improved kilns, which increases the value of the ore as regards the percentage of iron &c., 30 to 40 per cent. The value of this class of ore consists not so much in amount of iron it contains but in the valuable fluxing properties it possesses; 120 lbs. of calcined ore being equal to about 100 lbs. of limestone; cost of calcining is only about 1 cent per ton. The deposits at Sutherland's River, Pictou County, are of the same class, but have not been worked to any great extent as yet.

**Clay Ironstone.**

This is found in different parts of the carboniferous areas of the Province. The ore is a compact, argillaceous carbonate of iron, greyish to black in colour. It is said to occur more frequently in Cape Breton. This class of ore is most largely used in England and Scotland in the manufacture of their pig iron, but has not yet been found in any large quantities in Nova Scotia. The iron contents vary from 15 to 35 per cent.

**Black Band.**

This is found in all the coal measures in Nova Scotia. It is really a clay iron stone containing a large amount of organic matter. Both of these last varieties have been experimented with here, from Pictou County, but the parties sending did not seem to use enough discretion in sorting the clay and slate from the ore, which generally carried something over 2 per cent of sulphur in the mixture.

It seems strange that Cape Breton, containing some of the most valuable coking coals in the Province, and reported to contain so much iron ore, should be so long in having any real information concerning extent and character of its deposits.

In conclusion the writer presents this paper to the Society, and the accompanying specimens, simply as a probable means of provoking discussion as to the general character and extent of the ores of the Province.

**Analyses.**

4.—BROWN ORES.				
	No. 1.	No. 2.	No. 3.	No. 4.
Fe <sub>2</sub> O <sub>3</sub>	67.14	84.67	51.449	68.01
MnO <sub>2</sub>	1.67	0.17	0.871	5.67
SiO <sub>2</sub>	15.60	2.37	16.755	5.40
CaO	0.87	0.22	0.180	2.50
Al <sub>2</sub> O <sub>3</sub>	4.11	0.21	6.70	.....
MgO	0.12	0.13	0.125	.....
S	0.03	0.001	0.123	.....
P <sub>2</sub> O <sub>5</sub>	0.13	0.077	0.460	.....
Vol	10.37	11.54	10.11	16.30
H <sub>2</sub> O	23.00	0.45	25.00	.....
Iron	47.00	59.17	36.014	47.61

- No. 1, Average sample West Mines Ore. (Small).
- No. 2, Fibrous Limonite, West Mines. "
- No. 3, Paint from Old Mountain under turf. "
- No. 4, Pugwash, Calcareous Limonite. "

5.—BROWN ORES (continued).				
	No. 5.	No. 6.	No. 7.	No. 8.
FeO	60.62	40.41	66.21	71.421
MnO	6.51	8.46	traces	2.87
SiO <sub>2</sub>	17.10	4.30	17.0	11.50
CaO	.....	14.78	0.21	0.75
AlO <sub>2</sub>	.....	.....	4.21	1.08
MgO	.....	.....	0.25	1.064
PO	.....	.....	1.36	0.102
Vol	.....	.....	0.32	0.140
HO	15.70	26.00	10.30	11.0
Iron	42.43	46.35	46.35	49.955

- No. 5, Pugwash, Calcareous Limonite. (Small).
- No. 6, do do do do do do do do.
- No. 7, Brown Ore. near Truro, containing iron pyrites (Small).
- No. 8, Average of Paint, from Old Mountain (Small)

6.—WHITE ORES AND ANKERITE.				
	No. 1.	No. 2.	No. 3.	No. 4.
FeCO	68.35	66.28	15.30	38.59
MnCO	1.00	2.75	2.57	2.85
SiO <sub>2</sub>	0.53	0.35	0.33	2.70
CaCo	2.66	9.0	69.71	1.53
MgCo	25.46	24.54	11.97	3.48
AlO	.....	.....	.....	.....
PO	.....	0.02	.....	.....
HO	.....	.....	.....	.....
Iron	32.85	32.0	7.37	42.76

- No. 1, Dark Pearl Grey, from East Mines; almost a true Mesitite (Small).
- No. 2, White Ore, Cream-colored, West Mines (Small).
- No. 3, Starry Ankerite, East Mines (Small).
- No. 4, Spathic Ore, Sutherland's River (Thorpe).

ANALYSIS No. 7.			
	No. 1.	No. 2.	No. 3.
FeO	.....	.....	43.75
MnO	.....	1.51	1.812
SiO <sub>2</sub>	.....	2.10	1.0
CaO	.....	16.10	22.90
AlO	.....	6.0	3.77
Vol	.....	38.50	36.87
MgO	.....	8.28	2.88
S	.....	0.075	traces.
PO	.....	.....	.....
Iron	.....	25.25	26.45

- No. 1, Average White Ore, Ankerite, &c., Slack's field (Small).
- No. 2, Average White Ore, Ankerite, &c., Totten Hill (Small)
- No. 3, Sample of Calcined Ore from kilns (Small).

**CORRESPONDENCE.**

**The Sydney and Louisburg Coal and Railway Co.**

SIR,—It would be interesting and instructive to learn the true why and wherefore of the very poor financial showing made last year by the Sydney and Louisburg Coal and Railway Co. So far as we residing in Cape Breton could judge, the company did a rushing business. Prices were better than they had been for many years and this company for the first time in its history, and with a mining of 170,000 tons, surpassed all the other Cape Breton mines in output. No accidents or strikes occurred and the despatch given to their time-chartered steamer carrying coal to St. Lawrence ports, was so satisfactory, that the net return for this, the greater part of their output, must have been considerably higher than that of most of their competitors, and yet we find that under these most favorable circumstances, their net profit was the paltry sum of £1,120!

Can you, Mr. Editor, throw any light upon this matter? I think it is one in which Canada generally, and Cape Breton in particular, are interested, inasmuch as disappointed shareholders are wont to blame the country, its people and its resources for the failure of an enterprise such as this and it would be grossly unfair that they should do so in this case.

It would not have occurred to me to apply for a notice of this subject in your columns, had I not recently read in a London financial paper a report of the last annual meeting of the company and noticed with astonishment that the chairman explained to the shareholders the expenditure of a large amount (over £4,300) by the statement that damage necessitating such an outlay had been done to the Sydney pier in April, 1891, by a "heavy impact with running ice." Now, Sir, no reputable resident in Cape Breton will say that any such impact ever occurred or that repairs of such cost were made.

When one sees large amounts explained away in this manner, and when, moreover, it is a matter of public notoriety that a syndicate composed of three of the company's prominent servants, have recently sold for a large sum to the company, coal areas which only cost them the amount payable for fees to the Mines Department, it is natural that suspicions should arise of a "nigger on the fence somewhere, and that protest should be made against blaming upon Cape Breton and its natural resources the failure of this company to make a satisfactory return to its shareholders until it is proved that such blame does not rest elsewhere.

Yours, etc.,

VERBUM SAP.

SYDNEY, C.B., 25th Oct., 1892.

**Another Quack Skips Out.**

SIR,—The notorious Robert H. Ahn has left here for parts unknown, and in the interests of mining it is to be hoped that he will never come back. He has done more harm to the mining interests of this district than any other man who has ever been here.

(1.) He persuaded a lot of tenderfeet (all respectable men) in Toronto, to go into a scheme for building reduction works at Nickel City, two years ago, and thereby hangs a tale. He knew nothing about building any more than about mining, and the works he put up are a laughing stock of the range. The mine is more like a habitan's barn than anything else. His object was to test a wonderful separator he had invented (patent applied for). But it would not work of course. The result was that the company lost some \$13,000 through him. All they realized was \$1,000 received for the machinery. The workmen had to take 75c on the \$1 for wages, after four months' waiting, and legal expenses, etc.

(2.) Last spring he took a contract to open up a nickel claim in Denison and get out ore, as explained in the enclosed letter (from Sudbury Journal of this week), but did not pay the men, and he tried to throw the blame on the Enmen's Metal Co. The poor men may whistle for their wages now, to the tune of \$400.

He left Sudbury the other day, without paying his office rent. There are numbers of judgments against him here and in Toronto. He said he was going to Montreal—to others that he was going to Boston—and coming back next spring to boom the range! But no one expects to see him back again.

Now it would be a good act for you to "head him off," as you did with Dolson, as he is a bad egg, and will doubtless turn up in some other mining region at his old tricks. I thought it my duty to let you know these facts, and you can make any use you wish of them.

Yours faithfully,

A. M.

SUDBURY, Oct. 25, 1892.

**Dobson in New Brunswick.**

SIR,—I read the remarks in your issue for August, also in your previous issues, with regard to Charles Miles DeTracy Dobson and the Critic, and the conclusion I draw is that you are quite correct in your proof that the Critic was deceived by this man as well as yourself, but I do not think it is quite in order to suppose the Critic is the greater fool—for the gentleman must have gained considerable experience in the art of deception between times. So much for that.

The issue of your paper of August quotes from the Critic that part of the gentleman's letter in which he re-

fers to his *experience* in mining, among others "New Brunswick, 1892." Now I know something about this experience, as I was present at his very arduous and extended scientific researches on that occasion. He expended exactly 40 minutes in actual work of examination of formation and extent of ore in sight in that year, and that was upon my property on Jordan Mountain near Sussex. In the same proportion his 15 other experiences would amount to 600 minutes more—in all quite an extended experience.

He, after his forty minutes' experience upon my property, as I understood, reported the property not worth more than \$15,000 in any event, but it was not developed as yet, and of course it was not worth anything, and this in the teeth of the fact that he would not undertake to say there was not actually 1,000 tons of ore in sight.

On this occasion I lent Mr. Dobson a printed pamphlet connected with the title to the property, which he was to return to me without fail. I have written to him to return it, but can get no answer. I sent a friend of mine to call on him at his office, and he informed me "there was a notice on the door that he was *absent* examining some mining property," and afterwards that as a matter of fact he had not been out of town at all. I have not yet had the pamphlet returned and am now inclined to think a great deal of what you say of him is true.

Yours, etc.,

F. W. STOCKTON.

SUSSEX, N.B., 26th Oct., 1892.

### Reflections after a Trip to Kootenay.

SIR,—In response to your request to give you a few remarks upon our late visit to the mining camps in East and West Kootenay, B.C., we now jot down some of our impressions of that locality which is engaging so much public enquiry and attention.

Former discoveries at Illicillewaet, Ainsworth, and elsewhere, have been eclipsed by the later and richer exposures of argentiferous lead ores in the Slokan district of West Kootenay. This region is now the ruling centre of attraction, and promises to become a veritable New Denver, as the town site near the Slokan lake is appropriately named. Even the Toad Mountain excitement is quieting down by the hope deferred of seeing the sale of the "Silver King" property realized, and while Nelson is suffering from this delay and disappointment, her rival, Kaslo city, steals a long march ahead.

I will not dwell upon the description of localities or geological phenomena, which have been well hackneyed of late, but confine my observations to a few generalizations equally important as factors in the future development of all mineral regions.

At the risk of being considered by some a somewhat unjustified pessimist, we must confess that the immediate future of the silver-lead mining industry in the West Kootenay, or even the Slokan, does not offer to us any covetous excitement, and we have not hesitated to advise our friends accordingly. The complex character of these lead ores have not received the careful investigation and recognition of practical metallurgists. The average prospector who creates a local and evanescent boom by his latest assayer's certificate of a "specimen" returning the silver away up in the hundred of ounces to the ton, much less thinks it necessary to obtain a reliable opinion upon the real market value of his find with due regard to presence of deleterious constituents.

The smelting properties of such ores and their adaptation to fluxes, and other complementary minerals easily procured in the locality, form a factor in the question of successful utilization of the minerals equally important with the conditions of fuel and transportation, but such matters do not disturb the fools' paradise of infatuated investors.

No doubt there are some properties in this remarkable region which will yield wealth to their owners in face of all handicaps by virtue of their high tenor in silver, and as a fact such ore is being sold to American smelters, and yield a good profit under the very heavy cost of present means of transportation, and a custom duty of over twenty dollars a ton; but these are the lucky numbers, or the plums of expert selection, and form an offset to the less fortunate enterprises.

Another just cause of present anxieties is to know the ultimate route of the "projected" railways; the powerful restrictions and influences of invested interests and existing charters are not likely to militate for the good of the many.

Existing circumstances indicate that, in spite of the McKinley tariff, the first phase of this new lead producing field will evidently follow the precedent of others in their first period of development, namely, to furnish its products as raw material for existing silver smelting centres, for our American neighbours with their experience in smelting problems are alive to the importance of securing a supply of such of our "wet" ores as may suit their demands; we shall thus be exhausting our mineral resources at a minimum of profit to ourselves, and see the more remunerative operations of metallurgy and manufacture effected on other territory by American labor, while the roads of transportation will to a large extent be constructed also by American capital. "None but the brave deserve the fair," and if British and Canadian capitalists are phlegmatic and slow in the race they cannot expect the prize.

The question of the disposal of lead in our own country is not to our mind so serious a one as at first sight. Cheap lead, as is the case with any other staple com-

modity, means a larger consumption of lead, but more than this, it would appear that a silver-lead ore which can withstand the heavy charges of transport to the American smelters, and pay a duty of one and a half cents per pound of lead, has a very large margin to encourage its treatment on our own territory, if only for the silver contained, and disregarding the lead altogether, unless the value of silver continues to depreciate.

While the silver-lead mining industry of the Kootenay thus offers unsolved problems and many risks, except to the favoured few, and the copper ore deposits equally demand the highest order of expert knowledge for their utilization, the simpler subject of "gold mining," which has hitherto been too much neglected in Canada, and especially in British Columbia, cannot fail to force itself upon the consideration of any observant traveller in that Province.

The history of all important gold producing countries commences with the gold "digger," or more properly, gold "washer," of the placers or river gravels, followed by the more steady quartz mining upon the subsequent discovery of the mother lodes or reefs. British Columbia has had its gold fevers thirty years back, and perhaps no country offers more extent of already known auriferous territory, and yet it does not so far possess a single working gold mine of any development, and this is the more extraordinary, as the difficulties of transportation and communication necessarily existing in a newly explored country do not exclude the feasibility of gold working to the same extent as they do the exploitation of other mineral wealth in the form of the baser metals. In the case of gold mining, our only care would be to carry in machinery and supplies to the location; the question of the transportation of hundreds of tons to market does not present itself as with the ores of the base metals, and the monthly product of a very large concern may be, in fact, contained within so small a compass and weight as to be portable by a single person, and consigned to the bank, where, after a few hours, required for the verification of the assay or "standard" of the bar, its equivalent in legal tender may be withdrawn, wherewith to pay current cost, and this without the disappointing fluctuations inherent to every other product.

Our short tour through only portions of East and West Kootenay, has been sufficient to impress us with the neglected gold deposits offering rich returns for the working, and leaving aside the hydraulic claims which usually present serious engineering difficulties, we are of opinion that no better opportunities for immediate legitimate investment in the Kootenays can be found than those offered by certain localities of the Selkirks in that region. The modern improvements in gold milling and reduction have rendered it possible to economically secure, say from 85 to 95 per cent. of the contained value, even from the formerly so-called "rebellious" or "refractory" ores; and *apropos* of this, while the Cassell or McArthur-Forrest Cyanide process is being extensively advertised in the West, let all persons who would think of adopting that process or plant avoid unnecessary expense by duly investigating the alleged validity of the patent rights claimed by the speculating syndicate formed for the purpose of monopolising, if possible, our Dominion, before they voluntarily manacle themselves by a binding contract; there is certainly no secret or difficulty in the process warranting the necessity of any assistance from this syndicate and the plant is only that of any other ordinary leaching or lixiviation process, but of this more anon.

To resume, Mr. Editor, after generalising our observations and notes from the very pleasant two months spent in East and West Kootenay we are inclined to think that profitable developments of the immense mineral wealth already exposed there, so far as silver lead ores and copper ores are concerned, will be slow to be realized, save for a few deposits exceptionally rich in silver, and many disappointments must follow the present inflated excitement, and much capital locked up for an uncertain period, and we would draw attention to the more readily realisable benefits to be secured by the investment of capital in the neglected gold resources of this and other districts in British Columbia.

J. LAINSON WILLS.

OTTAWA, Oct. 23, 1892.

**Endless Rope Haulage.**—The endless rope system of haulage, which has displaced the single rope system at the Mitchell Main Colliery, is described by Mr. T. W. H. Mitchell. At this colliery the Barnsley bed is worked on the long-wall system, at a depth of 307 yards. The engine is placed on the surface and runs at nineteen to twenty revolutions per minute, and drives the rope at about fifty yards per minute. The rope is  $1\frac{1}{4}$  inch in diameter, and is wrapped three and a half times around a taper drum  $9\frac{1}{2}$  feet in diameter. Trucks are attached to the rope by chains 12 feet long, one end being hooked to the draw-bar and the other end wrapped twice round the rope, and the hook brought across the chain when extended. Catches and means for returning the vehicles to the rails are fixed every few yards, and a guide rail is fixed between the two tracks to prevent the full trucks from fouling the empties. Illustrations are given of the general arrangement of the plant and of the forms of the pulleys and other details employed. An endless rope haulage plant has been laid down at the Kramstamine, near Konradsthal, in Lower Silesia. It has a total length of 1.7 miles, more than half of which is above ground. The wire rope used passes through forked prongs, one on either end of the wagon being hauled. —(Transactions of the Federated Institution of Mining Engineers, vol. 3, pp. 147-156.)

## LEGAL.

### WILLS vs. STEWART.

More Side-Lights on the General Phosphate Corporation—Sando tells how the Company Originated, and owns up to Fat Commissions—A Hundred per cent. not unusual in London.

The adjourned hearing of this suit was taken up by the Hon. Justice Malhiot at Aylmer on 3rd instant.

Managing Director Sando, Mr. J. Keith Reid, late one of the Corporation's mine superintendents, and others, gave evidence.

Mr. Brooke, in opening the case for the plaintiff, said it was not one which presented any very involved issues, either of law or of fact. The plaintiff sued for a commission on the sale of mining lands, and the main question to decide was upon what amount that commission had to be calculated. The action is based upon a letter written by the defendant, and handed to the plaintiff, couched in the following terms:

LONDON, Feb. 20th, 1890.

DEAR SIR:

In consideration of your professional services rendered, and now rendering, in connection with the sale of the following phosphate lands in which I am interested, that is to say: (a list of lands being here given) on a sale being effected of a part or whole of the foregoing properties, through the aid of your aforesaid professional services, I agree to pay  $2\frac{1}{2}$ % of the cash sale obtained.

GEORGE STEWART.

The defendant's pleadings seek to cloud the contestation by various pretensions, of which the court was not, he thought, likely to take much notice. For instance, it is denied that the sale was effected through aid of the plaintiff's professional services. In reply, he would say the evidence showed unmistakably plaintiff's part in bringing about the sale, and Mr. Stewart himself, when examined under oath, frankly acknowledged that he had paid to the plaintiff the sum of \$2,141 or thereabouts on account of this commission. It is not to be supposed that he would have paid this sum had not a commission been due. Another ground of defence is equally frivolous. It is, that after receiving the letter referred to, the plaintiff became the employee of the General Phosphate Corporation, and that the services in question were rendered by Mr. Wills, not in virtue of this letter, but as agent of the corporation. The first words of the letter show the hollowness of this pretension. They are: "in consideration of your professional services rendered and now rendering," and the Corporation was not formed until long after that time.

On the main question, upon what sum the commission should be given, the plaintiff had filed a deed of sale from the defendant to the General Phosphate Corporation. The price mentioned was £40,000, of which £10,000 was paid in cash, £20,000 in mortgage, which had been received and accepted by the defendant as the equivalent of cash, and £10,000 had remained in the hands of the Corporation as security for an outside liability contracted by defendant, i.e., he was to manage the mines for the Corporation, and he agreed to take out 10,000 tons of phosphate on or before a certain date. Defendant pretended that, not having fulfilled this obligation to the corporation he was not liable for a commission, but the plaintiff's counsel submitted that it was in evidence that he had another consideration for making this agreement, viz., his appointment as manager for the Corporation, and that, moreover, it was shown that he had compromised for this £10,000 by receiving £1,000 in cash and £5,000 in shares of the corporation, on which he should in any event pay commission at their par value. Plaintiff also urged his right to commission on this £20,000 received by defendant in securities. It was not contended by the latter that these securities were not worth that amount; but he claims to have paid commissions and other sums to the extent of over £14,000, and wished to exempt this from the plaintiff's claim. Mr. Brooke argued that although it appeared by the evidence that the defendant had actually paid £11,000 of this amount to one Knud Sando in return for his services in negotiating the sale, that the plaintiff was in no way party to the transaction, and not even aware of it; that the sum paid Sando was exorbitant and ridiculous; that Mr. Stewart had a right to pay him whatever sum he chose, but he should not expect to make the plaintiff contribute. The transaction between Stewart and Sando was in reality a fraud upon the General Phosphate Corporation, because the evidence showed that that Corporation was ignorant of the fact that it was paying £40,000 for property which its agent was purchasing for it for £29,000, and that the sale was made directly from Stewart to Sando in order to effect this fraud.

Mr. Ayleen, in his reply, said that there was not one particle of evidence in the record to connect the plaintiff, in any way whatever, with the sale. The witness Sando had sworn that he, himself, had gotten up the General Phosphate Corporation without any assistance whatever from the plaintiff, and that corporation had been formed for the purpose of making the purchase referred to by the letter on which the plaintiff relied. Defendant had only undertaken to pay the commission if the sale should be effected by the aid of plaintiff's professional services, and it was incumbent on him to show that these services had contributed to bring about the sale. On the contrary, the evidence went to show just the reverse. Immediately after receiving this letter the plaintiff appears to have

occupied himself no more in the matter, but started off at once for South America, where he remained away almost all of the time which intervened between the letter and the signing of the agreement of sale from Stewart to the General Phosphate Corporation. There was no proof even in what exhibits were consisted. It was shown that he had made some reports upon the property in question, but these reports had been paid for by the defendant some months before the giving of the letter in question. Mr. Wills had been examined himself and could not say what he had done except that he claims to have seen a few people and talked phosphates to them. Under the circumstances the plaintiff had no reason to believe he had any right to claim. Mr. Stewart had acted generously in the matter; he might have said to Wills, you did not really help to bring about this sale, and refused to pay him anything; but he did not do this. He said, we will not discuss that question; I will pay you a commission on the amount which I have actually benefited by the transaction. It was true that Sando had received an enormous commission, an exaggerated commission, it might be an exorbitant commission; but the defendant had paid it, and paid it willingly, because he was getting, even with the deduction of this commission and the further sum of £10,000 to be left on deposit, a very high price for his property. Under the circumstances a commission on the price realized is all that the plaintiff is entitled to.

Mr. Brooke made a brief reply, and the case was taken under advisement.

Mr. Sando's evidence is so interesting that we give it in full:

THE EARLY HISTORY OF THE CORPORATION.

Knud Sando, of London, England, aged 46, merchant and manufacturer, examined by Mr. H. Ayles, counsel for defendant:

I am neither related, allied or akin to, or in the service or employ of any of the parties in this cause. I am not interested in the event of this suit.

Q. Are you in the employ, or have you ever been engaged by the General Phosphate Corporation? A. I am their managing director.

Q. Do you know the properties sold to this Corporation by the defendant? A. Yes.

Q. Who organized and formed the General Phosphate Corporation? A. Myself.

Q. Did the plaintiff give you any assistance in doing so? A. No.

Q. Under what conditions, and for what considerations were the properties above referred to sold to the General Phosphate Corporation by the defendant in this cause, and who negotiated and brought about the sale thereof? Objected to the first part of this question as illegal. Objection reserved by consent of parties.

A. The properties were first offered to me by Mr. Butler and Mr. Gascoigne, brokers, of London, about the month of May or June, 1889; in October following, I believe, the defendant was introduced to me by those persons, and my subsequent negotiations for the purchase of the property took place with the defendant. After the General Phosphate Corporation was properly organized in the month of July, 1890, the property was offered amongst others by me to the General Phosphate Corporation, to the directors of the Corporation, and in September, 1890, the corporation agreed to purchase them, and to enter into a contract or a preliminary contract with the defendant to purchase those properties with others; the said contract specifying that the defendant was to work all the contracts of the corporation, and was to produce from them 10,000 tons of phosphate inside of 12 months from the date of the fixing of the machinery on the property; the price agreed upon to be paid was £40,000 total, on which the defendant was to receive £29,000. In payment of the purchase price he received £10,000 cash and a mortgage for £30,000. There was also a condition in his contract for the performance of his undertaking, that he was to forfeit £10,000 to the Corporation if he failed to produce that quantity of phosphate.

Q. Do you know whether 10,000 tons of phosphate were delivered? A. No; they were not.

Q. Please take communication of the document now produced, and marked Exhibit K1 (Stewart's commission note to Sando) in Evidence, and state whether it is a copy of the letter written by the defendant to you?

Objected to this question as illegal inasmuch as the defendant cannot avail himself in this cause of an agreement of the nature sought to be proved. Objection over-ruled. A. Yes; it is a correct copy of the letter which the defendant gave me.

Q. Had this letter any influence to induce you to take up the sale of these properties? A. No; it had no direct influence.

Q. Would you have gone and made the sale without that? A. No; certainly.

Q. Did it form the basis of your dealings with the defendant in future dealings? A. Yes.

Q. Please take communication of Exhibit K2 at Evidence, and state whether it refers to the same properties which are referred to in Exhibit K1?

Objected to this question as illegal inasmuch as the defendant cannot avail himself in this cause of an agreement of the nature of the one sought to be proved. Objection over-ruled. A. Yes; it is a copy.

Q. Does it refer to the same properties which are referred to in the other letter? A. Yes.

Q. Was it after the writing of Exhibit K1 that you took up the organization of the General Phosphate Corporation and the sale of these properties? A. No; I took up the organization of the General Phosphate Corporation 12 months before that.

Q. Was it after you had communicated with Mr. Stewart that you began to organize the General Phosphate Corporation? A. No; I only knew Mr. Stewart some months after I began to organize the Phosphate Corporation. The property was first offered to me, and I had hundreds from which to choose.

Q. Was it before or after you began to organize the General Phosphate Corporation? A. It was after I had begun.

Q. When was the organization of this company completed? A. In the month of July the company was organized, in the month of July, 1890. The preliminary contract for the purchase of the property took place in the month of September, and the complete purchase took place in the month of October or November; the details will show it. I had nothing to do with the completion of the purchase.

Q. Did the defendant agree to forfeit ten thousand pounds out of the twenty-nine thousand pounds referred to in Exhibit K1 on his failure to deliver ten thousand tons within one year.

Objected to this question as being illegal and as not being susceptible of being proven by oral evidence. Objection reserved by consent of parties.

A. Yes; it is included in the contracts.

Q. Please take communication of the document produced as Exhibit L in this cause, with the deposition of Mr. Benson, and state whether you are the Mr. Sando therein mentioned, and for what consideration the transfer mentioned in the certificate was made?

Objected to this question as illegal and irrelevant. Objection reserved by consent of parties.

A. That is a copy.

Q. You are the Mr. Sando that is mentioned there?

A. Yes.

SANDO'S HOODLE.

Q. I see that it is mentioned in this document that on the twenty-nine thousand pounds to be received by Mr. Stewart from the General Phosphate Corporation and which was secured by a mortgage, that you were proprietor of £11,000? A. Yes.

Q. What service did you render the defendant for that?

A. First, for the sale of this property, and afterwards for negotiating the sale of his mortgage; and as acting for Mr. Stewart, particularly as his agent for the sale of the property, and the mortgage after that.

Q. Did all these services for which these £11,000 were given, have reference to the phosphate properties sold by the defendant to the General Phosphate Corporation? A. Part of them, but not all; it arose out of that. They are the services which I rendered on the first sale of the property to the General Phosphate Corporation, and afterwards on the selling of the mortgage given in payment to Mr. Stewart.

Q. The mortgage referred to the property sold? A. Yes.

Q. And was for £30,000? A. Yes.

Q. I suppose that the execution of this Exhibit L was the following out by the defendant of the terms contained in Exhibit K1? A. Yes.

Q. Giving you £11,000? A. Yes.

Q. That would leave from the original price of the sale to the General Phosphate Corporation a balance of £30,000? A. Yes.

Q. On these £29,000 I understand that £10,000 were retained? A. Yes.

Q. By the Corporation? A. Yes.

Q. And were forfeited by the defendant for non-delivery of the phosphate? A. Yes.

Q. According to the contracts? A. Yes.

Q. What was realized by the sale of this mortgage after payment of the commission? A. I would have to speak from memory; but we were obliged to pay the discount and the assurance; to the best of my recollection it realized about sixteen thousand pounds net, after we had paid all the charges.

Q. And on the £16,000 how much did you retain in virtue of Exhibit L?

NETTED £9,000,000, BY SALE OF STEWART'S SECURITIES.

A. I netted a little over £9,000, because I paid all the expenses, the defendant realized between £5,000 and £6,000 in all, after having paid all the expenses and the expenses contributory to the sale.

Q. Are you aware whether the defendant in connection with the sale of this property was obliged to pay a commission to Kimberly & Co.? A. Yes; I know that judgment was rendered in this cause.

Objected to this question as illegal and irrelevant. Objection reserved by consent of parties.

Judgment was given in a case for £500 and the costs; in the other one I do not remember for how much judgment was given.

Q. Was it for a considerable amount? A. It was for at least £500 if not for more.

Q. Did all these commissions arise out of commissions on the sale of this property? A. Yes.

Q. When did you first see the defendant? A. I believe that it was in the month of October, 1889; it may have been September, but I believe that it was in the month of October, 1889, that he was first introduced to me.

Q. Did the plaintiff in this case render any services for the defendant subsequent to the month of October, 1889, which contributed to the sale of these properties to the

General Phosphate Corporation? A. No; not that I am aware of.

Q. In organizing the General Phosphate Corporation did the plaintiff assist you in any way? A. Not as far as organizing the company goes.

Q. Did the defendant in submitting the said property for sale furnish any reports from the plaintiff for a portion of it? A. Yes.

Q. What were the dates of those reports? A. I don't remember.

Q. Were they all dated before the interview which you had with the defendant? A. Yes.

Q. All dated before the month of October, 1889? A. Yes.

Q. Therefore, what was then the cash value of the sale of the properties sold by the defendant to the General Phosphate Corporation after deduction of all commissions? A. About £16,000; speaking from memory.

Q. Would that be after having deducted the commission of Kimberly & Co.? A. No; it had nothing to do with that.

Q. That would have to be deducted also? A. Yes.

Q. How long were you in effecting the sale to the General Phosphate Corporation, and how long afterwards were you in effecting the sale of the mortgage? A. After the organization of the Corporation, about the fifteenth of August, 1890, I submitted a memorandum showing all the properties offered the Corporation, and I recommended certain properties to be bought, including those of the defendant. The signature on the preliminary contract referring to the purchase was annexed about the 12th of September to the best of my recollection; but I had the properties under my consideration for about 12 months previous. The sale of the mortgage took quite a while—several months; it was only effected in the end of the winter, 1891.

Q. How many tons of phosphate did the General Phosphate Corporation receive from those properties up to the present time? A. About 3,000 tons.

Q. And for how many years have they been worked? A. From actual work it is 18 months since the machinery was fixed up on the property.

Q. Are you speaking particularly of those properties? A. No.

Q. But I am speaking of those properties sold by Mr. Stewart; can you give us an idea? A. No; I could not; perhaps about 1500 or 1600 tons which we received from the lots.

Q. And according to the contract the defendant was obliged to deliver 10,000 tons during the first year? A. No; on his property; on all the property of the General Phosphate Corporation.

Q. Did you organize the General Phosphate Corporation with the object of establishing phosphate industry in Canada? A. Yes; in Canada and elsewhere.

Q. And you wanted to recoup yourself of your expenses by organizing, and for the organization of this company by taking a commission on the sale of these properties, I suppose? A. Yes.

Q. Did the defendant have a complete title to all the properties referred to in these Exhibits, K1 and K2, when he was in London? A. No.

Q. Was he obliged afterwards to acquire a title to those lots? A. I believe that he was desirous to acquire a title according to the contract; I believe that he completed the title sometime afterwards.

Q. That was one of the conditions with the General Phosphate Corporation? A. Yes.

Q. Did the plaintiff take part in the drafting of this deed from the defendant to the General Phosphate Corporation? A. Not that I know of.

Q. Would you know it if he had? A. I believe so; I was present with the lawyers when they drew up a deed, and the deed was discussed; that is to say the preliminary contract. As to the other contract, I do not know anything about it. It was only a confirmation of the preliminary contract.

Q. Was the plaintiff there? A. No. Cross examined under reserve of objection.

By Mr. C. J. Brooke:

THE FAILURE OF THE GREEN PROSPECTUS AND THE PHOSPHATE TRUST.

Q. A short time before the General Phosphate Corporation was formed, were you instrumental in getting up the company known as "The Phosphate Trust"? A. No; we were incorporated from a company by that name.

Q. Whom do you mean by "we"? A. Myself and some other gentlemen in London.

Q. You issued a prospectus to that effect? A. No. Objection to this evidence as illegal and as not arising out of exam. testimony in chief. Objection reserved by consent of parties.

Q. Will you please look at the printed copy now shown to you, and will you state whether the same is not a prospectus of the Trust which we have just mentioned marked A 19? (the green prospectus of the Phosphate Trust) A. That is a copy of a draft of one of the drafts which were proposed, but which was never issued; you are asking me now whether this prospectus was issued. We printed about twelve rough drafts to try and negotiate the formation of a Trust, to organize this trust, but we were not able to carry out the intentions which we had then. It was only waste paper, it is not a prospectus.

Q. But it was intended to be a prospectus? A. Yes; if the thing went through.

Q. Did you have any conversation with the plaintiff concerning the Phosphate Trust or the General Phosphate Corporation? A. Yes, several conversations with him.

Q. When did you have these conversations with him?  
A. I believe that it was about the month of November or December, 1889, or the month of January, 1890.

Q. About what time was it that Exhibit A 19 was drawn up? A. At the end of July or the beginning of August, 1889.

Q. At that time there was a large quantity of phosphate lands for sale? A. Yes.

Q. And you as a broker had very many of these lands, these phosphate lands, under your charge for sale?  
A. Yes; not as a broker, but as an agent.

Q. As a commission agent? A. Yes.

Q. What made you choose, out of all those properties, what made you select the Stewart property? A. The reports of the experts that were given to us were principally the reason why we chose them.

Q. To the reports of what experts do you refer?  
A. To the reports of Mr. Wills and Mr. Attwood, and several others, of whom I don't remember.

Q. Are you positive that Mr. Attwood had at that time made a report of the Stewart property? A. No; he had not made a report on the Stewart property. I am speaking of the other properties which the Corporation bought.

Q. Therefore it was the report of Mr. Wills which chiefly led to the purchase of the Stewart property?  
A. It is very probable; I don't remember that any others reported on it. There were two or three experts who reported on other properties.

Q. Did the plaintiff see you in connection with the Stewart property?

#### THE EARLY HISTORY OF THE CORPORATION.

A. Perhaps I might explain it a little better: The plaintiff was introduced to me by a friend in London about the month of November, 1889, I believe, and it was at the time that we wanted to make this Phosphate Trust, and we had scheduled sixty thousand acres of phosphate land. A conversation took place between ourselves during which I proposed to the plaintiff with the object of employing him as an expert to report on properties which the Corporation might buy, and we agreed upon that; we even agreed upon the terms which were to be paid. I believe that we were to employ the plaintiff to choose those properties, to know what properties were worth buying for the Corporation. The organization went along, and in January or February the plaintiff left, and some time after that we all abandoned our efforts to form that company or trust. The idea of organizing was, that all the vendors should become the promoters, and should contribute towards promoting the company. There was some objection, and when I found that out, I took the organization of the General Phosphate Corporation, and in the month of May, 1890, the plaintiff came back to England, and when I saw him I agreed to recommend him as engineer to the General Phosphate Corporation; and afterwards I looked upon him as the engineer of the General Phosphate Corporation and as agent for the sale of lands. That was two or three months before the General Phosphate Corporation was put on the market; when the Corporation was organized, and when it was ready to name its engineer, I recommended the plaintiff to the Corporation, and he was appointed engineer to the corporation.

Q. Therefore, I understand that during the latter part of the year 1889, and the beginning of the year 1890, that the plaintiff was co-operating with you for the formation of a company towards the end of buying out Mr. Stewart? A. No; there was not much influence.

Q. How often did you see the plaintiff at that time?  
A. We met together several times.

Q. Why did you meet together? A. To discuss phosphates in general.

Q. Did you have any conversation with the plaintiff as to the directors of this new company which was to be formed?

Objected to this question as illegal, and as not arising out of the examination of the chief. Objection reserved by consent of parties.

A. It is very probable that I must have spoken to him about it as far as the directors were concerned, but I cannot say.

Q. That is to say the directors of the General Phosphate Corporation? A. It is very probable that I spoke to him about it; we had some general conversations.

Q. Is it not a fact that you had several conversations with the plaintiff, and that you discussed with him whom you would have as directors? A. No; I don't believe so; I know that I spoke to him as to who were going to be directors of the company, but I am sure that he did not know who was going to be directors. The one who helped me to organize the board was Mr. Mallaby Deeley.

Q. Is it not a matter of fact that in connection with this matter the plaintiff introduced you to Sir Charles Tupper with the object of having his name as a director?  
Objected to this question as illegal. Objection reserved by consent of parties.

A. The plaintiff introduced me to Sir Charles Tupper.  
Q. Did you request Sir Charles Tupper to put his name on the board of directors?

#### THE GOVERNMENT OBJECTS TO SIR CHARLES TUPPER.

A. He had been requested to put his name on the board of directors before that, and the plaintiff had told me that he thought he would get him on the board; he introduced me to him, and he told me that he would be a director if the Government would allow him, and they refused to allow him to do so.

Q. How is it that Mr. Wills was making suggestions to you as regards Sir Charles Tupper, if you state that he

was not co-operating with you in this matter? A. Let me tell you that if I had the least idea that the plaintiff had any monetary interest to sell in these properties that it would be impossible for me to have recommended him as engineer to the company; and all the properties which the plaintiff recommended to me, I accepted them with the view that he would be engineer for the company; and he assisted me only in the view of seeing the company organized, and as far as I was concerned, that he would be named engineer.

#### SANDO DOES NOT WORK FOR NOTHING.

Q. As to your commission from the General Phosphate Corporation, did the General Phosphate Corporation know that you were getting this property for £29,000 whilst they were paying £40,000. A. No; my company knew that I was receiving a commission but the amount was never stated.

Q. You were receiving about twenty-seven per cent.?  
A. I do not work for nothing. There are some companies, or parties, which receive one hundred per cent. on sales of properties to companies.

Q. Can you give us a statement of the securities which you received from the General Phosphate Corporation, through the plaintiff, as the £60,000 of purchase price to which you have referred, and of the amount which the securities realized, and the expenses which were incurred on their realization? A. Not more than I have told you.

Q. If the defendant said that he had received £7,600 on these £20,000, would you contradict him? A. I said that the net realization would not realize more than £6,000 in addition to the £1,000 cash; it may have realized more than that, but I do not remember; I am speaking from memory. I was not subpoenaed to bring my books here, and I cannot speak about all the accounts.

Q. Was the plaintiff aware of this agreement between the defendant and yourself as regards the £29,000? A. I have not the slightest idea whether he knew it or not.

Q. Are you aware that the defendant made an agreement after that with the General Phosphate Corporation by which he compromised this undertaking of his to get out 10,000 tons of phosphate? A. Yes.

Q. When you stated that you believed that he had only received £16,000 in all, did you take in consideration the amount which he received from the corporation under this last agreement? A. No; the two transactions took place 18 months apart.

Q. You know that the defendant received a large sum in shares of the General Phosphate Corporation? A. I do not know exactly the amount which he received in shares; I had nothing to do with the negotiations of that part of the proceedings. I should have added that that part of the negotiations took place before I was named director, and therefore it was only hearsay.

Q. What was the total amount which these £20,000 pounds of negotiable securities, mortgages, etc., realized? For how much were they sold? A. I believe £18,000, less £1,600 deducted and kept by the purchaser for the assurance premiums.

Q. And you yourself, took out of that £9,000 pounds?  
A. I took my balance, after having paid the expenses; I took my balance out of the £16,400.

#### SANDO ALSO POCKETS £11,000 STG. OF STEWART'S MORTGAGE.

Q. What was the balance which you took for yourself; what was the value of the expenses which you debited to yourself?

A. I do not remember; I figured on £11,000, less the expenses and the commission; I believe that I had about £1,000 of expenses, of legal expenses on it.

Re-examined under reserve of objections.

Q. To what legal expenses do you refer? A. To negotiate for the sale of the mortgage.

Q. As I understand the mortgage was sold for £18,000? A. Yes.

Q. And from this was deducted £1,600 for insurance premiums? A. Yes. There were two negotiations. On the first negotiation we were obliged to negotiate to assure the mortgage; there are some companies who assure mortgages; we were obliged to pay quite a large sum; we were obliged to pay for four years; this was a mortgage for five years, and after having negotiated the mortgage we negotiated the sale; if the company failed to pay the mortgage, the company would be obliged to pay, therefore it is very expensive; therefore after the assurance which we paid for one year, the insurance company charged the insurance premium for the following year during the balance of the mortgage.

Q. And that realized £16,400; that is to say, that left £16,400? A. Yes.

Q. Did you take £11,000 out of the £16,400. A. Yes; and I forwarded the balance, but keeping for myself a part of the expenses.

Q. What part? A. I do not remember; there were others which I considered as my own, and others which I considered as those of the defendant.

Q. What were these expenses? A. I had to pay the solicitor who came from Liverpool and who charged his work; the defendant paid the actual legal expenses for the transfer of the mortgage, and I was obliged to bear the other charges.

Q. That was independent of £1,600 which you paid for the insurance premium? A. Yes.

Q. Was the plaintiff appointed engineer for the company? A. Yes.

#### THE MANAGER'S SALARY.

Q. At what salary? A. £1,000.

Q. Did you consider that as a large salary? A. Yes; as a very good salary for a tip top man.

Q. When did you have this conversation with the plaintiff referred to in your cross-examination; was the plaintiff then acting as agent of the defendant? A. Not that I am aware of.

Q. Did he speak to you as agent for the defendant?  
A. Certainly not; otherwise I would not have recommended him to the Board.

Q. Did he seem to take more interest in Mr. Stewart's property than the one which the one which the corporation purchased? A. Not that I am aware of.

Q. In the figures which you have given as to the amount which the defendant realized, though you cannot give the figures, the exact figures, would you be out of £200 or £300 anyway?

Objected to this question as leading.

A. I am speaking from memory and I believe I would not be very much out.

Q. Did you ever pay the plaintiff anything yourself for any services which he ever rendered you personally in connection with the transactions which you were carrying on?

Objected to this question as illegal. Objection reserved by consent of parties?

A. I believe that I paid him £100 for certain expenses, for travelling expenses.

Q. In connection with what property? A. For any property in general, and for information which he furnished me personally.

Q. Relative to the sale of phosphate?

Objected to this question as illegal and as not arising out of the cross-examination. Objection reserved by consent of parties.

A. He was keeping me posted as to the standing of the mines, as to the samples which were found on various properties, and on the phosphate industry in Canada in general.

#### THE CORPORATION'S STOCK NOT WORTH MUCH.

Q. Was the stock of the company ever listed? A. No; it cannot be listed until two-thirds of the issued capital be subscribed.

Q. Can the shares be sold until it is listed; can any purchasers be found? A. Yes, often; but I do not say that we could sell any of the shares of this company at a good price, because the phosphate market is certainly down on account of the boom in Florida.

Q. Do you believe that a mortgage on these properties could be sold now for the net amount which you realized?  
A. No; certainly not.

Q. Did these transactions in connection with the arrangements which took place between the defendant and the General Phosphate Corporation take place recently—or when did they take place—as to the forfeiture of the £10,000? A. I believe in November, 1891.

Q. Do you know whether this forfeiture had been completely incurred with the company when this understanding was reached? A. The defendant acknowledged his inability to carry out the contract as I understand.

Re-cross-examined:—

Q. The time for getting out the phosphates was extended? A. That was part of the re-arrangement.

Q. Is it not a fact that the agreement by which the defendant received a sum of money and shares in settlement; is it a fact that the agreement had not taken place before this extended delay had expired? A. No.

Q. Are you positive as to that? A. No; not positive. The original twelve months expired only last April. This re-arrangement of terms was made in November last, by which the defendant surrendered his contract; therefore the extended time would be expired just now.

Q. Therefore, if defendant had continued to work at the mine, he would have had up till about November to carry out this contract? A. Yes.

Q. But this agreement terminating, it took place when?  
A. The first termination took place on the first of March last.

Re-examined anew:—

Q. Was there any possibility on the part of the defendant to distribute that amount of phosphate? A. No.

Q. 10,000 tons in a year? A. Yes.

Re-cross-examined anew:—

#### SANDO A GOLD MINER.

Q. Are you a mining hand yourself? A. Yes.

Q. Have you been engaged yourself in phosphate mining? A. No; in gold mining.

Q. Did you ever visit the mining lands in question? A. Yes.

Q. When? A. Two years ago last spring.

Q. If you have had no experience in phosphate mining how can you say that it was impossible for the defendant to carry out his contract for 10,000 tons? A. Because at the time the defendant abandoned his contract there was only one month to the end of the original term mentioned in the contract; during that time he had got only 3,000 tons, and therefore he could not deliver 7,000 tons in one month.

A chimney 350 feet high is being built for the Omaha and Grant Smelting Works, in Denver, Colo. It will be an octagon stack, 55 feet in diameter at the base, placed on a concrete foundation 18 feet deep, embedding 20 tons of steel rails. There will be two stacks, one within the other, with a ladder-way between. The stack will be banded with 4½ inch wide steel bands every 20 feet, covered by the brick work. The contract price is about \$53,000, and it is to be finished in 130 days.

**The Sydney and Louisburg Railway and Coal Company.**

**The Directors Report a Large Output and Heavy Expenditures at the Mine. Something Wrong.**

In view of the comments elsewhere on the operations of the Sydney and Louisburg Coal and Railway Company, we reproduce below the proceedings at the last annual meeting of shareholders, held in London on 1st July.

OUTPUT INCREASED TO 170,863 TONS.

The CHAIRMAN (Mr G. W. Medley) — Gentlemen: You have had the report and accounts, and I presume we may take them as read. You will see that last year we raised 170,863 tons as against 155,907 in 1890, and 121,600 tons in 1889. That is the largest quantity ever raised by this company, and under ordinary circumstances we should have had a very fair profit to show, but owing to causes which I shall tell you about, the anticipated profits though made could not be kept in the coffers of the company, but had to a large extent to be disbursed. I will now tell you how that came about. In the first place the general repairs and construction cost £1,328 more than in the previous year, and that was not an accident, but was due to the Sydney Pier in April, 1891, from a heavy impact of running ice. Of course repairs had to be made, but the outlay was increased by the discovery of a large amount of dry rot in the timbers of the pier. A report was obtained from the provincial engineer, and the repairs were effected as far as could be done, but there is still some small work to be done at that account. There has also been a rise in wages of £1,200. A demand had been made from the working miners in Cape Breton for an increase of wages, in some cases amounting to 15 per cent. on all the collieries. That was 6 cents, or 3d. a ton, but negotiations resulted in this, that a concession by all the collieries was made to give 3c., or 1 1/4d., or 7 1/2c. per ton. This we have the heavy item of £439 on new piping for water supply. The supply of water at the mines was failing, and increasingly so year by year. The Emery water was found unfit on account of its vicious action on the boilers, besides being insufficient during the summer months and having to be hauled by carts, and a Fox-Walker locomotive. A heavy charge was involved, and the conclusion was come to to lay a 3-in. pipe for 3,200 ft. from a brook to give a supply, which is continued to where the Emery water is used. There is also a charge of £1,968 against the year's profit. But as the report tells you, there were other charges on the revenue of the year. The first to which I shall call attention was £1,968 by way of depreciation. £1,762 was charged as shown in the statement presented last year, but as you are now aware we are acquiring a fresh area, having to do with an extent exhausted one of the areas now in our possession. We bought that new area for £3,000, and the payments for it are spread over five years, about £600 every year. We are writing off one third of all the payments we make until the whole of that £3,000 is exhausted, and if we add to the £1,762 of which I have told you £206, a third of the £600, you will find that the total is £1,968 for depreciation, as shown in the accounts. Then £4,000 arises from our writing off the payments on account of the stone drift and the new cars. This is the second year that amount has been written off. After that this charge will disappear from the accounts. Then, again, we, in extending our operations, opened up the Emery Mine, and £345 is charged against the account this year for that. That also is a charge which must be spread over the years, and after the current year, that is to say, 1892, payments on this account will also cease. These two charges of £2,313 and £2,967, make a total of £5,780 against this year's revenue account, which will fully account for the small balance left of £1120. Then the question is, what are we to do with that amount. Of course, we wish to divide it in the same old dividend, and, adding it to the amount brought forward last year (£554), we are enabled to pay 5 per cent., and absorb £1,500 of the £1,670, which stands at the credit of revenue account. I need not say that we had hoped for better things, but that is exactly the state of the case, and I am afraid that for this year we shall not be able to propose a larger dividend.

In all the business that has gone on the other side, I need not say that I shall have to ask the meeting to confirm that gentlemen's election. The retiring directors are Mr. Mills and myself, and, being both eligible, we offer ourselves for re-election. The auditor, Mr. John Paterson, also offers himself for re-election. With regard to

THE PROSPECTS OF THE CURRENT YEAR,

they have to some extent been clouded by the erratic conduct of at least one of our competitors in marketing coal at prices considerably lower than those which ordinarily rule in the Canadian market, but I would rather not refer further to this than to say that these companies have gone their own way in the matter, and must be considered to know their own business best. How their action will turn out as regards themselves, or ourselves, it is at the present moment a little premature to say. There is, however, a more serious matter to

which I must draw your attention, and that is the recent action of the Provincial Government in obtaining an Act of Parliament enabling it to raise the royalties on minerals.

THE INCREASED COAL ROYALTY.

The proposition for it came as a surprise upon us, and all the other mining companies of Nova Scotia. Of course, there were restraints from them. There were disputes over the terms of the leases. The Government refused to take either judicial opinion by a test case before the Courts, or to arbitrate, though the Hon. Mr. Fielding, the Provincial Secretary, had more than once declared that "he did not propose to invade the powers of the legislature, but only to exercise the rights under the leases." Legal opinion was also taken of prominent lawyers, and that opinion was that the legislature had not, as a matter of contract, any right to revise the leases, and there was a general consensus of opinion that the Supreme Court would decide in favour of the lessees. The result of it all was, as you have heard, that the Government had to fall back on its rights to break contracts by legislation, and so a retrospective act was passed. That act, I understand, raises the present royalty on coal of 7 1/2 per cent. per ton to 10 cents, until 1906, and then to a rate not exceeding 12 1/2 cents to 1926, and then the rate is to be at a figure not yet agreed upon for the remainder of the long lease, that is, until 1946. I need hardly say that this high-handed action has

CAUSED THE GREATEST DISSATISFACTION

throughout the province, and also a very uneasy feeling. It has acted as a damper on enterprise, and is, no doubt, calculated to injure the trade and prospects of the province. I understand that Mr. Hawkins is to move a resolution on his own account. My own opinion is that the board is generally disposed to agree with him, but to carry his motion bristles with legal difficulties and impossibilities, so that with all the willingness in the world, we should simply find ourselves powerless to meet his views. It is very near the hearts of the directors to do something with the arrears, but questions of circumstance and principle come in, and we think this is not the opportune time for taking action. Of course, some arrangement would be facilitated, if not altogether guaranteed, by our being able to dispose of our railway, but circumstances have militated against that. We have taken the precaution to ask our legal adviser to be present, and he will be able to tell you a great deal more about the difficulties of such a business. It is very true that Mr. Hawkins' view. I now move "That the directors' report and accounts as submitted to this meeting be approved and adopted."

Mr. J. G. MILLS (director) seconded the motion.

SHAREHOLDERS' GRIEVANCES.

Mr. HAWKINS: I have no doubt the directors will thoroughly understand that my resolution has no hostile intention towards them, but is simply designed to ventilate the subject of the grievances of the poor ordinary shareholders. It seems to me we have a company here which, on the face of it, is earning about £7,000 a year, and the total capital, according to the market prices of the Stock Exchange, is £150,000. To earn that we seem to spend about £100,000 a year, and I have thought the item of the chairman has explained as to increases of wages and repairs can scarcely be guarded against, but I do not understand whether they come under expenses at Cape Breton. The London expenses (£920) make a total expenditure of £4,000. I see the coal account shows a profit of £6,795, and the small amount of goods and passenger traffic is about £100,000. I think the shipping charges. It seems to me that these expenses are heavy. I have no doubt the difficulties are serious, and that it is rather impertinent to ask men who have been receiving 5 per cent. on their preference shares to reduce their rate of interest, but they must remember that in the event of a break up they have no prior lien, and would simply share with the ordinary shareholders. If, therefore, they reduced their interest 5 per cent., and had that as a first charge, they would have a much better security, and we should have a chance of getting a small dividend. It would also, in the event of more capital being required, be much easier to raise it. Still on the balance sheet put before us my ideas have been met, as my contentions were based on the balance sheet of the preceding year. As far as the company has been concerned, we have realised the point of prosperity indicated a year ago, but we have not made the desired profit. I think it would be better not to persevere with the resolution, but to leave it to the directors to see if anything can be done in the future to fund these back coupons, if possible, and make them enjoy a 5 per cent. dividend on something like that, and then we should get rid of the millstone about our necks. I beg to withdraw my resolution.

THE LEGAL OBSTACLES.

Mr. SLAUGHTER: The point is very simple. The regulations of the company determine the rights of the different shareholders, and one of them is clause 104. "That no dividend shall bear any interest against the company." Mr. Hawkins' proposal was that the back dividends on the preference shares, which are cumulative, should have been, so to speak, funded to bear interest, and be disconnected from the shares, so that all you require to be done out of current revenue would be not to pay arrears of dividend, but with the balance to pay a dividend upon the ordinary stock. I have only carried out one operation like that, and was under the necessity of applying to Parliament for leave to do so. We acted

under advice of Sir Horace Davey, and found we were bound to go to Parliament, and there appears no consideration of our memorandum or articles of association to give us the required power. No doubt one could issue deferred dividend warrants payable out of a particular fund, but that alters the memorandum and articles, so such a way that you cannot legally carry any such alteration into effect without the sanction of Parliament. It comes to this, that what Mr. Hawkins intended to propose, which seems very desirable, though I have not yet had any conference with the board, was impossible to carry out, unless you promote a Bill in Parliament for the purpose of getting the necessary legal powers to do it. The motion was carried unanimously.

ROUTINE BUSINESS AND THANKS.

The CHAIRMAN proposed, "That a dividend of 6s. per share on the 5,000 first preference shares be paid on or before the 1st Oct. next to such shareholders as are on the register at that date."

Mr. RUSSELL seconded the motion, which was carried unanimously.

The CHAIRMAN proposed, and Mr. Mills seconded, the election of Mr. Edmund A. Smith as a director, and it was agreed to.

Mr. MILLS proposed, and Mr. Brydone seconded, the re-election of Mr. G. W. Medley as a director of the company, and it was carried unanimously.

The CHAIRMAN proposed, and Mr. Smith seconded, the re-election of Mr. Mills as a director of the company, and it was carried unanimously.

Mr. BRYDONE proposed, and the Rev. B. P. Thompson seconded, the re-election of the auditor, Mr. John Paterson, at a remuneration of 20 guineas, and it was agreed to.

Mr. DOUGHTY BROWNE, in proposing a vote of thanks to the chairman, pointed out that the duties of the board, when the company was not going smoothly, were much more onerous than when it was going well. (Hear, hear.) The motion was seconded and carried.

The CHAIRMAN returned thanks, and quite endorsed the remarks that Mr. Browne had made.

**The Sydney and Louisburg Coal and Railway Co.—That "Impact of Ice" Flatly Contradicted from an Official Source.**

We do not suppose that our readers believe that we are so foolish as to make statements seriously reflecting upon the management of the Sydney and Louisburg &c. any other company, without careful enquiry and ample proof that our charges are as stated. One of the results of a careful investigation into the company's affairs in Canada, has been to elicit from the secretary of the Sydney Board of Trade a flat contradiction to the statement contained in the directors' report of material damage to the Sydney and Louisburg pier entailing heavy expense through an impact of ice. Indeed we understand that at the next meeting of the Board resolutions will be submitted repudiating the libel and condemning the action of the directors in giving to the public a report so hurtful to shipping interests of the port. The following correspondence, being but a small portion of the evidence in our possession, will be read with interest:—

VICTORIA CHAMBERS, WELLINGTON ST., OTTAWA, October 10th, 1892.

J. A. Gillies, Esq., P. O., Sydney, C.B.

DEAR SIR,—I notice in a recent issue of an English financial paper some reference to an impact of ice which created considerable damage to Sydney Harbor last winter.

May I ask if you can inform me of the date of the occurrence and the extent of the damage done? An early reply to this enquiry will greatly oblige.

Thanking you in advance for this courtesy, believe me, Yours very truly, B. T. A. BELL.

SYDNEY, C.B., October 14th, 1892.

B. T. A. Bell, Esq., Editor Canadian Mining Review, Ottawa.

DEAR SIR,—I am in receipt of your favor of the 10th instant inquiring as to the damage done to Sydney and Louisburg pier by impact of running ice during the winter of 1891. In reply I beg to enclose to you a letter under date 31st August addressed to me upon this subject by Mr. A. G. McLean, the Secretary of the Cape Breton Board of Trade. You will perceive that Mr. McLean's letter covers the ground of your enquiry.

Yours truly, J. A. GILLIES.

SYDNEY, C.B., August 31st, 1892.

J. A. Gillies, Esq., M. P., Sydney.

DEAR SIR,—Yours of the 27th inst. to hand and noted. I was not aware that any damage had been done to the Sydney and Louisburg Coal and Railway Company's pier until I saw the report of the company's agent to that effect in some of the newspapers. I have made enquiries of several reliable and competent citizens of this town, and they all assure me that no such damage as reported has been done in the harbor of Sydney through an "impact of ice." They say further, that such a report is a gross libel on the fair name of our magnificent harbour. Yours very truly,

A. G. McLEAN, Secretary C.B. Board of Trade.

**Coal Washing by the Luhrig Process.\***

By WALTER J. MAY.

Possibly there is no process of coal washing which is arranged the same as that of Mr. C. Luhrig, and certainly no process can be arranged where the whole output of the mine is dealt with by the one process, as by carefully designing the machinery all unnecessary labour is avoided. The process is a simple one, and, like most simple processes, is very efficient. The whole process is simply the grading or sizing of the coal, the separation of each grade into pure coal, coal and tailings, and pure tailings (the second or intermediate result only being crushed to separate the waste), and thus a lot of both mechanical and manual labour is saved. In nearly all other systems of coal washing, the whole of the coal is crushed and afterwards washed, thus reducing everything practically to one size before beginning to separate it. This may act well, but when it is considered that what is to be removed from the coal is usually well defined in bands or separate pieces, the necessity for crushing everything does not exist, while power is wasted and the capacity of the machinery reduced.

Probably, coal will average about 2.16 per cent. to 3.20 per cent. in ash held in combination with the coal, but in many samples of manufacturing coals—and here we take from cobbles downwards—the percentage of ash and waste will be as high as 15 per cent., and with careful treatment in washing, this can be reduced to the normal average of the coal without undue breaking, as a rule, as coal under 4-inch cubes are usually fairly clean in part, while that under 2-inch cubes will be cleaner still, the dirt, or shale, or brasses being dissociated from the coal to a very great extent, although the whole will be mixed together. The actual separation now will be simple, after sizing, and the dirty stuff would need little crushing to separate the last portions of coal. Taking a coal with, say 4 per cent. ash and waste, in buying 100 tons, we obtain 96 tons of effective heating material, whereas if 14 per cent of ash and waste has to be dealt with, we only obtain 86 tons of heating material for which we pay the cost of 100 tons. To assume a case we will suppose a coal in all charges put into the furnace costs 10s. per ton, and that handling the ashes and waste all charges will come 1s. 6d. per ton, and this will work out as follows:—

100 tons coal at 10s. ....	£ s. d.
Handling 4 tons ashes and waste at 1s. 6d. ....	50 0 0
	0 6 0
	50 6 0
Effective fuel for heating, 96 tons costing 10s. 5½d. per ton net.	
100 tons coal at 10s. ....	50 0 0
Handling 14 tons ashes and waste at 1s. 6d. ....	1 1 0
	51 1 0
Effective coal for heating, 86 tons, costing 11s. 10.465d.	

This gives an actual money increase of 1s. 4.715d. per ton, or in the case of a place burning 25 tons of either sort of coal only per week, the poorer coal would cost actually per year, £90 10s. 9½d. more in proportion to the work done than would be the case with the one that was freest from ash.

Putting the matter another way, and assuming that 25 tons of coal giving 4.0 per cent. waste just effects certain work, we find that in fifty-two weeks we use so much coal and move so much ashes, and taking preceding assumed cost for the sake of comparison, of the better coal we use 1,300 tons and handle 52 tons of ashes and dirt, the total cost being £653 18s. This coal has an efficiency of 96 per cent., and if we take the poorer coal with an efficiency of 86 per cent., we shall want more coal, and also have to move more ashes, and the coal in such case should cost less per ton. In fact, it would require 1,451 tons to do the work of the 1,300, and instead of handling 52 tons of waste we should have to deal with 203 tons. The price for this coal should be only 9s. 0.145d. per ton, but usually neither purchaser nor vendor makes the waste a matter of consideration. Clean coal is the cheapest in the end, and should always be insisted on, as there is neither rhyme nor reason in using dirty coal.

So far as the Luhrig process is worked in this country, no doubt the plant at the North Motherwell collieries of Messrs. Merry and Cunningham may be taken as being fully representative of the process now under discussion. In this plant about 1,500 tons of coal—as raised—is treated daily, and this is brought to a platform by means of rope drives, and here the hatches or corves are discharged by means of tippers on to vibrating screens of metal plates with round holes of about 2in. diameter, and all that passes these screens is washed, while the large passes on to picking tables, in which the ordinary plates are replaced by round rods having spaces between them, through which the dirt and small coal can pass, when dislodged, in dressing the large coal. This dry separation plant is in a separate building to the wet plant and in addition is worked by a separate engine so as to be independent of the wet plant. As the coal passes over the tables, stones and dirt are picked out, and the shale is chipped off any pieces where necessary, while the clean coal is delivered into waggons by the belt, which has an adjustable arm and is raised or lowered as required to prevent breakage of the coal as it falls into the waggon. In the sorting, clean stone and dirt free from coal is taken directly to waste and

is done with, but coal combined with shale or stone is taken to a coal breaker to be broken up for further treatment, and is carried back to the other dirty coal or dross.

Coming now to the wet separation, the whole of the dross is elevated to the top of another building, and at once delivered into a revolving drum, which sizes into nuts, beans, peas and dust, and from this drum the different sizes are conveyed by shoots to jigs, in which the coal is separated into three classes—(1) clean coal, (2) coal inter-mixed with shale or brasses, and (3) dirt free from coal. Only coal above ¾ in. is treated in these jigs, which are of special design, and made to treat large quantities. The waste is taken away to the pits by means of spouts, and the clean coal is taken over drainers into hoppers for loading, while the intermediate stuff is elevated to the top of the building to be crushed in a roller mill, and from here it passes to the proper jigs to be again separated. The fine coal from the sizing screens under ¾ in. passes with the overflow water from the nut coal jigs to special grading boxes, and from these it passes to jigs with suitable meshed grids, having felspar beds, and is there thoroughly cleaned, the dirt being taken to the pits, and from thence lifted to waggons for removal by means of an elevator, while the clean coal passes into a draining drum, whence the water and fine coal are taken to a sludge pit, and the pearls are conveyed to large storage hoppers. From the sludge pit the fine coal is collected by means of a patented sludge-recovery apparatus and lifted by an elevator either into separate hoppers or into the pearl coal hoppers, according to the use it is to be put to. Roughly this is the whole process, and the cost for labour in washing is practically ½d. per ton, and at Motherwell the ash is reduced from 23 per cent. to 2.5 per cent.

At Ellenborough Colliery, Maryport, a sample of the small coal held 13.78 per cent. ash before washing, and the pearls after washing 2.78 per cent., while the pearls and sludge mixed after washing 4.14 per cent. ash and 0.85 per cent. sulphur; 52 tons 13 cwt. treated for this result gave 46 tons 8 cwt. coal, and 6 tons 5 cwt. waste, in which there was 2.8 per cent. of coal, while the proportions of the cleaned coal gave 86.48 per cent. pearls and 13.52 per cent. sludge. Another sample of coal at the same colliery gave before washing 5.24 per cent. of water and 22.41 per cent. ash, while after washing, water stood at 4.94 per cent. and ash 4.48 per cent.

In a Scotch coal treated, the percentages of clean coals gave 41.84 per cent. of "treble" and "double" nuts worth 7s. 9d. and 6s. 9d. per ton f.o.r. mine, 30.61 per cent. "single nuts" worth 4s. 6d. per ton, 10.21 per cent. "peas" worth 3s. 9d. per ton, and 17.34 per cent. "sludge" worth 3s. per ton. Before washing this was a very dirty coal but now the ash hardly exceeds the fixed ash by a figure in the second decimal place, while instead of being worth from 6d. to 8d. per ton, it will run out over 3s. 6d. per ton on the crude.

Possibly the wetness of the washed coal will be objected to, but this wetness does not exist, as except with the sludge the water drains off very readily, and having had washed "peas" from Scotland the writer can say that the water was no trouble, but peas are too small for all boilers, and this occurred in the case of the boilers referred to. Nuts and beans, or all sizes above, say, ¾ in. cube should dry in a very short time when exposed to the air in waggons, and the cost of this detention would not be much.

For coking purposes the washing of the coal gives good results, and at the Ellenborough Colliery, Maryport, where the coal was regarded as non-coking prior to the erection of washing plant, good cokes have been produced, and the following will show what results are obtained. Slack before washing contains 22.41 per cent. ash, and after washing pearls (air dried) show 4.48 per cent. ash, pearl and sludge (air dried) 7.38 per cent. ash, and sludge (air dried) 11.90 per cent. ash. Now, taking these in the same order, pearls gave 50.72 per cent. coke, carrying 8.10 per cent. of ash; pearls and sludge, gave 53.05 per cent. of coke, carrying 13.40 per cent. ash; and sludge gave 51.52 per cent. coke, carrying 17.44 per cent. ash. Of course, this is not an average, and to get this it is necessary to take the average for some months, and if we take that of the coke made at the Maria-Anne and Steinbank Collieries, Bochum, Westphalia, it will be found that the average ash for March 1880 was 47.45 per cent., the highest being 50.31 per cent. and the lowest 40.99 per cent., while an average for the nine months ending March 31, 1880, gave a daily result of 4.7815 per cent., the lowest monthly average being 4.575 per cent., and the highest 5.096 per cent., the difference being 0.521 per cent. only, which shows how level and uniformly the process works. The percentage of coke to coal is not given, but assuming it to be 50 per cent., we get only 2.39 per cent. ash in the coal before it is carbonised. Prior to washing plant being put up, the coke carried 10 per cent. ash.

Pyrites or brasses, when sufficiently plentiful, can be saved, and are worth varying sums, according to their content, in some cases being sufficient to pay for the whole of the working expenses; but in any case they are worth separating, if in anything like appreciable quantities, but if not, then they can pass away to waste.

Coming to the cost of washing, we have to take all costs and charges in connection with the process, and then to this we have to add the loss in bulk, when this is worth anything. Take, as an instance, a crude slack, worth, in its dirty state, say 2s. 6d. per ton at the pit, and which contains everything under 1 in. Now the possibility is that quite 20 per cent. of separable waste exists in this, and that the clean coal would contain nuts and coal above ¾ in. to the extent of 50 per cent., the balance being coking stuff. Taking, say, 100 tons of this, we get a value of £12 10s. for the crude to start with, and, as we

lose 20 per cent. in bulk in the waste, this brings the average of the coal saved to an original cost of 3s. 1½d. per ton. Assuming that the nuts and beans are in equal quantities, and worth, respectively, 5s. 6d. and 4s. 6d. per ton, and that the coking stuff is worth 3s. 6d. per ton; we get as follows:—

	£ s. d.
40 tons coking coal (pearls and sludge), at 3s. 6d. ....	7 0 0
20 tons peas or beans (¾ in. to ¾ in.), at 4s. 6d. ....	4 10 0
20 tons nuts (¾ in. to 1 in.), at 5s. 6d. ....	5 10 0
	17 0 0

Taking the Luhrig Company's own maximum estimate of ½ of one penny per ton for dressing, we get 6s. 8d. as the cost of dressing only, but as there are other charges incident to all machinery which may well be taken as raising the charges to 3d. per ton on the crude, this gives £1 5s. as cost of dressing, and the account would stand then as follows:—

	£ s. d.
To 100 tons coal at 2s. 6d. ....	12 10 0
" Dressing, all charges, at 3d. ....	1 5 0
	13 15 0

Against this we have 80 tons sold and used as under:—

	£ s. d.
By 40 tons coking coal at 3s. 6d. per ton ....	7 0 0
" 20 tons peas at 4s. 6d. per ton ....	4 10 0
" 20 tons nuts at 5s. 6d. per ton ....	5 10 0
	17 0 0

This gives a net profit of £3 5s., and if 200 tons per day were treated for each of 300 days per year, we should get £3 5s. + 2 + 300 = £1,950 per year net profit, besides having to provide waggons for 12,000 tons less coal, which would be equal in working to five 10-ton waggons daily, hence the saving in waggon repairs would be considerable.

Naturally, every plant erected will have to meet the requirements of the variety of coal dealt with, and the purpose for which the clean coal has to be turned out, and this prevents any hard and fast lines being laid down either as to cost of working or cost of erecting; but as some idea of these charges may be worth having, it may be taken that an average cost for erecting plant for handling 1,000 tons per day would be £9,000, and the annual charges would be practically as follows:—

	£ s. d.
Depreciation 10 per cent. £9,000. ....	900 0 0
Interest at 5 per cent. on £9,000. ....	450 0 0
Repairs. ....	20 0 0
General charges, say. ....	380 0 0
Steam, wages, stores, process, &c., at 1½d. per ton. ....	1,875 0 0
	3,625 0 0

On 300,000 tons this is equal to 2.9d. per ton, but even allowing the cost to run out to 3d. per ton or £3,750, there is a good margin for profit, as clean coal will always sell where dirty coal will not.

For instance, at a certain works, 28 tons of coal (slack) was the weekly average consumption of 30 weeks, not more than 6 per cent. of waste coming from the boilers, and keeping an average pressure of steam of 50 lb. (the man in charge of the boilers was fined 2s. 6d. if the boilers blew off steam at 53 lb., or if pressure sank below 47 lb., and the fines were sharply enforced). This slack cost 13s. 9d. delivered, and averaged about 20 cwt. 42 lb. to the ton. Well, there was a new manager, who, of course, had new trades people, and he had a new coal, and this new coal was "screened nuts," at 12s. 6d. per ton for 21 cwt. net delivered; 98 tons were delivered, and lasted eleven days to keep up the steam needed, an extra man being put on to help the ordinary stoker, as over 40 per cent. of waste was produced (the actual weight being 39 tons 19¼ cwt.). The coal was good, what there was of it in a clean state, but in an unclean state it was little better than shale, and its value may be taken as follows:—28 tons of slack, plus 10½ cwt., cost £19 5s., which gives the price as 13s. 5.96d. per net ton, and in eleven days 44 tons would have been used on the average, and would have cost £29 13s. 10.24d. On the other hand, 98 tons plus 98 cwt., cost £61 5s., or 11s. 10.86d. per net ton, and to this must be added the extra labour, £2 4s. for the eleven days, which made the cost actually £63 9s. Compared together, the dear slack cost £2 13s. 11.84d. per day, and the cheap nuts £5 15s. 4.36d. per day. One experience of this kind was enough, and no more nuts were required, but had the nuts been clean, they would have been of more value as fuel than the slack, as sundry lumps which were analysed only gave an average of 1.031 per cent. ash.

A new mineral, not unlike asbestos in its properties, has been discovered in immense deposits in the United States of Colombia. It is stated to be the colour of amber, perfectly transparent, and incombustible. Experiments made at Bogota indicate that it will be of great value for the manufacture of bank-note paper, for fire-proof and water-proof roofing tiles, and for suits for firemen. A white varnish can also be extracted from it. The substance has been named bucara-manquina, and it is expected to prove of greater importance than asbestos.

\* Colliery Guardian.



### The International Mining Convention - Special Meeting of the General Mining Association of Quebec.

On Friday, 14th instant, a special meeting of the Council of the General Mining Association of Quebec was held at the office of the secretary, Mr. A. W. Stevenson, 17 St. John St., Montreal. There were present: Col. Lucke, (Beaver Asbestos Co.), Sherbrooke; J. Hurley-Smith, M.E. (British-American Phosphate Co.), Glen Almond; K. T. Hopper, (Anglo-Canadian Asbestos Co.), Montreal; J. Lanson Will, F.C.S., Ottawa; O. M. Harris, Montreal; J. Keith Reid, Buckingham, Que.; A. W. Stevenson, C.A. Montreal; and B. T. A. Bell, Ottawa. There were also present: Mr. R. G. Leckie, Managing Director Londonbury Iron Company, London, Ont.; Prof. B. J. Harrington, Prof. H. T. Bovey, and Dr. Johnson, of McGill University. In the absence of the president, Col. Lucke was called to the chair.

Mr. BELL, read the following letter from Sir J. S. D. Thompson, Minister of Justice, with reference to a grant from the Dominion Government:

OFFICE OF THE MINISTER OF JUSTICE,  
OTTAWA, 23rd October, 1897

DEAR MR. BELL. In reply to your letter of 14th inst. I beg to say that the application of the General Mining Association of Quebec, has received a very favorable consideration, and that we will be prepared to recommend to parliament that an appropriation of one thousand dollars be granted, in pursuance of the request.

(Sgd.) JOHN S. D. THOMPSON.

B. T. A. Bell,  
Secretary,  
Gen. M. A. of Quebec.

Mr. BELL stated that the American Institute of Mining Engineers, the Mining Society of Nova Scotia, the Asbestos Club, and other Canadian bodies, had been approached with a view to holding an international conference at Montreal, and favorable responses had been received. The date suggested by Dr. Raymond as favorable to a gathering of the members of the American Institute of Mining Engineers, was the third Tuesday in February, but a few days later would not signify if the Council desired to hold the Convention at a later date. The idea was that the American Institute should hold its annual meeting as the guests of the Association, and that an International Convention should be held at the same time at which Canadian mining laws, mining practice, and the mineral industries of the Dominion might form the principal subjects of discussion. At the last meeting of the Institute, held in Ottawa, about one hundred ladies and gentlemen were present, but this time was a busy one, and there was a strong likelihood that the attendance of Americans would be much greater on this occasion. With a strong representation from the provinces there should not be less than 500 present in February.

Mr. HURLEY SMITH was heartily in sympathy with the proposed Convention, but he thought that the Government of the Province of Quebec, having already received direct benefits from the last meeting of the Institute, should also be asked to contribute a grant. He proposed that the president, (Hon. George Irvine, Quebec), the vice-president, (Mr. James King, J.P.P.), Col. Lucke, and the secretary, be a deputation to wait on the Government respecting such an appropriation.

Mr. A. W. STEVENSON in seconding the motion, said he did not doubt that the City Council of Montreal would also do something for the visitors.

Mr. R. G. LECKIE said he was pleased to hear that the Institute was coming again to Canada. Canadians attending the Institute's meetings in the States were always received with the greatest cordiality and hospitality. We should do everything possible to make the occasion a success.

Dr. JOHNSON, on behalf of the University of McGill, said he had no doubt if the authorities were approached, suitable accommodation for meetings would be provided.

Prof. BOVEY referred to the reception given last year in the Engineering Building to the Electrical Engineers. He thought that a similar entertainment might be given at considerably less cost.

After some further discussion, full powers were conferred on the secretary to employ what help would be necessary to prepare a programme and make all arrangements. The following names were suggested as a Citizen's Reception Committee: Sir Donald Smith, M.P., Sir Joseph Hickson, Sir J. William Dawson, J. C. Curran, Q.C., M.P., Hon. Senator Murphy, Hon. G. A. Drummond, W. C. McDonald, E. B. Greenshields, Robert Cowan, W. R. Eldenhurst, R. B. Angus, Duncan McIntyre, Richard White, John Graham, A. P. Paterson, J. H. R. Molson, John Kennedy, C.E., St. George, City Engineer, H. A. Biddle, Hugh McLennan, Mr. Hannaford, Hon. Mr. Ogilvie, H. R. Ives, H. Beaupré, D. L. Lockerty, C. Cassin, F. Reulph, Dr. Braner, Consul-General, Knapp, James Burnett, R. Blackwell, Jonathan Hodgson,

Samuel Finlay, B. A. Peterson, H. R. Ives, F. C. Henshaw, Henry Bulmer, G. W. Eadie, Edgar MacDougall, Prof. Bovey, B. J. Harrington, W. A. Carlyle, R. McCall, and Dr. Johnson, with power to add to their number. The Council then adjourned.

### The History of Mining in the Province of Quebec.\*

J. ORLANDI, M.E., QUEBEC.

The mining industry in the Province of Quebec is relatively new, although since the first years of the colony the attention of the capitalists has been directed to that industry.

In 1590 we see that a mining license for copper, on the north shore of the Gulf of St. Lawrence, was granted to a nephew of Jacques Cartier. Under the French domination, in the seignioral concessions, a notice had to be given to the King of the mines which could be discovered. Later on, under the English domination, it was stated in the letters patent that certain minerals were reserved. Nevertheless we don't see any attempt to develop the mines.

In 1837 the iron works of St. Maurice were established and they used bog ore of the neighborhood of Three Rivers. This essay was the first of that kind in North America, and we must say that it was successful, that industry still existing; and several blast furnaces having been in operation at different times and at different points of this province. There are actually three blast furnaces utilizing bog ore, two at Drummondville and one at Radnor. This last one was re-built last year and is actually in full operation, producing 40 tons of pig iron per day.

We don't hear much about mines until 1846, when the gold mines of the Beauce region were discovered. In the meantime a few explorations were made. The Geological Survey began its work in 1852, then without success, was discovered in the Ottawa, petroleum in Gaspé Peninsula, and copper in the Eastern Townships.

In 1854 the Government regulated the sale of the mining lands, and stipulated that they would be sold at four shillings an acre.

In 1846 the Government granted a license for the working of gold in the Seigneurie of Beauport, covering about 70 square miles. The Beauport Gold Mining Co. is formed and begins work in the valley of the Gilbert River; gold is found in quantity in an alluvial form, the quartz being tried but without success; then the mining companies were troubled by the proprietors of the surface; law suits and riots were the result; the Government interferes and brings the whole before the courts, who decide in favor of the validity of the patent only in 1853. Unfortunately the result of all these troubles was to discourage the speculators and the miners, and that industry remained idle until now, when some essays are continued by enterprising men.

In 1864 the Government enacted the "Gold Mines Act of 1864," which determined the price of the gold mining lands, the right of the proprietors of the surface, and the conditions for the working of properties.

Previously to, and about 1860, a great deal of prospecting for copper was done; in 1864 the value of copper reaching 59 cents a pound. Explorations were made with success in the Eastern townships, and a large number of mines were then in operation, and amongst them those of Harvey Hill and Capetion, which are still working. The explorations showed that the copper ores existed over great number of properties. Many companies were then organized, but it is impossible to state what quantity of copper was extracted. Everybody knows that in the Eastern Townships there are two kinds of copper ores existing: 1. The rich ore, as the bornite and chalcocite, worked at Harvey Hill, but in relatively small deposits. 2. The low grade ore, as copper sulphate, which is found in large bodies in many places and mainly worked for the present at Capetion. This last ore containing, over 40% of sulphur, 2% to 5% of copper, and a small quantity of silver, is principally used as a source of sulphur for the manufacture of sulphuric acid, and exists in large deposits, being sometimes over 50 feet in thickness. Then the variations of the price of copper don't affect much that industry. It is not the same for the high grade ore, which is found in much smaller deposits. If we consider that the actual quotation of copper is 17 cents a pound, it will be then understood that the attention is brought principally on the poor but more abundant ore. The Nichols Co. manufactures sulphuric acid and also super-phosphate and chemical manures by using the Ottawa phosphate. Now the annual production of copper ore for this province is about 80,000 tons, coming principally from the vicinity of Sherbrooke. Indications of rich copper ore, and also of native copper, were lately found in the County of Matane, but we have not yet heard any particulars about that discovery.

About 1865, borings for oil were undertaken in the vicinity of Gaspé Basin. A small quantity of oil was there obtained, but the works were abandoned until two years ago, when several borings at different points proved again the existence of petroleum in this district.

In 1867, the attention of some Quebec and Montreal people was brought on the magnetic land on the north shore of the St. Lawrence, a strong company was formed, and Chas. Moise selected as the headquarters of their operations. The sand was concentrated and smelted on the spot, charcoal being used as fuel, and iron obtained

in the form of blooms, which were advantageously sold in the United States.

Unfortunately the American manufacturers, in 1875, ranked this product in the class of lar iron instead of pig iron, where it was before, thus raising the duties from 57 to \$33.60 per ton (1½ cents per pound.) Probably other technical and financial causes prevented the development of that industry, which was given up. Attempts were actually made to export that mineral in a rough state, but the American market with a duty of 75 cents per ton was not favourable.

In speaking of iron, we must mention that in 1867 a blast furnace was built at Hill (Ottawa), to use an important deposit of magnetic iron, but was in operation only for a few years. In 1872, near Ottawa, a bloomery furnace was in operation several years, using the ore at Haycock mine. In 1873, a company was organized, and built two blast furnaces at St. Urbain (Baie St. Paul), near a considerable deposit of titanite iron. These furnaces, after having produced at a very high price, a few hundred tons of pig iron, were abandoned and the material sold.

In 1880, the iron works of Drummondville were established and they are still in operation.

In 1866 a by-law was passed fixing the price of the mining concessions at \$1 an acre and stating also the conditions of the sale. A similar regulation was repeated in 1874.

About that time public attention was brought on the phosphate mines of the Ottawa, and asbestos mines of the Eastern townships. In 1875 an act was passed to regulate the sale and the conditions of working the phosphate mines; this industry was at its beginning. Numerous properties were open, principally in the Township of Portland, Templeton, Buckingham and Hull. In 1878, the shipment made was about 3,700 tons of phosphates. In the last years, important discoveries in different places in Europe and the United States, caused a variation in the price, but nevertheless, we can say that the Canadian phosphates, considering its high average (80%) will have a regular market, and I consider that if the production is not more important, it depends more on the irregularity of the deposits than on any other cause. Up to date the total production has been nearly 250,000 tons. We must add that there exist large deposits not yet worked on account of the absence of easy means of transportation. Since a few years phosphates of inferior quality are ground at Buckingham and exported to the United States, while the first-class phosphate is shipped to England in a crude state. The most important deposits are in the County of Ottawa, but we find phosphates also in the County of Pontiac, Argenteuil and Berthier, and lately a very fine green apatite has been discovered in the Township of Radnor (L'Annaplan), but so far as known in small quantity.

Nearly in the same time the asbestos industry grew at Thetford, Black Lake, and Danville, and the production which was of a few hundred tons in 1880, reached 8,000 tons in 1890. I will not take up your time with any reference to that industry, on which you are doubtless better posted. Asbestos has also been discovered in the eastern part of the Gaspé Peninsula and at Lake Temiscamungue; in this last part of the country in the same formation as that of the Eastern Townships.

In the Laurentian formation, principally in the Ottawa County, asbestos is found in numerous deposits, but the fibre is shorter although of good quality. I consider that to be profitably worked it should be treated by mechanical process to separate the fibre from the rock.

Mica is also found in numerous places in the Laurentian range and is extensively worked in the Ottawa County. Until two or three years ago only the Villeneuve mine was operated for white mica, but now with the new use of mica for electrical purposes, many mines of dark and amber mica are in operation, and every day we hear of new discoveries.

Plumbago, in a disseminated state, is found in many places in the same formation, and has been worked a little and manufactured, especially in Buckingham Township. Precious stones, not much considered until now, exist also in the same formation.

To conclude with the historical part of mining in this province, I must say that in 1880 a mining law regulating the sale and conditions of working for all kinds of mines, was passed.

In 1890 another act, based on an entirely different principle, was substituted for the law of 1880. In 1892 a new law was passed, based on the principles of the Mining Act of 1880, with some new dispositions, and repealing useless clauses.

Actually the mines in the Province of Quebec are regulated by the "Quebec Mining Law," 55, 56 Vic., Chap. 20.

To recapitulate the present situation of the mining industry in the Province of Quebec, we see asbestos, copper, phosphates and mica in regular operation; gold, iron, graphite and ore a little worked; important borings are made in Gaspé for petroleum—it exists in the centre of the province—serious indication of natural gas; moreover we have a mine of antimony at South Ham; one of Galena at the Lake Temiscamungue; and one of silver ore in Marlow, (Beauce). I must say also that there exist very large areas covered by peat, which may become useful as fuel.

Amongst the building and ornamental stones I will mention the Deschamps and Montreal limestones, granites of Stanstead and of Lake St. John district, marble of the Ottawa and Pontiac Counties, slates exten

\* Paper read before the Asbestos Club, October, 1896.



sively worked at New Rockland and found in different places of the Eastern Township, etc.

If we examine the map of the Province we see all the north part of the St. Lawrence and Ottawa rivers forming the Laurentian range unexplored, except a small band. On the other side of the river, the Eastern Townships are well prospected. From Quebec going south and east, except alongside the shore, the territory is unexplored as well as Gaspesia. We see, therefore, that a large field is yet open for exploration.

## MINING NOTES.

[FROM OUR OWN CORRESPONDENTS.]

### Nova Scotia.

#### Caribou.

The Truro Gold Mining Co. has bought out the remainder of the lease held by the tributers, and is now operating the property on company account, under the direction of Mr. Geo. W. Stuart, one of the owners. The shaft has reached a depth of over seventy-five feet, and shows some very rich quartz. Four tons hoisted in the early part of the month were judged worth over \$1,000. The machinery is now being overhauled and put in condition for steady work.

#### Central Rawdon.

Some work is being quietly done here by Mr. Dimock and associates, west of the old property. The results thus far have been very encouraging, the largest lode found being 15 inches in width and showing fairly in gold.

#### Fifteen Mile Stream.

It is announced that the Egerton Co. will permanently close work in this district this winter, unless pay ground is struck soon. The management contemplate hauling out the machinery in the snow and erecting it upon another property in a different district, which rumor says is Goldenville.

#### Montague.

On the 15th of the month, Mr. Woodhouse brought into Halifax a bar of 277 ounces, from the DeWolfe lode of the Nova Scotia Gold Mines, Ltd. The work of raising the landing, and erecting the gallows frame is nearly completed, and the cutting down of the footwall to make No. 5 shaft vertical, is going ahead with three gangs working 8 hour shifts. The small donkey hoist taken from the Waverley mine, will be used here for the main three compartment shaft. The total product of the mines since Aug. 1st, has been 748 ounces.

The boiler and engine bought from the old chlorination works at Waverley are to be set up on the Symons-Kaye areas, and will furnish the power for mining. This property, according to the Halifax *Herald*, has been transferred by Mr. Woodhouse to a syndicate for \$12,000 stg. cash and stock.

#### Oldham.

The sworn returns in the Mines office show that the first crushing from the property latterly acquired by the million dollar syndicate from Attleboro and Providence, gave 14 ozs. 9 dwts., from 30 tons of quartz, an average of \$9.40 per ton. In the September issue the yield per ton was put at one ounce, or \$19.50. We make this statement in correction.

#### Stormont.

The Richardson gold mine will be equipped with a 15 stamp mill by Matheson & Co., of New Glasgow. W. W. Howell & Co., of Halifax, are furnishing a hoisting engine with two spools. Matheson & Co. will furnish the boilers for the plant.

#### Uniacke.

In the Mount, Messrs. Madill and Archibald are working on the western end with a small crew of men, but with indications of final success. The mines of the old British and Colonial Land Co. have been pumped out and have been examined by an expert on behalf of the owners. This is the property managed in 1887 and 1888 by Capt. John Nicholls. Of the expensive mill built by Fraser and Chalmers, nothing remains but the shell of the building. The underground workings are reported to show abundance of quartz, but the levels and cross-cuts will need overhauling.

#### Waverley.

The 10 stamp mill of the West Waverley Co., Ltd., crushed 540 tons of quartz in 20 days run in September. This is believed to be the best record yet made in Nova Scotia on hard quartz. The ore was low grade.

The cross-cut tunnel into Laidlaw's Hill, East Waverley, is getting very wet, and the men expect to cut the Barrel lode daily.

### Quebec.

#### Templeton District.

Judge Dugas has been working a gang of about twenty men close to Perkin's Mills. About twenty-five tons selected mica is being won monthly. He has had an offer from a Montreal capitalist to equip the property with first class plant, employing forty hands, and \$10,000 for a half interest. The property looks well, although but thirty feet have been sunk.

On the Carey lot, McGregor Lake, Mr. L. K. Lee has taken out quite a quantity of amber mica, which at thirty-five feet has been cut out by phosphate. The phosphate is high grade, similar to that of the Blackburn mine; the show at bottom of pit is about 18 by 15 feet. Sixty tons have been taken out so far.

On the Charette, lot 4 in the 9th Range, the Templeton and North Ottawa Mining Co. has had five or six men working a show. There is an immense bed of crystals, many of which, however, are badly broken up. About five tons selected mica has been taken out.

About 100 men, including prospectors, are working mica in the district this year.

The Blackburn phosphate property is reported to have changed ownership. Only 15 or 16 men are now employed. The property never looked better. Last month about 250 tons lumps and about 150 tons sands and seconds were extracted.

The Electric Mining Company shipped last week 425 tons phosphate by barge to Montreal. The ore was shipped for City of Lincoln steamship to Liverpool. The analyses made by Prof. Donald gives 82.47 for the high grade and 74.48 for seconds and sand. Mining will be resumed at the Bull Dog next month.

Mr. C. Circkel leaves early in December for a six months' visit to Germany. He will likely return in the spring for the Templeton Asbestos Company.

The Wallingford and Hillman property, which has been closed down owing to Mr. Thomson's injunction, has a very good showing, both in mica and phosphates. About 25 tons of former and 75 tons phosphate has been taken out since June 1st.

In the Gore of Templeton about 30 men are working surface shows on four or five different properties.

#### Hull Township.

Messrs. Chas. Brennan and Wm. Powell are working 10 or 12 men on the Toby, lot 7 on 11th Range. The surface crystals are very large, and numerous scattered at the base of the hill. The title is assailed by Mr. T. J. Watters, who lately acquired an old mortgage. Some years ago this lot was worked by the late Mr. French for barytes.

McRae and Allan are working nine men on the Kearney, lot 6 in the 11th Range. About 15 tons mica have been taken out during the last 10 or 12 weeks. Deep tests on this lot are now being made with the Diamond drill.

The Nellie and Blanche mine, recently purchased from the Haycocks by Watters & Co., has been fully equipped with two drills, hoists, etc., and is turning out about 40 tons high grade mica monthly. A large deposit in a rear part of the property has been uncovered a few days ago. The crystals cut 14 x 10 clean.

The Horse Shoe Mine recently acquired by Messrs. Watters & Co., employs about 45 men. The output is very satisfactory, about 20 to 30 tons monthly.

Webster & Co. are working 30 to 40 men on their Cantley properties. The mica is all shipped to New York and Boston.

The McCuaig syndicate at Wilson's Corners are opening up some good shows on the McLellan lot. Mica mixed with high grade phosphate in paying quantities is now being taken out.

Fully 500 men are now engaged in mica mining in the Townships of Hull and Wakefield, and these districts are overrun with prospectors. Every settler carries samples to church, and the bars of the leading hotels on the road are profusely decorated with specimens of all grades and shades.

#### Lievres River.

In the Lievres district probably 75 to 100 men are engaged in mining and prospecting for mica. The biggest shows found this season are on the Little Rapids property.

Mr. Wm. McIntosh is working on the Union under royalty, and is taking very large crystals of high grade amber mica.

The continued depression in the European market is evidenced by the very limited extent of the phosphate mining operations in this district. The High Rock Mine with a reduced force of about sixty men has raised about 3,000 tons of all grades to date, about 2,000 tons of which has been exported. The Squaw Hill and Aetna mines of the British-American Phosphate Company are the only other mines being worked to any respectable extent. Recent mining has revealed some fine shows of the mineral, and the management are reported to be encouraged by the prospects of productive mining. Mr. J. B. Smith is contemplating the introduction of a plant of greater capacity.

The Weart's Plumbago mine is worked with a moderate force, and the output is reported satisfactory.

### Beauce District.

Mr. E. B. Haycock, Ottawa, is making a practical effort to demonstrate the value of the alluvial gold areas known to exist over a large area on the Chaudiere and elsewhere in this region. Last summer he acquired what is known as the Star gold mines, containing an area extending over 1,500 acres on both sides of the River du Loup. Mining is being carried on by a force of some sixteen men at a point about a mile distant by road from the settlement of Jersey Mills. Mr. Haycock states that from the quantity of gold already obtained and the indications of its existence on the property, he is satisfied that his venture will be a profitable one. An engine and boiler has been put in by Messrs. Carrieré Lane, & Co., of Levis, and a small portable three stamp mill is on the way from the establishment of Fraser and Chalmers, Chicago, for preliminary working. Over two miles of steel piping has been laid, and a drainage dam 250 feet long, 8 feet high, with a face of 24 feet, has been built. Buildings to accommodate a good working force have been erected. Either a Huntington mill or an ordinary ten stamp mill will be put in in the Spring. On the same property Mr. Haycock has found some promising veins of free-milling ore.

Mr. W. P. Lockwood has about fifty men operating on his Gilbert River gold mines. After many reverses and discouragements, Mr. Lockwood has struck good pay ground, and profitable working is assured.

Mr. A. McArthur, of Toronto, who has been working for some time with good results on the Gilbert River, is reported to have sold out to a Boston syndicate. The new company is arranging for suitable mining and milling plant.

Good pay ground has also been found by the force of men working under Mr. Capel on the Mill Stream.

### Ontario.

#### Marmora District.

The Hastings Mining and Reduction Co. is pushing forward the construction of its roasting plant. The works will be equipped with Blake crusher, Griffin mill, Walker-Carter roaster, arsenic chambers, drying pans, etc. Mr. Thos. Walker, of Philadelphia, is superintending operations. The plant which will cost in the neighborhood of \$20,000, will be completed by the end of December. The company is also mining on the Gatling and other properties, a few miles from the town of Marmora, under the direction of Mr. W. H. Wylie, formerly of Carleton Place.

Mr. Middleton-Crawford, Toronto, inventor of the Crawford Milling Process, has purchased, and is now operating the Belmont gold property (better known perhaps as the Lingham mine). Two Crawford mills are to be put in. An engine and boiler, the first of the plant to be used, was shipped on the 8th instant, from the works of H. W. Petrie, Toronto.

Mr. T. P. Pierce, who has been prospecting on lot 18, in the 1st Concession of Belmont, has brought in some fine specimens of free gold. He reports very favorably of the indications for profitable working given by the stripings done on the property.

The Crescent Gold Mining Co. of Marmora is working a force of men on their properties, under the direction of Mr. McDougall.

#### Sudbury District.

The Drury Nickel Company, under the management of Mr. T. Travers, is working briskly with a strong force. The mines have been equipped with an efficient smelter and machinery equipment. Shipments of matte are being made.

From the *Sudbury Journal* we learn that over twenty men are now employed at the Worthington mine putting the two old shafts in shape for working the mine on a large scale. A sleeping house, 22 x 42, for the workmen, is being built near the boarding house. The railway switch has been moved to the north side of the track for better convenience in shipping ore from the mine. Everything is being done in a business-like way. "Tis the march of the Cameron men."

It is reported that the Vermilion mine will be re-opened at an early date.

The supply of ore being sufficient for all requirements, the working force at Copper Cliff has been temporarily suspended.

From the *Sudbury Journal*.

After the quietest season in the history of mining in the district, we are happy to be able to report that things are beginning to look up again on all parts of the Range, and that the prospects of mining here are much brighter this fall than they have been for the past two years. The closing down of the Blezard and Worthington mines last fall, combined with various other circumstances, had a very depressing effect for a time, but both these mines have been started again under new and vigorous management, and evidently with the intention of carrying on more extensive operations in the future.

All the other old mines are being worked as usual, except that a smaller number of men are being employed under-ground in the Copper Cliff mine. But this reduction of the staff is said to be only temporary, and due to the fact that enough ore has been got out already this year to keep the smelter going all winter.

Down the Range, the Travers mine has been well explored, showing a large body of high grade ore, and the smelter is now in full blast. A tramway has been built from the mine to Worthington siding, a distance of four miles.

The Finlander's claim, which has been purchased by Philadelphia capitalists, is going to be opened up this winter, as well as two and probably three other properties in Denison and Graham.

On the property owned by Judge Tomes and Mr. Weddell, near the Blizard, Messrs. Glenow & Callahan, have done a lot of development work, with good prospects, and this firm have also been opening up and developing the Bonanza mine on Lake Wahnapike, which we are informed looks exceedingly well.

So that altogether a good deal more development work is going to be done in the district this coming winter than in any previous season, with almost the certainty of new and increasing activity and interest in mining here next spring.

This marked improvement in the outlook of the district is owing to several causes. The demand for nickel is growing slowly but surely every year, and with all the successful experiments that have been made there can be no serious doubt any longer that nickel-steel is destined to be the leading metal of the future for many purposes. New and cheaper methods of treating nickel ores and making nickel alloys are being studied out, and especially in the United States. Last but not least, it is universally conceded that the main supply of nickel for the whole world will have to be obtained from the mines of this district. Capitalists are beginning to realize these important facts, and to foresee that a good nickel property is the best mining investment that any one can make now.

**CANADIAN COMPANIES.**

**Truro Gold Mining Co. (Ltd.)**—Gives notice of application for incorporation under the Companies Act of Nova Scotia. Authorized capital, \$100,000, in 1,000 shares of \$100 each. The directors are: Thos. G. McMullen, lumber merchant, Truro; Gardner Clibb, Truro; Joseph J. Snook, Truro; George W. Stuart, Truro; John H. McKay, Truro; Wm. Fraser, Truro; Lucius B. Crowe, Truro; and J. B. Neily, of Halifax. Formed to acquire and work gold areas in the district of Caribou or elsewhere in Nova Scotia.

**River Hebert Mining Company (Ltd.)**—Gives notice of application for charter of incorporation under Nova Scotia laws. Capital \$9,000, in 99 shares of \$100 each. Head office: Amherst, N.S. Directors: Gilbert Seaman, Minudie; Amos Seaman and Rufus S. Hubbard, Lower Cove, N.S.; A. R. Diekey and J. M. Townsend, of Amherst. Formed to mine, quarry, win, etc. coal, iron, stone and other minerals.

**Gold Queen Mining Company**—Registered at Victoria, B.C., 30th September, 1892. Authorized capital, \$400,000, in 4,000 shares of \$100 each. Formed to locate mines and develop the same, and buy, sell, lease and operate mines, mining stock and properties, etc. Head office, Vale, B.C.

**The Coal Hill Kamloops Mineral and Mining Company (Ltd.)**—Gives notice for charter of incorporation under British Columbia Act. Capital, \$150,000, in 1,500 shares of \$100 each, with power to increase the same to \$500,000. Trustees: Henry E. Edwards, John A. Webster, and Joseph W. Vaughan, all of Vancouver, B.C. Head office: Vancouver, B.C. Formed to purchase and acquire all rights and privileges in certain coal lands and mines owned and carried on by H. V. Edwards, J. A. Webster and J. W. Vaughan, at or near the town of Kamloops, in the Province of British Columbia, and carry on the same, etc.

**Ontario Silver and Antimony Company (Ltd.)**—Gives notice of application for charter of incorporation. Authorized capital, \$150,000, in 150,000 shares of \$1. Head office: Toronto. Formed to carry on mining in

Township of Barrie, in the County of Frontenac, and elsewhere in the Province of Ontario. Directors: Isaac M. Scott, contractor, Township of York; James C. Cockburn, Toronto; and John Critchley, contractor, Toronto Junction, Ont.

**The Thomas Nightingale Pressed Brick Company of Toronto**—Gives notice of application for charter of incorporation. Authorized capital, \$50,000, in 1,000 shares of \$50 each. Head office: Toronto, Ont. Directors: W. Van Alstine Cook, druggist, Toronto; Charles Henderson, barrister, Toronto; and Mrs. Margaret Nightingale, Toronto. The operations of the company are to be carried on in the Counties of York and Peel, and the city of Toronto and elsewhere in the Province of Ontario.

**Indian Lake Mining Company**—Authorized capital, \$50,000, in 2,500 shares of \$20 each. Head office: Toronto. Directors: Wm. Harty, Kingston, Ont.; T. W. H. Leavitt, Toronto; and J. C. Judd, barrister, Toronto. The operations of the company to be in the Counties of Frontenac and Leeds in the Province of Ontario.

**The Tache Gold Mining Company of Ontario**—Authorized capital, \$500,000, in 5,000 shares of \$100. Head office, Chatham, Ont. Directors: Samuel Barfoot, Chatham, Ont.; Joseph S. Butler, Chatham, Ont.; George C. Scott, Chatham, Ont. Formed to acquire and work mineral lands within the district of Rainy River, Ontario.

**The Low Phosphorus Ores Properties Company of Ontario (Ltd.)**—Authorized capital, \$350,000, in 3,500 shares of \$100. Head office: Toronto. Directors: Frederick, T. Jones, New York; Dr. Colin McDougall, New York; C. W. Gleason, Passaic, N.J.; Robert Fyfe Brooklyn, N.Y.; and T. D. Ledyard, Toronto. The operations of the company are to be carried on in the Counties of Haliburton and Peterborough, and elsewhere in the Province of Ontario.

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ANY person may explore Crown Lands for minerals.  
Mining lands may be taken up as surveyed loca-  
tions or staked claims.

Locations range from 40 to 320 acres.  
Claims range from 10 to 20 acres on vein or lode.  
Locations may be acquired in fee or under leasehold.  
Price of locations north of French River \$2.50 to \$3.50  
per acre, and south of it \$2 to \$2.50 according to distance  
from railway.

Rent of locations first year 60c. to \$1 per acre, and  
subsequent years 15c. to 25c. per acre.  
Rent of claims, \$1 per acre each year.

Claims must be worked continuously.  
Royalty on ores specified in the Act, 2 to 3 per cent. of  
value at pit's mouth less cost of labor and explosives.  
Royalty not charged until seven years from date of  
patent or lease, nor (as provided in s. 4 (3) of the Mines'  
Act, 1892) until fifteen years in the case of an original  
discovery of ore or mineral.

Original discoverer of ore or mineral on claim entitled  
to stake out a second claim.

Crown Lands sold under provisions of mining laws in  
force prior to 4th May, 1891, exempt from royalty.

Copies of the Mines Act, 1892, may be had on applica-  
tion to

**ARCHIBALD BLUE,**

Director Bureau of Mines.

TORONTO, April 24, 1892.



**J. LAINSON WILLS, F.C.S.**

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lurgy (Eng.), and of the American Institute  
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Reports on Mines and Mineral Lands.

The Sale or Purchase of Mines and  
Mineral Lands Negotiated.



## PROVINCE OF NOVA SCOTIA.

# Leases for Mines of Gold, Silver, Coal, Iron, Copper, Lead, Tin

—AND—

# PRECIOUS STONES.

TITLES GIVEN DIRECT FROM THE CROWN, ROYALTIES AND RENTALS MODERATE.

### GOLD AND SILVER.

Under the provisions of chap. 1, Acts of 1892, of Mines and Minerals, Licenses are issued for prospecting Gold and Silver for a term of twelve months. Mines of Gold and Silver are laid off in areas of 150 by 250 feet, any number of which up to one hundred can be included in one License, provided that the length of the block does not exceed twice its width. The cost is 50 cents per area. Leases of any number of areas are granted for a term of 40 years at \$2.00 per area. These leases are forfeitable if not worked, but advantage can be taken of a recent Act by which on payment of 50 cents annually for each area contained in the lease it becomes non-forfeitable if the labor be not performed.

Licenses are issued to owners of quartz crushing mills who are required to pay

Royalty on all the Gold they extract at the rate of two per cent. on smelted Gold valued at \$19 an ounce, and on smelted gold valued at \$18 an ounce.

Applications for Licenses or Leases are receivable at the office of the Commissioner of Public Works and Mines each week day from 10 a.m. to 4 p.m., except Saturday, when the hours are from 10 to 1. Licenses are issued in the order of application according to priority. If a person discovers Gold in any part of the Province, he may stake out the boundaries of the areas he desires to obtain, and this gives him one week and twenty-four hours for every 15 miles from Halifax in which to make application at the Department for his ground.

### MINES OTHER THAN GOLD AND SILVER.

Licenses to search for eighteen months are issued, at a cost of thirty dollars, for minerals other than Gold and Silver, out of which areas can be selected for mining under lease. These leases are for four renewable terms of twenty years each. The cost for the first year is fifty dollars, and an annual rental of thirty dollars secures each lease from liability to forfeiture for non-working.

All rentals are refunded if afterwards the areas are worked and pay royalties. All titles, transfers, etc., of minerals are registered by the Mines Department for a nominal fee, and provision is made for lessees and licensees whereby they can acquire promptly either by arrangement with the owner or by arbitration all land required for their mining works.

The Government as a security for the payment of royalties, makes the royalties first lien on the plant and fixtures of the mine.

The unusually generous conditions under which the Government of Nova Scotia grants its minerals have introduced many outside capitalists, who have always stated that the Mining laws of the Province were the best they had had experience of.

The royalties on the remaining minerals are: Copper, four cents on every unit; Lead, two cents upon every unit; Iron, five cents on every ton; Tin and Precious Stones; five per cent.; Coal, 10 cents on every ton sold.

The Gold district of the Province extends along its entire Atlantic coast, and varies in width from 10 to 40 miles, and embraces an area of over three thousand miles, and is traversed by good roads and accessible at all points by water. Coal is known in the Counties of Cumberland, Colchester, Pictou and Antigonish, and at numerous points in the Island of Cape Breton. The ores of Iron, Copper, etc., are met at numerous points, and are being rapidly secured by miners and investors.

Copies of the Mining Law and any information can be had on application to

**THE HON. C. E. CHURCH,**

Commissioner Public Works and Mines,

HALIFAX, NOVA SCOTIA.

## SOME REMARKABLE RESULTS IN GOLD EXTRACTING.

New York *Sun*, Sept. 12.—“The Crawford Gold extractor, which was recently put into the Richmond Hill at Hillsborough, New Mexico, is giving satisfaction. It has been tested on runs of ores from different mines in the district with uniform good results.”

Salt Lake *Times*, Aug. 28.—“Mr. Woodman came in from Deep Creek yesterday, where he has been for a month or six weeks, and he pronounces the Crawford mill a perfect success, saying that since the mill started it has saved 92 per cent. of the assay value of the Gold Hill ores, some of which are very rebellious.”

John C. Smith, Supt. of the Ogema Mining and Smelting Co., says: “It gives me great pleasure to add my testimony in favor of the Crawford mill in every way, as to its ‘gold saving qualities,’ ‘practically no loss of mercury,’ ‘small volume of water required per ton of

ore,’ great ease of manipulation,’ also as to its portability to mines remote from railroads, and ‘ease of setting up ready for operation.’”

L. J. Boyd, M.E., Supt. Montagu Mines, after personally supervising a test on arsenical ore says: “The results were simply wonderful. I am personally perfectly satisfied with this system of ore treatment, and should advise its adoption, as the experiments were carried on by my personal superintendence. Similar ore was treated by the Montagu stamp mill showing a difference of 100 per cent. in favor of the Crawford mill.”

Fredericksburg, Va., *Free Lance*, Sept. 6.—“L. G. Johnston, of this city, in an interview, said he sent to the M.G.E. Co., N.Y., one ton of very low grade sulphuret ore from the mines of the Powhattan L. & Mining Co., Culpepper Co. He went to New York and personally

witnessed the working of the ore. The results of ten different samples of ore, averaging in assay value from \$2.13 to \$7.35 per ton, showed a saving of 88 per cent. of the value by actual mill run, this without the use of chemicals or fire. These results were so satisfactory that a large sized mill will be placed on the property at once.”

W. D. Sutherland, Secretary of the Salisbury Gold Mining Co., of Nova Scotia, after having over 4 tons of ore treated by the Crawford mill, says: “Sample of the tailings taken during the run showed by assay an equivalent to 0.033 oz. to the ton. This evidence of the capability of the Crawford mill to extract all but a trace of the gold which the ore may contain must be considered of importance by all who are interested in the question of improved methods of milling gold from the ore. The test alluded to was made under the supervision of our company through trustworthy agents.”

### THE CRAWFORD MILL WORKS MORE CHEAPLY,

and saves from 20 to 50 per cent. more gold than the ordinary stamp mill, while it also successfully treats at less than \$1.00 per ton many refractory ores otherwise impossible to treat save by costly chemical processes. Complete working plant at 589 Hudson Street, New York, where samples of ore will be treated free of expense. Descriptive pamphlet mailed on request.

### THE MECHANICAL GOLD EXTRACTOR CO., W. O. ROSS, Secretary, 47 BROADWAY, NEW YORK CITY.

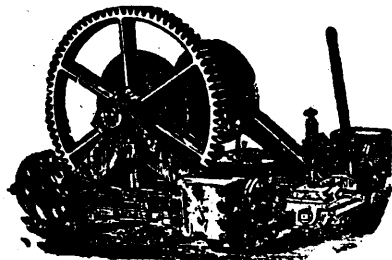
Plants will be erected at Marmora, Ont., and Halifax, N.S., where arrangements can be made for the treatment of ore samples.

A. W. CARSCALLEN, MARMORA, AGENT FOR CANADA.

GEORGE MACDUFF, WAVERLY, N.S., LOCAL AGENT FOR N.S.

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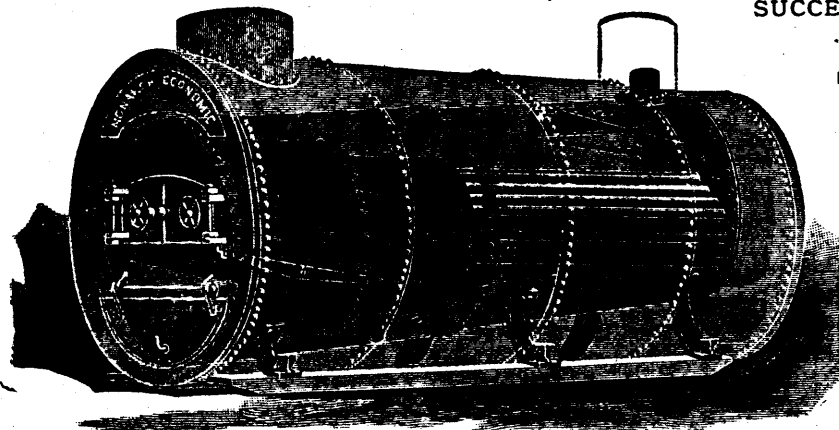
It is the strongest and most portable boiler in use, and its high economy in fuel makes it specially valuable. Tested evaporation, 10.25 lbs. of water per lb. of combustible from ordinary Nova Scotia Coal.

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