

MARITIME MORNING RECORD AND COAL AND METAL TRADES JOURNAL

Dr. R. Bell
Geol. survey dept.

Cumberland. * Pictou. * Cape Breton. * Inverness

New Series Vol. 7 No. 19

April 12th, 1905

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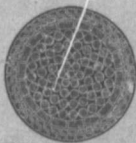
AGENT: H. M. WYLDE, P O Box, 529 HALIFAX N. S.

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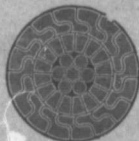
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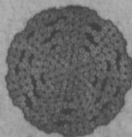
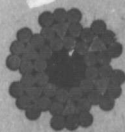
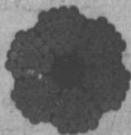
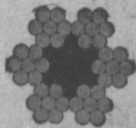
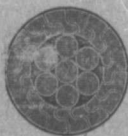
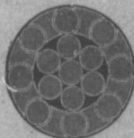
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62 Mixed for Pictou	7.45
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19 Express for Sydney	11.15
28 Mixed for Pictou	12.30
66 Mixed for Truro	14.40
20 Express for Halifax and Montreal	14.45
142 Mixed for Pictou	14.45
85 Express for Sydney	16.50
101 Mixed for Pictou Landing	18.10
22 Mixed for Hopewell	18.45
77 Mixed for New Glasgow	18.45
23 Express for Halifax	21.15
17 Express for New Glasgow	21.30
66 Express for Pictou	21.30

—TRAINS ARRIVE AT STELLARTON

78 Mixed from Trenton	6.55
62 Express from Pictou	19.35
18 Express from New Glasgow	7.55
21 Mixed from Hopewell	7.55
62 Mixed from Truro	8.00
27 Mixed from Mulgrave	12.19
27 Mixed from Pictou	12.55
19 Express from Halifax and St. John	13.30
150 Mixed from Pictou	14.25
20 Express from Sydney	14.30
89 Express from Montreal and Halifax	14.40
22 Mixed from Pictou Landing	18.10
77 Mixed from Hopewell	18.45
85 Express from Sydney	20.55
23 Express from Trenton	21.00
17 Express from St. John	21.00

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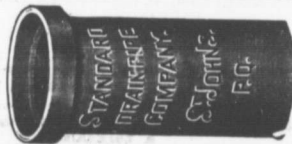
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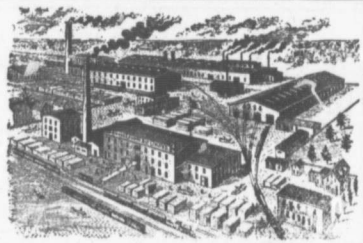
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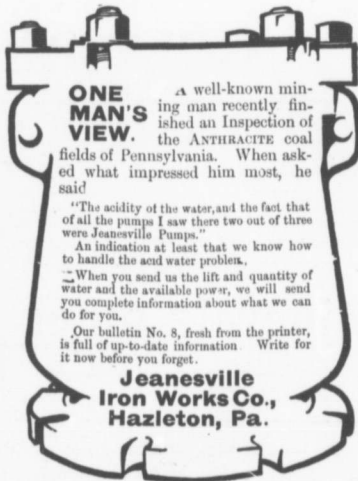
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A well-known mining man recently finished an inspection of the ANTHRACITE coal fields of Pennsylvania. When asked what impressed him most, he said

"The acidity of the water, and the fact that of all the pumps I saw there two out of three were Jeansville Pumps."

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Licenses are issued to quartz mills, which make returns and pay royalty on the gold at the rate of two per cent, on milled Gold, valued at \$19.00 per oz.

Minerals other than
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—LICENSES TO SEARCH—

over five square miles for eighteen months, cost \$30.00; leases for four renewable terms of twenty years each can be selected from them at a cost of \$50.00, and are subject to an annual rental of \$30.00

All titles, transfers, etc., are recorded free of charge by the Department. The royalty on coal is 10 cents per long ton, and on other minerals in proportion.

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The Miners' PUMP.

Having no frictional parts, the Pulsometer
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For Work Underground it is indispensable.

It has no exhaust Steam, needs no foundations and
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E. T. DANIELS and WISE, LONDON, ENGLAND.
also for "UNIVERSAL" and "BRITISH BLENDS," Bull Dog Brand.
Orders from Wholesale and Retail Merchants solicited.

The...
MARITIME MINING RECORD

Vol. 7, No. 19. Stellarton, N. S., April 12th 1905 New Series

EXPLOSIVES AND BLASTING

Presented to the Maritime Mining Students Association by
 J. W. Marshall, Springhill.

(Continued from last issue.)

Quantity of explosives necessary—This will depend on the conditions under which the explosive is used and is a matter of judgement now much is put into the charge. Experience is the only reliable guide and an experienced miner will generally get very near the right thing. The French Commission gives a formula for determining the amount of charge which is as follows:—

Let L = the line of least resistance.
 = $\frac{2}{3}$ length of bore hole in coal.
 = $\frac{1}{2}$ length of bore hole in stone.
 Let Q = quantity of explosive in lbs.
 " E = the coefficient of the explosive used.
 " R = the coefficient of the material to be blasted.

Then $Q = L^2RE$

Two free faces requires $\frac{2}{3}$ of Q

Three free faces requires $\frac{1}{2}$ of Q.

Values of E.

Blasting gelatine	0.14
No. 1 Dynamite	0.20
Tonite	0.245
Roburite, Bellite and similar explosives	0.25
No. 3 Dynamite	0.37
Compressed powder	0.41
Loose powder	0.61

Values of R.

Weak granite and quartzites	0.8 to 1.0
Hard limestones and sandstone	0.5 to 0.8
Coal measure rocks (average)	0.3 to 0.5
Soft shales	0.15 to 0.3
Coal	0.1 to 0.2

The student can work out examples for himself and compare results with his own experiences.

Charging and stemming shots:—In using slow explosives such as gunpowder it is necessary to use some strong and resisting material to stem the shot as the force of the explosive is developed gradually. In using high explosives, which are so much quicker than gunpowder, it is not necessary to use so strong a stemming. However a strong and tight stemming greatly increases the effectiveness of the shot and lessens the danger of flame communication. The latter is proved by the Hebburn experiments already quoted. Clay or small seaggar pickings make good stemming as they are non-inflammable and are soft, but when once rammed home they offer great resistance to the shot. Small coals or coal dust should never be used and are strictly forbidden under the English C. M. R. A.

For the purpose of insulating flame and reducing the heat due to explosion many devices have been brought forward, and used with varying success. Wet sand or

wet moss used for stemming is said to give good results and both are used for that purpose.

Johnson's plug was made of phosphor bronze and it was used by driving it into the shot hole after a slight stemming. Its use was discontinued owing to the plug becoming a very dangerous projectile in case of a blow out shot. Wood plugs have been used but the hole in the centre of the plug which allowed passage for the detonator wires, also allowed the gases to escape, thus lowering the effectiveness of the shot.

Another method of counteracting the heat of explosion is the oxalate cartridge as used in conjunction with Elephant Brand Gunpowder. The cartridge consisted of two thirds of the powder and one third of oxalate of ammonium with a diaphragm between to prevent any admixture. The cartridge was enclosed in a spark proof brown paper wrapper. Elephant Brand in conjunction with the oxalate cartridge used to be on the Permitted List but it has been struck off.

Another invention, brought forward by Messrs Heath and Frost, consisted of a gelatinous cartridge liquified under the heat of the explosion and so reduced the heat.

Of all the safety devices (excepting the Permitted explosives) the water cartridge stands most prominent. It was invented in 1880 by Sir Frederick Abel and improved in 1882 by Miles Settle. When Messrs Nobel were bringing out their new explosive, Gelignite, in 1885 they bought the patent of the water cartridge and both Gelignite and Blasting gelatine were successfully used in connection with it. A favorite test of the firm was to enclose a charge of Gelignite in a water cartridge and put it into a barrel of gunpowder. When the charge was fired the contents of the barrel were scattered but not exploded. The cartridge simply consisted of a paper bag strong enough to hold water. The charge was placed in a metal support which held it in a central position so that it was entirely surrounded by the water. It was tightly tied up at the end and placed in the hole. Then the stemming was done in the ordinary way. The water effectually quenched all flame. Although the cartridge was used a long time and fulfils the requirements of the English C. M. R. A., it is now out of date. The explosive with which it was used has been struck off the Permitted list and very few of the Permitted Explosives could be used in conjunction with water.

Firing the charge—There are three methods of firing the charge. 1st. By means of squibs, straws, or sticks, 2nd. By means of fuses. 3rd. By means of electric light.

1. Squibs consist of a straw or paper quill filled with fine powder. They are inserted after the hole has been stemmed, through the hole left open by the 'picker' or 'needle.' They are generally lighted by means of a match, a piece of 'touch paper' being arranged on one end for that purpose. They are very liable to 'hang fire'

and 'misfire', and are also liable to fire prematurely before the workman can withdraw.

2 Fuses consist of a fine case of powder enclosed in a covering of yarn or tape. To use the fuse one end is inserted in the cartridge and the hole is stemmed. The other end is then lighted and the spark burns slowly to the charge. When 'high' explosives are used the fuse is fixed into a detonator and the detonator is embedded in the charge.

Fuses are liable to 'hang fire' 'misfire' and premature fire, and are also liable to burst and expose flame. Again a naked light, or a hot wire from a safety lamp is often used to light them. Both methods are dangerous in mines giving off CH_4 .

Cickfords Patent Fireproof Colliery Fuse, Safety Lighters, and Nippers have claimed for them that they reduce the last named dangers. The fuse is guaranteed not to expose a flame during combustion and the patent lighter ignites the fuse without exposing flame. The lighter consists of a small metallic tube, closed at one end, and containing a tiny glass bead containing sulphuric acid embedded in a mixture of Chlorate of Potash (KClO_3) and sugar. The fuse is put into the end of the tube and the metal bent tightly round it by means of the nippers. The nippers are then applied on to the spot which marks the position of the bead. As soon as the bead is crushed and the sulphuric acid (H_2SO_4) released, chemical action is set up in the chlorate mixture of sufficient intensity to ignite the fuse.

Another patent lighter is that known as the Norres Patent Safety Fuse Igniter. This consists of a cardboard cylinder, open at one end and with a copper percussion cap at the other end. The fuse is inserted in the open end and the igniter is held in the left hand. A wire passing through the closed end of the cylinder is then given a sharp jerk and a spiral on the end of the wire strikes the cap sufficiently hard to explode it and ignite the fuse.

3 Electricity—This is beyond doubt the best method of firing shots. Its advantages are:—(a) No danger of shots hanging fire. (b) In case of misfire there is no danger in approaching the shot after the battery has been disconnected. (c) All workmen can be withdrawn before the battery is connected to the cable. (d) It is suitable for volley blasting. (e) Detonators (if low tension) can be tested before firing.

Two classes of detonators are used:—High tension and low tension. In high tension detonators the priming composition is interposed in a break in the circuit. The current to pass this break must spark across thus igniting the priming. In low tension detonators the priming composition is placed round a platinum wire which is included in the circuit. The platinum wire resists the passage of the current and thus becomes heated to a white or incandescent heat which fires the priming. Low tension detonators are more liable to go wrong than high tension detonators, but they can be tested before putting them into the charge, which cannot be done with high tension 'caps'. When testing, a number of detonators are coupled up to the cable and a galvanometer is placed in the circuit near the battery on the negative wire. A slight current is then sent through the circuit and a movement of the pointer of the galvanometer will prove that the detonators are all right.

Precautions when firing by electricity—(a) Care should be taken not to damage the wires when stemming the hole. (b) The cable should never be connected to the battery when the men are preparing the shot. All workmen must be withdrawn before connection is made. (c) In case of misfire the cable should be disconnected before any one approaches the shot.

Volley Blasting.—Sometimes a number of shots can be fired simultaneously thus doing more work at once and preventing the frequent withdrawal of the workmen. Bickfords Volley Firer is similar to the ordinary 'firer' but several instantaneous fuses are united in one recipient. Electricity, however, is the best for volley blasting. Two methods are employed:—

1. The series method.—One wire from the first hole is connected to one wire from the second hole, and one wire from the second hole is connected to one wire from the third hole, and so on throughout the series of holes. One wire will be left from the first and last holes and these are connected to the cable completing the circuit.

2. The parallel method.—One wire from each hole is connected to one wire of the cable and the remaining wire from each hole is connected to the remaining wire of the cable.

Detonators.—The outer casing of detonators is generally composed of copper and cylindrical in shape. It contains a priming material and a detonating material. The priming is placed so that the current fires it and then it in turn fires the detonating material which explodes with sufficient force to set off the charge of explosive in the shot hole.

Priming may be a mixture of Chlorate of potash Caprous sulphide and Phosphide of copper, or of Antimony sulphide and chlorate of potash.

The detonating material consists of 80 parts Fulminate of mercury and 20 parts chlorate of potash. Fulminate of mercury is the most violent explosive known and is very sensitive to shocks and blows.

Different explosives require different strengths of detonators according to their sensitiveness to shock. Therefore the detonators are put up in different strengths.

No. 1 detonator contains	4 grains of exp. material.
" 2 "	6.1 " " " "
" 3 "	8.3 " " " "
" 4 "	10 " " " "
" 5 "	12.3 " " " "
" 6 "	15 " " " "
" 6½ "	19 " " " "
" 7 "	23.1 " " " "
" 8 "	30.9 " " " "

Special detonators are also made to suit the requirements of some explosives. A special detonator for firing gunpowder by electricity is now on the market and it is claimed that it increases the effectiveness of safety of gunpowder. There is also a nitro glycerine detonator for use in conjunction with a fuse.

Costs of fuses and detonators (England)

Double taped fuse	\$5.50 per 1000 ft
Firing cables	\$16.00 per 1000 ft.
Nobel's low tension detonators	\$27 to \$32 per 1000
Nobel's high tension standard fuses	\$22 to \$28 per 1000
Nobel's " " " " " " " "	\$27 to \$35 per 1000
Siemens' low tension exploders	\$13 to \$35 each
Siemens' high tension exploders	\$13 to \$35 each
Bickford patent ignitors	\$14 per 1000
Bickford detonators No. 6	\$8.50 per 1000
Norres' patent ignitors	\$12 per 100

The Bickford method is 73 p. c. more costly than the electrical method.

Misfires—In case of misfire when the electricity is used it is safe to go back to the shot after the cable has been disconnected from the battery. On no account should the charge be unrammed. If after an examination of the connections it is found that the fault lies in the charge, or the detonator, a new hole should be bored, not nearer than a foot to the old hole. To prevent the chance of a second hole being bored into the first one

(Concluded on Page 20)

COAL AND ITS CONSORT.

Mr. Drummond in Leg. Council.

At the present time those who have a general concern for the continued prosperity of the Province, and those, more particularly, who believe that future prosperity rests, to a very large degree, on the successful operation of our coal mines and the proper disposal of their product, are more or less exercised over the problem of increased and new markets for our expanding coal production. There are some who look to Ontario, with its consumption of five million tons annually, roughly speaking, as a desirable and likely available market; while there are others who flout the idea that coal can successfully be sent to that province and assert confidently, that the New England States with their annual consumption of twelve million tons of soft coal, should be the objective point of our best efforts, the goal to which we should direct our ambition and our united energies. It is admitted, I presume, on both sides that we cannot at one and the same time secure a large share of both the markets named. If we declare for the Ontario market we must be prepared to forego the American market, and if we declare for the latter it is equal to a declaration for reciprocity—a certain preventive of access to Ontario, and a possible menace to the firm hold we now have over the market in Quebec.

The Coal Companies have been taunted with being apathetic in this matter of extended and new markets. If some, perhaps, of the companies have displayed a seeming indifference to the subject, the same cannot be said of them all. One Company, at least,—I refer to the Dominion Coal Co.—has put forth commendable efforts to secure new markets in heretofore unsought for countries. During the past four years its products have been shipped to the tropics and to points within the Arctic circle, to the torrid and the frigid zones. As proof of this Company's enterprise it may be stated that during the past three years it has shipped an average of 40,000 tons yearly to Norway and Sweden. Possibly it may be interesting to specify some of the cities and the countries to which our coals have been sent by way of experiment, and in the hope of ultimately securing an established trade.

In the course of four years there has been sent to

Stockholm, Sweden and Gottenburg	52,000 tons
Bergen, Norway	13,200 tons
Lulea	4,700 tons
Geffel	4,500 tons
Copenhagen, Denmark	4,400 tons

and in addition there was supplied as bunker, to steamers carrying the coal to these places 10,500 tons. Our coals, it may be well to remark, are of the same class as those generally used in the Northern countries of Europe. It is hoped to develop the trade to Northern Europe by interchange of products. Coal will be sent thither and iron ores for mixing purposes, will be carried back. The Swedish ore carries as high as 70 per cent of iron, and is excellent for mixing with the ore from Belle Isle, when particular grades of pig metal are desired. It is believed that by the employment of steamers of large carrying capacity,

and the procuring of return cargoes, the rates of carriage may be greatly reduced, and thereby a paying market secured in Northern Europe, for at least 100,000 tons yearly of Provincial coal. This prospect certainly may be pleasing from a private Company's standpoint but it may not be looked upon as an unmixed good from the standpoint of the province or the Government. Every thousand tons of ore imported, no matter from where outside the province, constitute an element in regarding the speedy development of the iron ores, declared to exist in rich abundance in the province. That is one way of looking at it and is presented merely in passing.

Some other points to which our coals have been sent are:—

To Genoa, Italy	4,000 tons
Naples, "	4,000 "
Havana, Cuba	9,000 "
St. Lucia, W. I.	3,300 "
Vera Cruz, Mexico	5,000 "
Cape Town, South Africa	3,000 "

The coal sent to Cape Town was for the use of the Railway at E. London, and has given excellent satisfaction. The latest of the experiments in foreign shipments was to Mexico, which was made only last December. I am informed that the prospects of doing trade with that country are far from discouraging. The annual consumption of coal in Mexico is some 2,000,000 tons. The difference, in distance between the American coal shipping ports and those in Cape Breton is certainly greatly in favour of the former, the difference in time being from eighty to ninety hours one way by ordinary steamers, but it is thought that by the employment of a special class of boats, and by economies in other directions, these disadvantages, may to a large extent, be overcome. While it may readily, gratefully be granted that the Dominion Coal Co. has done much to secure new markets, can it be said that the question has at all been taken up by the province at large. The Government of the Province, as we all must admit, should be keenly alive to the progress and to the expansion of the coal trade. Coal constitutes its great source of revenue. Without the revenue from it old bridges could not be kept in proper repair, nor new bridges built. Without it we could not give so large grants to roads, or subsidies to railways, steamers, and ferries. Without it the grant for education would be wholly inadequate for our growing needs, and our noble humane institutions, which ought to be the pride of us all, would have their efficiency sadly impaired. If this that I am saying be true,—and can it well be denied—ought it not, in reason to be supposed that the Government is doing its utmost to secure an expansion of the coal trade by helping to secure new markets, if for the reasons only that its revenue be maintained; and, as surely, expanded. But is it doing this? It is not for me with any emphasis to say no, for I know not what is in the minds of its members, yet, I may be permitted to say that apparently it has not fully awakened to the magnitude of the subject, to the great responsibility of its position. It may be asked: Do you suggest that the Government take a direct hand in the inquiry, in the search after new markets; do you propose that the Gov-

ernment hint to the coal operators that it will give a remission on royalty to all coal sent to new markets? I do not, for such aid, after all, might not be of essential value. I admit that the Government has done all that may be reasonably expected of it for the coal trade directly, while at the same time, without hesitation, I declare that it has not, as yet, to any great extent, begun to appreciate what it is possible for it to do indirectly. No doubt the credit belongs to a liberal Government for having in 1893, given practical demonstration of its desire to aid the coal trade. The legislation of that year has certainly been a potent factor in the impetus given to the trade during the past ten years. The aid was wisely given. The Liberal Government of 1893 was not however, the only Liberal Government which aspired to be patron of progress. In 1872, the then Liberal Government realized that some stimulant was necessary to dispel the lethargy into which the trade had fallen. It is possible, in view of happenings since then, to declare that it loved the coal trade not wisely, but too well, not wisely for the good of the province. Had its plans carried, the treasury of the province might be now in a state of depletion instead of a plethoric condition. It may be interesting to recall what the Government of 1872 purposed to do.

In 1871 it began to be realized that the production of coal was not increasing at a satisfactory rate. The sales that year did not exceed 600,000 tons. In view of the long period during which coal mining had been in operation in N. S. it was considered that so limited a quantity did not show a satisfactory rate of progress. The Government of the day, having at heart the general prosperity of the province, considered it incumbent to offer some inducements to stimulate expansion. This it strove to obtain by offering to grant subsidies, and allow remission of royalties on coals, to any company willing to build railways opening up certain sections of the country. Presumably a preference was given to railways running or that might be run through mineral lands. For instance by an Act passed in 1872 it was resolved that: "A grant of Crown lands in the County of Cumberland, not exceeding ten thousand acres shall be given to the Parrsboro and Springhill Coal and Railway Co., or to any other incorporated company, or to any company that may be incorporated that will engage to construct a railway from Springhill to Parrsboro with suitable appliances at such last named port adapted to a large mineral traffic together with an annual subsidy to such company equal to one half the royalty that shall annually be chargeable under the now existing law on all coal carried over such railway for fifteen years from the completion of the same."

These were liberal terms, but of infinitesimal importance as compared with those to be given to any company that might build a railway from New Glasgow to Louisburg. To such a company was to be given a grant of 150,000 acres of Crown lands, and half the royalty on all coal raised in Cape Breton for a period of forty years. Here we have most assuredly a striking instance of opportunity unregarded. Had the parties who were the incorporators in the Louisburg Extension Ry. Co., been able to peer into the future; had they taken advantage of this, their opportunity, they

would have made themselves and their company rich and famous, and, by an exercise of the right they might have acquired, all but made bankrupt this province. The capitalists of that day, surely, were as short-sighted as the Government was unforseeing and indiscreet. It may be interesting to figure up what the corporators failed to grasp, and what the country gained by this failure to embrace an opportunity. The royalty concessions were to be given from the finishing of the road. Had the road been begun in 1872, it would have been finished in 1876. Let us glance at the quantity of coal sold in Cape Breton from 1877 to 1904, inclusive, twenty-eight years.

From 1877 to 1904 the coal sold in Cape Breton amounted to 32,000,000 tons. This at say 5 cents a ton means a bonus of \$1,600,000. The average yearly increase in shipments for the past forty years has been roughly speaking 10 per cent. Assuming that rate of increase to continue till 1916, the coal sales in that year, from Cape Breton, should reach over 10,000,000 tons. Last year the sales were 3,430,000 tons. Add in each succeeding year 10 per cent, and we find that the sales from 1905 to 1916 give a total of 80,673,000 tons equal to a bonus during these 19 years of \$4,033,650, which added to the bonus from 1877 to 1904 gives a grand total of \$5,633,000. And that is exclusive of the grant of 150,000 acres of lands. By the end of the forty years the company would have received by way of bonuses, two million and a quarter dollars over and above the total cost of construction and equipment of the road calculated at a length of 164 miles at \$20,000 a mile. This year, 1905, the shareholders would be entitled to a dividend of 5 per cent on a capital of \$3,500,000 which dividend would be wholly derivable from the Government bonus of half the royalty. To the present generation it must be intensely gratifying that the capitalists of 1872 were lacking in enterprise and foresight. The knowledge of so great, so fortunate an escape, carries with it the lesson to the Government and to the Legislature not to barter lightly away the people's heritage, not to legislate too far into the future.

The concessions offered in 1872 had for their direct object the stimulating of the exportation of coal, of securing chiefly outside markets. No doubt from coal exported the government and the province derive substantial benefit in shape of increased royalty, increased employment of labour, and the consequent increased circulation of money. But it must not be forgotten that from coal exported the province derives but a fraction of the real value of the product. Besides being a prime necessity, a requisite for domestic purposes, coal is the great and popular motive power. Without it there can be no enlarged industrial activity. The country possessing coal has a tremendous advantage over countries not so highly favoured, over places which possess it not. The foremost nations of the world, those who rule in peace as in war, those that have to be reckoned with, are those having within their border these two products, the basis of industrial progress, coal and iron. The mining of iron ore and its subsequent manufacture into countless articles is essentially a great industry taking, indeed, the foremost place of all after coal, and any inducement that can be made to further the development should be regarded by people of the province generally, and by coal operators particularly, with the greatest favour.

Continued on page 18.

Maritime Mining Record

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STELLARTON N. S.

APRIL 12th, 1905

The shipments of coal for the first quarter of 1905 show a falling off of some 58,000 tons as compared with the same period in 1904, which in its turn was 112,000 tons behind the shipments of the first quarter of 1903. As compared with the shipments for the first quarter of 1903, those for the three months of 1905 show the rather startling decrease of 170,000 tons. For the first three months of 1904 two of the largest companies showed an increase over 1903, but for 1905 each one of the companies shows a decrease when compared with 1904, though in the case of the Nova Scotia Steel & Coal Co. the decrease is only trifling, 235 tons. This company also is the only one whose shipments for 1905 are in excess of the shipments for the first quarter of 1903. The short shipments this year are due wholly to the extreme severity of the weather in Jan. and Feb. The Island collieries will have no difficulty in overcoming the shortage, and indeed increasing their outputs far beyond those of last year, but with some of the mainland collieries, with a fixed daily output which cannot well be increased by spurting, the case is different, and one or two of them may not be able to recover lost ground. The year beginning badly is expected to have a good ending. Everybody seems confident that the shipments for 1905 will beat all previous records. Though the companies are not turning down orders a sufficient number have been closed to keep the collieries fully employed once the season of navigation opens. The companies at the present time are looking forward to a brisk trade.

Mr. F. W. Mason of Halifax writes as follows:—

Mr. Drummond in his remarks before the Legislative Council on the importation of Scotch Anthracite is reported to have said that Welsh Anthracite contained only 80% of carbon. In this he is in error. I give three analyses of Welsh Anthracite, and for the sake of comparison three of Pennsylvanian Anthracite.

	Carbon	Hydrogen	Oxygen	Ash
1 South Wales near Swansea	92.56	3.33	2.53	1.68
2 " " "	90.39	3.28	2.97	1.61
3 Glyncoiring	89.70	3.60	0.42	3.69
4 Pennsylvanian	90.45	2.43	2.45	1.67
5 " "	92.59	2.65	1.61	2.25
6 " "	84.98	2.45	1.15	10.20

The following are the names of the analysts:—
1. Regnault. 2. Vans. 3. Dillner. 4. Regnault. 5 and 6 Percy.

Mr. Drummond may have been mixing up carbon and fixed carbon, but even in fixed carbon Welsh Anthracite generally runs over 88% and the Pennsylvanian little more. Bituminous coals

unless very high in ash rarely run below 75% in carbon and often as high as 85 per cent. I am not aware that Anthracite coal exists in Scotland but it undoubtedly does in Wales and I am of the opinion that an analysis should be made of the article imported, and if not a true Anthracite duty should be charged upon it.

The following is Percy's definition of Anthracite:—Very compact; deep black; bright lustre fracture, uneven or concordial; does not soil the fingers; burns with a feebly luminous smokeless flame; and is much less easily combustible than other kinds of coal; when heated does not in the least degree sinter but frequently decipitates considerably.

(During 1902-03 there was large importation of Welsh Anthracite, so called, into the United States. Duty was imposed on this coal, which could not well have been done had the coal been up to the customs standard for Anthracite, 92% carbon.—Ed. M. R.)

There was three times the quantity of coal sold in Cape Breton in 1904 that was sold in 1894. This is a fair showing. The quantity sold in 1894 was 1,128,000 tons and in 1904 3,430,000 tons, an increase of over 2,300,000 tons in ten years. The mainland cannot show so satisfactory a rate of progress.

Several amendments have been made to the Enginemens bill but none of them of any consequence. Permits hereafter will be granted by the Board of Examiners, or a member thereof, instead of by a deputy Inspector. It is understood that during recess the coal companies will prepare a decent, intelligible and workable act and, present it for consideration at next session.

The Amherst Trades and Labor Council sent a request to the members for Cumberland to introduce a nine hour bill. The council thought that all that was necessary was to send the bill along and it was sure to become law. It is said the P. W. A. wished to have a conference with the Amherst council on this subject but got no reply. If a nine or any other hour bill is to become law all the labor societies must heartily co-operate.

The British American Coal & Railway Co. is the latest concern to become incorporated. The names of Jos. A. Gillies, Sydney; M. E. Gillies of Irish Cove, C. B. Neil J. McDonald Cambridge Mass, Val B. Baggot and Geo. Byale of New York, appear as the incorporators and provisional directors. The capital is a million dollars. Just what they are going to do, or where the company is to operate there is nothing in the act of incorporation to indicate.

The Rand Drill Co. are quite satisfied with the results of the test of the several shearing machines in Cape Breton, although the first order for machines has gone to the makers of the Little Hardy. The Rand Drill Coy's machine did actually more work in the same time than the Little Hardy, but the latter received a preference on account of its less weight. This is the first shearing machine the Rand people have made, had not even a machine on paper six months ago, and the company is confident that in a short time it will be able to turn out a machine meeting all requirements.

AROUND THE COLLIERIES.

Warren Baird has been appointed Inspector in the D. C. C. machine shops at Glace Bay.

John A. McDonald, Overman, Dom. No. 3 went to Hub as Overman on April 1st.—John Nicholson of Hub replaces McDonald at No. 3.

Dr. Cunningham an English Veterinary Surgeon who has looked after the Dom. Coal Co's horses the past winter has tendered his resignation.

Labor seems to be rather more plentiful at the Cape Breton collieries than in former years. It will not be necessary to import men by wholesale.

The Norwalk Compressor Co. have received an order from the Dom. Coal Co. for three compressors to be delivered immediately. One of these is for the Hub colliery.

The RECORD's Dom. No. 2 correspondent says the output of that mine is daily increasing, and hopes are expressed that by May 1st the long talked of 5000 tons a day will be reached.

Mr. A McEachern returned from New Jersey the latter part of March almost wholly restored to health. The New Jersey climate had a wonderfully beneficial effect.

The Dominion Coal Company recently placed an order with Allis-Chalmers-Bullock, Limited, Montreal, for eleven new Ingersoll Coal Cutters. The Company has already 175 of these machines in operation.

Mr. C. J. Coll of the Acadia Coal Co. is in Britain looking over the latest modes of hauling coal from the pits and the screening plants etc., with a view to securing the most modern outfit for the new Allan shafts.

It is not expected that there will be any necessity for double shifting any of the collieries of the Dom. Coal Co. the coming summer. Caledonia and another colliery may work 12 hours daily for some months, as the production is greater than the shaft can hoist in a 9 hour day.

The East slope of Dom. No. 6 has been driven to a distance of over 1000 feet and the second set of levels have been turned off, the first set being at a distance of 500 feet from surface. The north slope is down over 600 feet and a set of levels driven off at about 500 feet.

The Dom. Coal Co. has added 150 new steel cars to its rolling stock. The new cars are the largest in use on any railway in Canada having a capacity of 50 tons, or 5 tons greater than the largest previously in use by the company. These new cars will be able to hold a half days output of all the collieries of the company.

Early last week a man named Reid a stableman at the Acadia colliery was dismissed by Underground Manager Blackwood for some cause or other. The man took his case to the lodge and the result is a strike. The constitutionalists in the P. W. A. say the strike is illegal for several reasons one of which is that there was no reference to Gd. Council. If the man was not discharged for his connection with the Union, or if he was an official, the company has a good case.

The collieries at Broughton, it is said, have a new general manager.

It is likely that shearing machines will shortly be installed in the colliery at Port Morien.

The Gowrie and Blockhouse Collieries Ltd, expect this season to ship 80,000 tons of coal.

Work at the Marsh mine is progressing favorably. There is still plenty of coal in sight.

The Albion mine of the Acadia Coal Co. is doing fairly well these days the output being about 600 tons.

The McGregor, or Tom pit, Albion Mines has started to work once more. There are some ten places working so far.

Mr. B. Archibald of the Engineering staff is superintending the alterations and improvements being effected at Dom No. 3.

Mr. Alex. Dick of the Dom. Coal Co. has been delighting Sydney audiences with sketches of Scandanavia. Mr. Dick has done much travelling and is a quick observer.

Mr. E. Leflamme formerly of the Cumberland Ry. & Coal Co. is now in Maine in the employ of a Contractor who is building 70 miles of road to connect with the Boston & Maine Ry.

If it is correct, as reported in the daily press, that several of the Dominion Coy's collieries will shortly be put on double shift, then the company has changed its intended policy. The desire was a month ago to have no double shift unless an emergency arose.

It is given out that a satisfactory arrangement of the difficulties at Springhill has been arrived at, and a strike thereby averted. The men engaged ribbing pillars will in future receive 75 cents a running yard instead of \$1.00. It is expected that work from this out will be brisk.

A fourth district, Inverness, has been added to those already existing, for the examination of candidates for certificates of competency as mine officials. From this out Inverness will have three men on the Board of Examiners. If all the examiners meet when the papers are being passed upon the Board to the RECORD's fancy will be somewhat unwieldy.

Experiments have of late been conducted at several of the collieries in Cape Breton with three separate shearing machines. The trials have been very satisfactory. It is claimed that honors rest with the "Little Hardy" an English made machine. It is said that ten shearings three feet deep, five feet, or so, in height were effected in two hours. The "Little Hardy" is run with compressed air. It works somewhat after the fashion of a puncher coal cutting machine. The bit has three prongs within a radius of three inches. It is claimed for the machine that it is speedy, easily carried from place to place by two men, its weight being about 250 lbs, and, lastly, cheap, costing only \$250. It is understood a number of the machines have been ordered by the Dom. Coal Co.

Coal Shipments Feb'y-March, 1905.

DOMINION COAL COMPANY, LTD.

—Output and Shipments for February 1905—

—Output—		—Shipments—	
Dominion No. 1	29,094		
Dominion No. 2	24,989		
Dominion No. 3	10,989		
Dominion No. 4	27,752	106,295	
Dominion No. 5	21,571		
Dominion No. 7	3,890		
Dominion No. 9	10,483		
	128,778	106,295	
Shipments Feb'y.	1904	126,221	
Decrease	" 1905	19,926	

—Output and Shipments for March 1905—

—Output—		—Shipments—	
Dominion No. 1	33,277		
Dominion No. 2	42,450		
Dominion No. 3	21,748		
Dominion No. 4	45,081		
Dominion No. 5	46,552	173,595	
Dominion No. 7	8,565		
Dominion No. 8	7,692		
Dominion No. 9	23,400		
	228,765	173,595	
Shipments March	1904	149,427	
Increase	" 1905	24,168	
Shipped to U. S. Feb'y '05		35,447	
" " U. S. March '05		74,259	
Shipments 3 mos.	1904	423,137	
" 3 " 1905		410,539	
Decrease 3 " 1905		12,598	

NOVA SCOTIA STEEL & COAL CO.

MARSH MINE			
Shipments Feb'y.	1904	4,899 tons	
" "	1905	1,623 "	
Decrease	" 1905	3,276 "	
Shipments March	1904	5,244 "	
" "	1905	4,754 "	
Decrease	" 1905	490 "	
SYDNEY MINES.			
Shipments Feb'y.	1904	13,795 ton ^a	
" "	1905	12,480 "	
Decrease	" 1905	1,315 "	
Shipments March	1905	18,547 "	
" "	1905	13,197 "	
Increase	" 1905	5,350 "	
Shipments 3 mos.	1904	62,361 "	
" 3 " 1905		62,120 "	
Decrease 3 " 1905		235 "	

ACADIA COAL CO.

Shipments Feb'y.	1904	21,221 tons
" "	1905	13,566 "
Decrease	" 1905	7,655 "
Shipments March	1904	21,927 "
" "	1905	20,933 "
Decrease	" 1905	994 "
Shipments 3 mos.	1904	61,937 tons
" 3 " 1905		51,510 "
Decrease 3 " 1905		10,427 "

INVERNESS RY. & COAL CO.

Shipments Feb'y.	1904	5,028 tons
" "	1905	2,474 "
Decrease	" 1905	2,554 "
Shipments March	1904	10,320 "
" "	1905	8,992 "
Decrease	" 1905	1,328 "
Shipments 3 mos.	1904	23,975 "
" 3 " 1905		18,192 "
Decrease 3 " 1905		5,783 "

INTERCOLONIAL COAL CO.

Shipments Feb'y.	1904	17,972 tons
" "	1905	4,644 "
Decrease	" 1905	13,328 "
Shipments March	1904	20,292 "
" "	1905	17,874 "
Decrease	" 1905	2,418 "
Shipments 3 mos.	1904	57,432 "
" 3 " 1905		37,846 "
Decrease 3 " 1905		19,586 "

CUMBERLAND RAILWAY & COAL CO.

Shipments Feb'y.	1904	25,467 tons
" "	1905	18,326 "
Decrease	" 1905	7,141 "
Shipments March	1905	37,433 "
" "	1904	31,399 "
Increase	" 1905	6,034 "
Shipments 3 mos.	1904	89,668 "
" 3 " 1905		80,346 "
Decrease 8 " 1905		9,322 "

In the bill to incorporate the Pictou Smelting Co, there was rather a peculiar clause, giving the company power to assess its employees for the purpose of insurance against accident or injury. In the Assembly the clause was altered to read that the company could assess with consent of the workmen and then, only if the company made an equal contribution. The Legislative Council went one better and gave the company the liberty to insure the workmen at the company's expense.

Such inducements should be earnestly sought for by the government, and being found, should be put to immediate use. Inducements should be sought for by the government and by the coal operators, owing to the fact that iron furnaces and foundries are the largest of all consumers of coal. As already suggested, the value of the iron industries to the country cannot be computed from the consumption of coal alone. The money expended in the mining of the coal and in the mining of the ore and its manufacture into finished products is many times turned over. The farmers, general producers, and the carriers of supplies are all benefited and also the workmen in all the trades which are but offshoots of the furnaces and foundries.

Before going into the urgency of the necessity of encouraging iron ore mining, let me point out that neither Great Britain, nor the United States owe much of the rapid expansion of their coal industry to the exports of that article. Their great and growing markets are abroad, but at home. Their furnaces and their foundries, their railways and their workshops, are their great markets. Perhaps it may come as a surprise to some to be told that while the United States in 1904 raised the vast quantity of 380,000,000 short tons of soft coal, only the insignificant quantity of six or seven millions were exported. In other words, of the total quantity raised only 1.5-8 per cent were shipped out of the country, the great remainder of 98.3-8 per cent, being consumed on the premises. This affords proof of the immense quantities of coal that were consumed in iron manufactures and those incidental thereto. By the way, if the exports to Canada be deducted from the exports of the United States then the exports of that country amounted only to less than one half of one per cent of the total quantity raised.

In Great Britain the quantity exported was say 40,000,000 tons, or 15 per cent of the whole. Like the market; the foreign market being barely more than an incident. And that is the position we ought to strive to attain to in Nova Scotia. In the matter of exports to foreign markets in comparison with the United States and Britain, Nova Scotia has nothing to complain of. In 1904 Nova Scotia exported to foreign markets 900,000 tons or 20 per cent, roughly speaking, of the total quantity sold. To some the fact that our exports are relatively large may be comforting; to others the fact may be disquieting, as showing that Nova Scotia is not receiving the full or the true value of her raw product. The full value of coal is only rendered when the coal is employed at home, in the furtherance of manufactures or the promotion of the internal trade of the country. For my own part I am fairly well satisfied with the volume of our export coal trade, but I am far from satisfied at the rate of increase for home consumption, notwithstanding that that increase is. We cannot hope for sources pronounced success which our vast mineral resources entitle us to, until we thoroughly wake up to the fact that the home market is the one, before and hereafter, should be persistently directed. If we have iron ore in large abundance, then there should not be the slightest misgiving as to the future of the Province. But why should it be a far-off future? Why should a true beginning to promote progress, not now be made?

A reason, surely, why there is not a larger home market is because we have not moved rapidly, indeed have not moved at all, in the production of iron ore. And why have we not? Because little attention has been paid to the subject, because we have not tried in a pract-

ical way to demonstrate the vastness, as alleged, of our resources. It has not as yet been made manifest that outside one district, and if far removed from a fuel supply, that we have good ore in good quantity. The production of soft coal in the United States, was as stated, 380,000,000 tons. Of this quantity I give as a guess that 150,000,000 tons were consumed in iron smelting and in the various finishing processes of iron and steel. Possibly 100,000,000 tons were consumed by the railways. Three eighths possibly of the total production of soft coal in the United States went into the making of iron and steel in their various forms. This, certainly, is convincing proof of the desirability of developing our iron ore deposits. I am glad to be able to say that the government seems to be waking up to its immense importance. A deputation from the Mining Society of Nova Scotia waited lately upon the government and expressed the view of the society that some competent expert, a practical man of wide experience, should be brought in to make report on the probable extent of the iron ore deposits. The ready acquiescence given by the premier to the views of the Society gives indication that the government is not oblivious to the great importance of the subject, and is desirous to do something though we have at the present time three iron works in the province, much less ore is being mined than a quarter of a century ago. These iron works are supplied with their raw product from abroad, almost wholly. Indeed during the past two years more iron ore has been imported than has been produced in Nova Scotia since iron ore mining first began. This is certainly a most peculiar and astonishing state of affairs if, as again and again asserted, the province is richly endowed with mineral. If, as one authority has said, there is more ore in the province than there is coal to smelt it with, how comes it that during the past 25 years fifty eight million tons have been mined of coal, and only the beggarly quantity of three quarters of a million tons of iron ore?

In 1840 the production of soft coal in the United States was only 4,000,000 tons; last year it was more than ninety times that quantity. In 1841 the production of coal in Nova Scotia was 148,000 tons, last year it was but thirty times that quantity.

In 1881, Pa., with an area of 45,000 square miles, produced 24,000,000 tons of coal, while in 1902 the production had risen to 98,000,000 tons.

Western Virginia in 1882 produced 2,240,000 tons of coal, and in 1902 24 million tons or eleven fold in twenty years. Nova Scotia, with an area of 20,000 odd square miles, 4,000 less than W. Virginia, produced in 1882 some 1,200,000 tons of coal, and in 1902 3,300,000, or a little over three fold.

Alabama in 1882 produced half less coal than raised that year in Nova Scotia, yet we find that in 1902, her production was not far from three times that of Nova Scotia. Why do I refer to these States and give these figures? In order to point out, what, in my opinion, has been the cause of the phenomenal increase in production in certain of the States of the neighbouring Republic. Why has the United States become in so short a time the foremost coal producer in the world? The short answer is because she has become the foremost producer and the foremost user of iron, steel and their products. When the United States began in earnest the production of iron, then in earnest began the consumption of coal. The lesson seems to be obvious. If Nova Scotia is desirous of coming rapidly to the front, if she be desirous of increasing in population, in wealth,

in influence and enterprise, at a rate commensurate with her magnificent resources, every attention should be paid, and every encouragement given, to the development of the iron ore and the steel industries. As soon as it has been demonstrated that we have vast and rich iron ore deposits, so soon shall we be able to look upon a prospect dazzling almost in its magnificence.

Often these days it is shouted Coal is King. If coal be King, then iron is his Consort, and if in romance the consort of a man or a king is styled his better half, may we not also say of iron, as the consort of coal, that it is its better half. It is admitted on all sides that this Canada of ours is fast making history. May we not be jealous over the part that Nova Scotia is to play in the making of the history.

If our great North-West is to be written of as the granary, if the North is to be spoken of as the emporium of her commerce, may we not seek for Nova Scotia the name of the workshop of Canada.

When the variety of her minerals are counted over, when the possibilities of her coal and iron fields are considered, we may well nigh be overwhelmed with the vastness of our opportunity, and the magnitude of our responsibility. But the greater the responsibility the greater the need of comprehensive and energetic action. If we stand still we will be delinquent of our duty, and unworthy of our ancestry. I can only hope that the Government having put its hand to the plough will not turn back, but that encouraged by the approval of every patriotic Nova Scotian it will push forward until it is known what the future has in store for us as a centre of manufactures of iron and steel.

My argument summed up is that not in securing a market in Ontario: not in an effort to snatch a portion of the market in New England, but in promoting and fostering iron ore mining, and iron and steel manufactures generally, should we bend our best and intelligent energies. There is no market comparable with the home market.

In issue of March 8th. it was stated that when Mr. J. A. Sands returned from London to Chimney Corner he would bring with him a young Welshman as assistant manager. The young man is coming out but not in that capacity. All the miners and the mining officials to be employed at St. Rose will be drawn from Nova Scotia. The St. Rose people are at one with the RECORD in deeming it a mistake to introduce outside men as officials believing that to manage men properly one must understand local conditions.

Mr. Marshall, manager's instructor, has met with a hearty welcome from the Instructors and from the intending candidates in the districts, so far, visited. Mr. Marshall had a field day at Chignecto, Mr. Baird having on an idle day given them the bearings and the freedom of the slope. We are glad to hear that all the students Mr. Marshall has come in contact with are highly pleased with his mode of instruction.

When the shearing machines are introduced in the collieries of the Dom. Copl Co. the centre of the room will be sheared only. This will necessitate two shots. It is claimed that the coal after being sheared and blown in this fashion comes down in a solid piece. The ordinary individual would have thought that blowing a fast side would tend to make a certain amount of slack coal.

The Dom. Coal Co's collieries should be good by May 1st. for about the following outputs daily.

No. 1	2500
" 2	2400
" 3	1600
Caledonia	2200
Reserve	3000
International	1000
Hub	1000
No. 9	1300

15000 or 360,000 tons
per month

Mr. William M. Moran has been appointed Sales Agent of the Allis-Chalmers-Bullock, Limited, Montreal, for the Maritime Provinces with his office at Halifax, N. S. He is a graduate of Washington University, Mechanical Engineering, and during the past fifteen years has been engaged in electrical and railroad work. He has been connected with the Brush Electric Company, the Edison Electric Company and latterly was Chief Engineer for Townsend and Reed, of Chicago, one of the largest railroad contracting firms in the United States.

In 1901 when the men at Springhill asked for a 12 per cent advance, Mr. Cowans the manager asked for and was granted three months to consider the request on the condition that the advance if agreed to was to apply from the date of the request. When Mr. Cowans in February requested the men to concede to a reduction of 12 per cent the lodge asked for three months to consider the proposition. This after much discussion was granted, but whether on the understanding that the reduction if enforced in May should apply from Feb. is not known. Not likely however as the men would hold to what they have as regards wages paid.

Canada is seemingly still an unknown quantity to many people across the line. A member of the American Society of C. E's has issued a book with the title "The story of American coals". It had been well for his reputation had he omitted all reference to Canada, as he evidently is in utter ignorance of her affairs. Here is the one reference he makes to Canadian coals and it is a corker and no mistake:—

"Canada is devoid of any traces of the coal measures, and presents a remarkable contrast to the regions by which it is surrounded. Newfoundland, New Brunswick, and Nova Scotia contain the north easterly extension of the great American fields. But as far as yet known the coal measures are more interesting to the geologist than to the economist."

In the absence of the editor a number of recently issued catalogues were received; all full of interesting information and which may be had free on application. These catalogues are issued by the Canada Foundry Co., Allis-Chalmers Co., Sullivan Machinery Co., Canada Rand Drill Co., and Jeffrey Mfg. Co., whose respective addresses may be found in our advertising columns.

If the government dredge is put to work early in Mabou harbor, the Mabou Coal Co. will enter the list of provincial coal shippers this year. The Record trusts that the dredge may be set to work as soon as the ice is broken up.

and exploding the charge it is best to make a chalk mark on the roof when boring the first hole so that its direction is shown when the next one has to be started. The two wires from the detonator of the missed shot should be tied to a prop by a piece of string so that if the second shot does not explode the first the detonator may be found by that means. If the missed shot is not exploded care must be taken to search for it after the second one is fired and if it cannot be found the stuff that the search can be continued on the surface. Serious consequences have been known to result through unreported, unexploded charges being loaded away and sent to tank

When a squib or a fuse is used and the shot does not go off it is not safe to approach the hole until a considerable time has elapsed. Shots have been known to 'hang fire' and then go off after standing nearly twenty-four hours, which shows the risk attached to going back too soon. Many miners are reckless enough to go back almost immediately, but the great number of accidents due to this practice ought to be sufficient warning against it. The place where the misfire occurred ought to be fenced off and allowed to stand twenty-four hours. The remarks with regard to boring a new hole, finding the first charge if it does not explode when the second shot is fired, and other precautions mentioned also apply in this case.

In some cases where a high explosive is used with only a short stemming, it may be practicable to put the second charge into the same hole and stem it without touching the original stemming. The detonating of the second charge would then be nearly certain to set off the first one. All cases of misfire should be reported to the management and the cause stated in the report. However, in case of a detonator, it should be taken out of the mine before trying to discover the reason of its not exploding, i. e. if it is recovered.

Blown out shots—The force of an explosive is always exerted along the line of least resistance, that is to say the material is always broken down at its weakest point. Should the stemming be the weakest point the stemming material together with the flame and gases from the explosive are ejected from the shot hole in the same way as the charge is ejected from a cannon. The danger of such an occurrence cannot be too much enlarged upon especially in mines which give off CH_4 , or which are dry and dusty. The Hebburn tests already described show that even with the so called 'Safety' explosives an explosion can be caused in this way when CH_4 is present, and Mr. Henry Hall's experiments with coal dust proved that dry coal dust alone could be ignited by a blown out shot and cause an explosion. The most recent and most disastrous explosions which have occurred in England have been traced directly to blown out shots and air-way close to the shaft bottom and where it was impossible for gas to be present owing to a large volume of air at a high velocity traversing the airway. The following shows the experiments carried out by the

Prussian Fire-damp Commission in an experimental gallery built of masonry and 180 ft. long.

In pure air a blown out shot travelled	9 ft.
With 3 p. c CH_4 a " " " "	30 ft.
With 7 p. c. CH_4 a " " " "	125 ft.
If air was dusty a " " " "	180 ft.

wholesale length of gallery.

A blown out shot may be caused by:—
 1 Careless placing of the shot hole. 2 Making the shot hole deeper than the 'mining' or 'kiring'. 3 Careless, or inefficient stemming. 4 Blasting in the solid. 5 Too small a charge of explosive. 6 Too large a charge of explosive.

Prevention lies in avoiding the causes named and every precaution should be exercised to prevent so dangerous an occurrence.

The following are some general precautions to be observed in order to prevent accidents from shot-firing in course of "paper")

1 Carefully comply with the requirements of the C. M. R. A.

2 In mines giving off CH_4 use no other explosive than a 'Safety' explosive.

3 When using a 'Safety' explosive always remember that the danger is only lessened and not abolished, therefore do not run risks by firing them amongst gas or unwatered coal dust.

4 Use only explosives, fuses, or detonators made by a reliable firm so as to be sure of having the best material.

5 Examine for gas immediately on returning to the seat of the shot, also examine the roof and sides and pull down any loose stone or coal.

6 If any timber has been knocked out by the shot, have it replaced at once.

7 If a shot is likely to 'hole' into the next place see that there are no workmen there and that it is clear of gas.

8 In using 'high' explosives always use the proper detonators.

9 Appoint only careful and reliable workmen to superintend shot firing operations, the shotfirer to do the charging, stemming, and lighting himself except it be a non-flery mine where the men fire their own shots.

As will be learned from the announcement in their regular space in the Record, the fire which occurred in the B. Greening works did not cause any interruption to the business of the Company. The Company's many customers will be glad to learn of this.

J. Inglis & Co. of Toronto have secured the contract for the new pumping engine for the Stelarton water works, being \$200 below the estimate of the Canada Foundry Co. It is claimed that the engine to be erected is the first of its kind in the lower provinces.

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HIGH GRADE WIRE ROPES FOR
 Hoisting, Haulage, and Colliery Purposes.
 Manufactured by
Dominion Wire Rope Co., Ltd., MONTREAL.
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SYNONYMIC FOR SUPERIORITY,

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COMPLETE MINE EQUIPMENT.

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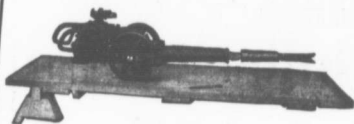
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Largest Cutting capacity.

Lowest repair costs.

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of these Boilers in use in the United States and Foreign Countries. Made entirely of wrought steel. Employ no tube-caps or gaskets. Four man-holes give access to the entire interior, exposing every rivet, tube and joint in the boilers. Can be cleaned in ONE-FOURTH the time required by other types.

The Stirling Superheater Boiler, a combined water-tube boiler and superheater in one, for all degrees superheat from 50 to 250 degrees Fahr. The only commercially practical superheater for high degrees of superheat.

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and other
Steel Castings for

MINING PURPOSES.

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(Under the patents of Saxby & Farmer, Limited, of London Eng)

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STEEL CASTING
FORGINGS,
SPRINGS,
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CROSSINGS,



Synopsis of Regulations for disposal of Minerals on Dominion Lands in Manitoba, the Northwest Territories and the Yukon Territory.

Coal—Coal lands may be purchased at \$10 per acre for soft coal and \$20 for anthracite. Not more than 320 acres can be acquired by one individual or company. Royalty at the rate of ten cents per ton of 2000 pounds shall be collected on the gross output.

Quartz—Persons of eighteen years and over and joint stock companies holding free miner's certificates may obtain entry for a mining location. A free miner's certificate is granted for one or more years, not exceeding five, upon payment in advance of \$7.50 per annum for an individual, and from \$50 to \$100 per annum for a company, according to capital.

A free miner, having discovered mineral in a place, may locate a claim 1500 x 1500 feet by marking out the same by two legal posts, bearing location notices, one at each end on the line of the lode or vein.

The claim shall be recorded within fifteen days if located within ten miles of a mining recorder's office, one additional day allowed for every additional ten miles or fraction. The fee for recording a claim is \$5.

At least \$100 must be expended on the claim each year or paid to the mining recorder in lieu thereof. When \$500 has been expended or paid, the locator may, upon having a survey made, and upon complying with other requirements, purchase the land at \$1 an acre.

Permission may be granted by the Minister of the Interior to locate claims containing iron and mica, also copper in the Yukon Territory, of an area not exceeding 160 acres.

The patent for a mining location shall provide for the payment of Royalty of 2-1/2 per cent of the sales of the products of the location. **Placer Mining**—Manitoba and the N. W. T., excepting the Yukon Territory.—Placer mining claims generally are 100 feet square; entry fee, \$5, renewable yearly. On the North Saskatchewan River claims are either bar or bench, the former being 100 feet long and extending between high and low water mark. The latter includes bar diggings, but extends back to the base of the hill or bank, but not exceeding 1000 feet. Where steam power is used, claims 200 feet wide may be obtained.

Dredging in the rivers of Manitoba and the N. W. T., excepting the Yukon Territory.—A free miner may obtain only two of five leases of five miles each for a term of twenty years, renewable in the discretion of the Minister of the Interior.

The lessee shall have a dredge in operation within one season from the date of the lease for each five miles, but where a person or company has obtained more than one lease one dredge for each five miles or fraction is sufficient. Rental, \$10 per annum for each mile of river leased. Royalty at the rate of two and a half per cent collected on the output after it exceeds \$10,000.

Dredging in the Yukon Territory—Six leases of five miles each may be granted to a free miner for a term of twenty years, also renewable.

The lessee's right is confined to the submerged bed or base in the river below low water mark, that boundary to be fixed by its position on the 1st day of August in the year of the date of the lease.

The lessee shall have one dredge in operation within two years from the date of the lease, and one dredge for each five miles within six years from date. Rental, \$100 per mile for first year and \$10 per mile for each subsequent year. Royalty same as placer mining.

Placer Mining in the Yukon—Creek, gulch, river and hill claims shall not exceed 250 feet in length, measured on the base line or general direction of the creek or gulch, the width being from 1000 to 3000 feet. All other placer claims shall be 250 square feet.

Claims are marked by two legal posts, one at each end, bearing notices. Entry must be obtained within ten days, if the claim is within ten miles of mining recorder's office. One extra day allowed for each additional ten miles or fraction.

The person or company staking a claim must hold a free miner's certificate. The discoverer of a new mine is entitled to a claim of 1,000 feet in length, and the party consist of two, 1,500 feet altogether, on the output of which no royalty shall be charged, the rest of the party ordinary claims only.

Entry fee \$10. Royalty at the rate of two and one half per cent on the value the gold shipped from the Yukon Territory to be paid to the Comptroller.

No free miner shall receive a grant of more than one mining claim on each separate river, creek or gulch, but the same miner may hold any number of claims by purchase, and free miners may work their claims in partnership by filing notice and paying fee of \$2. A claim may be abandoned, and another obtained on the same creek, gulch or river, by giving notice and paying a fee.

Work must be done on a claim each year of 100 acres for each period, or the certificate that work has been done must be obtained each year. If not the claim shall be deemed to be abandoned, and open to occupation and entry as a new mine.

The boundaries of a claim may be defined absolutely by having a survey in and publishing notices in the Yukon Office. Gazette.

Petroleum—All unappropriated Dominion Lands in Manitoba, the Northwest Territories and within the Yukon Territory, are open to prospecting for petroleum, and the Minister may reserve for an individual or company having machinery on the land to be prospected an area of 1000 acres for each period, or he may decide, the length of which shall not exceed three times the breadth. Should the prospector find oil in paying quantities and satisfactorily establish such discovery, an area not exceeding 640 acres, including the oil well, will be sold to the prospector at the rate of \$1 an acre, and the remainder of the tract reserved, namely, 1,280 acres, will be sold at the rate of \$3 an acre, subject to royalty at such rate as may be specified by Order in Council.

W. W. CORY

Dept. Interior,

Deputy of the Minister of the Interior

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Successor to Sinclair and Patterson—

Steam boilers are, of course, used for the conversion of water into steam by the application of heat usually obtained from coal. The operation of converting water into steam is known as evaporation, and some steam boilers can generate a larger volume of steam than others by the burning of a given weight of coal. This is what we mean by the evaporative power of a boiler, which may vary from six pounds of steam to twelve pounds of steam from the consumption of one pound of coal. It is not easy to determine the evaporative power accurately, because it is not easy to prevent water passing out of the boiler along with the steam, however, careful experiments specially conducted by engineers who understand the why and the wherefore have arrived at very correct results as regards different boilers and also as regards different fuels.

CONDENSING IN PUMPING.

Provided that the pump is sufficiently large in proportion to the steam cylinder to provide ample water for condensation, say not less than 30 or 40 pounds of water for each pound of steam, we have found that the exhaust steam from the cylinder of a pumping engine can be turned into the suction pipes of the pump. The result is that the exhaust steam becomes part of the suction water, and the only effect upon the suction water is that it is somewhat higher in temperature than it would otherwise be. This does not matter, because a pump with proper metal valves will deal with water just as well at a temperature of 90 or 100 degrees as it will with water at a temperature of 60 or 70 degrees. The efficiency of the pump as to delivery is diminished by the amount of steam condensed.

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No 32	No 34	Miles	STATIONS	No 31	No 33
L 10 07	L 3 55	0	Pt Tupper Jct	A 9 55	A 3 35
10 15	4 00	1 3	P Hanksbury	A 9 50	3 27
A 10 32	A 4 10	4 7	Port Hastings	L 9 37	L 3 19
L 4 27	L 4 15	8 8	Troy	F 9 06	F 9 06
F 4 40	F 4 27	12 7	Craigmore	F 8 51	F 8 51
F 4 52	F 4 39	16 9	Judique	F 8 34	F 8 34
F 5 07	F 4 52	23 1	Catherines Pond	F 8 21	F 8 21
F 5 20	F 5 07	27 6	Port Hood	A 8 00	A 8 00
A 5 35	A 5 20	32 5	Glencoe	F 7 45	F 7 45
L 5 45	L 5 32	37 2	Mabou	F 7 15	F 7 15
A 6 00	A 5 45	44 5	Glendyre	F 6 50	F 6 50
A 6 21	A 6 06	44 5	Black River	F 6 37	F 6 37
L 6 23	L 6 08	47 4	Strathloose	L 6 20	L 6 20
F 6 35	F 6 20	52 2	Inverness		
F 7 00	F 6 45	52 2			
F 7 12	F 6 57	56 6			
A 7 25	A 7 10	60 9			

Trains make close connections at Pt. Tupper Jc with all I C R passenger trains excepting the Maritime Express which leaves Point Tupper at 8.40 pm

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Especial care is taken in preparing our coal for Domestic Uses. For Stoves, Grates and Ranges, it has no superior in Cape Breton or Nova Scotia.

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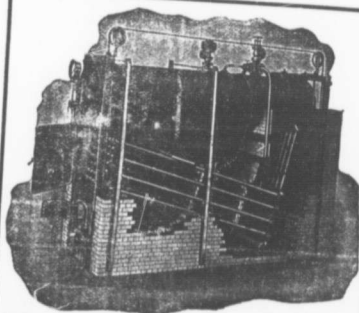
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Danger of FIRE

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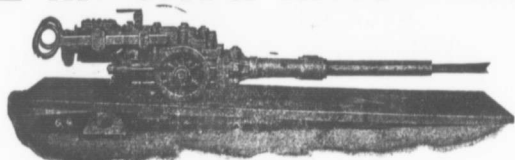
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*Best all round flour on the market.
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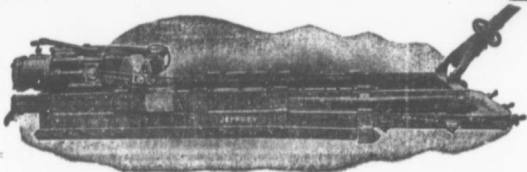
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Equal in quality to Scotch Clay. Sold in bulk or in bags
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The Reputation of this Coal has Steadily Advanced during the past 40 years and the Output of the new Mine is fully up to the old Standard of Excellence.

Especially designed Piers for the rapid delivery of coal into Vessels by Roe and Bedlington's Patents.

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Engines, Boilers, Machinery,
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Bituminous Coals, the celebrated "Reserve" coal for household use, "International" Gas coal, and the best Steam coal from its collieries on the Phalen seam.

—Yearly output 3,500,000 tons.—

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ANALYSES OF GAS AND STEAM COAL MADE BY J. & H. S. PATTINSON, CHEMISTS,
—NEWCASTLE, ENGLAND.—

	STEAM COAL.	GAS COAL.
CARBON.....	80 18 per. cent.	77 51 per. cent.
HYDROGEN.....	5 11 " "	5 22 " "
OXYGEN.....	7 34 " "	6 72 " "
NITROGEN.....	1 16 " "	1 27 " "
SULPHUR.....	0 56 " "	3 07 " "
ASH.....	2 30 " "	4 10 " "
WATER.....	3 35 " "	2 11 " "
	100 00	100 00

Calorific Power of Steam Coal :—Pounds of Water evaporated from 212 per cent Fah, by one pound of the coal as determined in Thompson's Calorimeter, —14.8 lbs.

Shipping facilities at Sydney, and Louisburg, G. B., of most modern type. Steamers carrying
—5000 tons loaded in 24 hours.—

Special attention given to quick loading of sailing vessels. Small vessels loaded with
✎ quickest despatch. ✎

:: BUNKER COAL ::

The Dominion Coal Co. has provided unsurpassed facilities for Bunkering Ocean going Steamers with Dispatch. Special attention given to Prompt loading. Steamers of any Size are bunkered without detention.

By Improved screening appliances lump coal for Domestic trade is supplied of superior quality.

Prices. Terms, etc. may be obtained at the Offices of the Company.

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RAILWAY AND

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OPERATING THREE
THICK SEAMS
NOS 1, 2 AND 3.

—Miners and Shippers of the Well Known—

FRESH MINED SPRINGHILL COAL

... ANALYSIS ...

	NO 1	NO 2	NO 3
Moisture.....	2.02 %	1.41 %	2.71 %
Volatile combustible matter 18.94 %	27.93 %	28.41 %	
Fixed Carbon.	75.29 %	67.47 %	64.69 %
Ash.....	3.75 %	3.19 %	41.9 %
	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
Sulphur.....	1.15 %	58 %	.79 %

BEST COAL FOR
LOCOMOTIVE USE.

Delivered By Rail or Water

BEST COAL FOR
GENERAL STEAM PURPOSES.

The year Round

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IN Lots To Suit Purchasers.

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