MARITIME MINING RECORD

COAL AND METAL TRADE JOURNAL

Cumberland. ✳ *Pictou.* ✳ *Cape Breton.* ✳ *Inverness*

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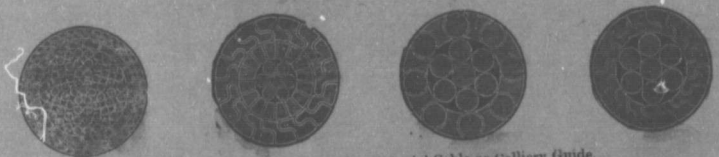

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	28 Mixed for Pictou	11.15
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	18 Express from New Glasgow	7.35
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	23 Mixed from New Glasgow	10.45
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	19 Express from Halifax and St John	11.00
	139 Mixed from Pictou	15.15
	85 Express from Halifax and St. John	16.40
	20 Express from Sydney	15.20
	22 Mixed from Pictou Landing	18.10
	77 Mixed from Hopewell	18.45
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FOR INFORMATION APPLY TO—

CHRISTOPHER CHISHOLM

Commissioner of Public Works and Mines, HALIFAX, N S.

The....
MARITIME MINING RECORD

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SELECTED QUESTIONS AND ANSWERS.

Q—In a mine giving off a large quantity of fire-damp, how would you ascertain if the mine was properly ventilated ?

A—Speaking practically, it is impossible to ascertain if a mine is properly ventilated, except by actual inspection, and that with regularity.

In making the daily inspections great care should be taken to see that the air current was taking its proper course. It should be seen that all doors, brattices, and regulators are properly arranged, because, should there be any defect in these causing the air current to be deranged, that particular part of the mine would soon become charged with gas—that is, in a mine as the one in question—and if such an occurrence took place great care would have to be taken in restoring the ventilating current to its proper course, or the return air would become highly charged with gas and be in a very dangerous state.

During each inspection the air should be tested several times, and in such places where gas was likely to accumulate. To my mind where a gas 'cap' showed upon a safety lamp during the inspection that part of the mine would not be properly ventilated, because it would be in a dangeous condition.

It is a well known fact that when less than 2 1-2 per cent of gas is present in the air it will not show itself on the flame of a good safety lamp; it is also known that on an average fiery mines are dusty, and 1 per cent of fire damp present in the air in the presence of coal dust is very dangerous.

General Rule 1 of the Coal Mines Regulation Act of 1887 states that an adequate amount of ventilation shall be constantly produced in every mine to dilute and render harmless noxious gases to such an extent that the working places of the shafts, etc., shall be in a fit state for working and passing therein.

From this rule it can be seen that the ventilation must be such that it will sufficiently dilute the gases as they are given off from the strata.

Not only must the current carry the gases away, but it must render them harmless, and it could not be said that any atmosphere which showed a gas 'cap' upon a safety lamp was harmless, because, as I have stated, fiery mines as a rule are dusty, and 1 per cent of gas present in the air under such conditions is dangerous, whereas 2 1-2 per cent of gas has to be present before it can be detected in a safety lamp.

In such a mine the main return air should be tested regularly, as also should the edges of the gob in rise workings, and if a 'cap' showed on the flame of a safety lamp I would consider the ventilation inefficient.

SHOT-FIRING.

Q—What are the causes of blown out shots?

A—Explosives are used in mines for breaking down coal, ripping, and for driving stone.

If the persons engaged in shot-firing were good practical men I see no reason why the occurrence of a blown out shot should not be very rare.

Blown out shots are known to be a great source of danger, owing to the large amount of flame and the highly heated gases being projected from the shot hole with a great amount of force and velocity. This flame is liable to ignite any small amount of gas which may be present, or is also liable to ignite any small amount of coal dust which may happen to be suspended, in the air in the vicinity of the shot, There are several causes of blown out shots.

1—Careless workmen, drilling and tamping the holes with bad judgement.

2—Care not always taken to proportion the charge according to the work to be done; in other words, the whole is overcharged, the effect of this being almost the same as a blown out shot.

3—Insufficient tamping may also cause a blown out shot, or careless tamping through not being rammed tight enough; the stemming does not offer as much resistance as the mineral, the result being that the stemming is blown or forced out.

4—Unskilful placing of the explosive by the length of the drill hole exceeding that of the under, thus placing the shot in the solid.

To prevent blown out shots I would:—

See that the hole was properly drilled and cleaned, and of just sufficient size to hold the cartridge.

2—See that the whole was in proper position, depth not exceeding the undercut, and, if possible, pointing upwards, because every explosive, I believe, has a tendency to rise when fired.

3—Carefully stem the hole with clay the surface, or dampened unclay, which has been drilled from the hole.

EXPLOSIVES

State what you know about the use of high explosives, and state why it is absolutely necessary that they should be used in mines. Give the composition and peculiarity of three of the high explosives.

A—Until quite recently, as the history of the great industry goes, the only explosive agent that was used in our coal mines was common gun powder, fired by means of a 'squib' or 'kitty' ignited either by the candle or by unscrewing the vessel from a safety lamp, or sometimes by means of a red hot wire, which had been

heated by pushing through the gauze apparatus of the safety lamp.

The number of explosions annually caused by shot-firing grew to such an alarming extent as mining operations were extended, that it received the attention of some of the ablest of our experts, who set about the manufacture of an explosive that would, if properly used and handled, afford the miner a comparative degree of safety.

The matter also received careful attention by our legislators, with the result that the laws and bye-laws relating to explosives and their mode of application in a mine were made much more stringent.

The result has so far been, to some degree at least, satisfactory, for the number of accidents from this cause has been greatly reduced; yet, we think it is considerably larger than it ought to be, and it is the writers opinion that even with the least safe of our explosives, the risk of explosion by shot-firing would be reduced to a minimum if shot-firers and those engaged along with them would discontinue some of the dangerous practices and pay stricter attention to the carrying out of the C. M. R. A.

The result of all the time and attention devoted to the explosive agents for coal mines has been to place upon the market a large number of explosives of different kinds, varying in strength and the safety with which they may be used in mines.

Each of these explosives falls short of the ideal of a safe explosive ; the ideal explosive for use in mines would be 'flameless', whereas each one of these that is in use up to the present, will, under certain conditions, develop more or less flame.

What are known as high explosives are those that are exploded by detonators, and are so called flameless and there is no doubt that if properly used the amount of flame produced is reduced to a minimum, and for this reason high explosives are absolutely essential for mines where blasting is imperative.

The Committee which was recently appointed by the Secretary of State to enquire and report on the safety or otherwise of Bobbinite and other explosives of a like nature, divided the many explosives into five groups, as follows:—

1—Nitro glycerine compounds.
2—Ammonium Nitrate Explosives.
3—Nitro-glycerine and Ammonium Nitrate Explos.
4—Non-detonating Mechanical Mixtures
5—Gunpowder.

The first mentioned three are known as high explosives or "detonants" and for our purpose here we will give the composition and characteristics of one in each of these three classes.

Nitro Glycerine Compound: Carbonite :—This explosive is placed on the permitted list and is extensively used, being found very suitable for blasting in coal and in the shales and metals of a softer nature.

Composition:—In every 100 parts by weight :—

Not more than 27 and not less 25 parts of Nitro Glycerine. Not more than 36 and not less than 30 parts of Nitrate of Barium and Nitrate of Potassium, or either of them.

Not more than 37 and not less than 34 parts of woodmeal.

Not more than 5 and not less than 4 parts of moisture with or without 1-2 part of Sulphuretted Benzol.

Not more than 1-2 part of Carbonate of Sodium and Carbonate of Calcium, or either of them.

Ammonium-Nitrate Explosive: Ammonite—
Composition—87.5 per cent Ammonium Nitrate,
12.5 per cent Dinitro Naphthalene.

Ammonium Nitrate and Nitro-Glycerine Explosive: Excellite;—This explosive, along with others of the same group, has been designed with the express object of combining the safe properties of the Nitrate Ammonium group, along with the free detonating powers of the Nitro Glycerine group. They will detonate in a fairly free manner, even when the Nitro-Glycerine becomes frozen. The chief drawback so far experienced has been the providing of suitable water proof cartridges.

Ingredients	Parts by Weight. Not more than	Not less than.
Nitro-Glycerine	9	7
Nitrate of Ammonium	84	80
Collodion Cotton	1.5	0.5
Di-Nitro-tolnol	3.5	2.5
Woodmeal (dried at 100° C.)	4.5	3.5
Castor Oil	1.5	0.5
Moisture	2.0	0

Q.—Can high explosions prevent accidents ; If not why ?

Itis safe to say that, so long as shot-firers, and in some instances higher officials also, are guilty of many dangerous practices, in defiance of rigid laws and regulations, so long shall we have disasters associated with explosives.

Of course we are aware that high explosives are only comparitively safe, but there does not exist the slighest doubt in the writer's mind that by using one of these high explosives in the proper manner and refusing to fire shots unless all the conditions of the C.M. Act and Explosives Order are carried into effect, the risk of accident could be reduced to a minimum

That reckless practices are in vogue is an accepted fact to all those who are intimately acquainted with a mine where blasting operations are largely practiced. I have myself seen many of them at one or two collieries, and it is no exaggeration to say that one does not wonder at accidents happening but rather one is apt to be surprised that they are not more frequent.

To give one or two instances that I can personally vouch for ; I was at one time engaged at a large colliery where a large amount of blasting was done, both in coal and stone, and one night two men were sent to blow some floor up in a heading, just underneath where a large fall had taken place a few days previously. In the interests of safety the fall place had been 'covered in' by means of wood bars with one layer of covering wood over them , the distance from the bars to the roof being about 10 feet. To blow up the floor the workmen put in two holes. In due course the shot firer arrived, and stemmed the two holes, examined the place for gas and fired the two shots one after another. At the time he fired these two holes, if he had just raised one piece of this 'covering' wood over the bars and inserted his lamp, it would have been immediately extinguished, practically the whole area of fall place above the timber being full of CH_4. I personally directed the shot firers attention to it the following night but he was astonished that I should request him to remove the said gas before firing any more holes in that place.

It is only fair to him to say that the man was so over-burdened with work that it was impossible for him to get through it, and, at the same time, take the precautions that were absolutely necessary, and in so far as that was so, the higher officials were in a sense responsible for this and other dangerous practices that were an every day occurrence in that particular mine.

Again; At the same colliery the writer has seen workmen engaged in blowing bottom up, and the floor has been a trifle wet; in order to prevent mis shots, owing to water penetrating to the cartridges, whilst the workman has been engaged in stemming the hole the shot firer has been 'running' his cable out, and whilst the workman has 'coupled' up at the shot the shot firer has 'coupled' up at the battery. Immediately on so doing the workman has jumped up and run for his life, shouting at the same time 'fire', and the shot firer has fired with the man running as hard as possible—in some instances the material from the shot flying after him—the whole operation being done in as hurried a mahner as possible in order to get the shot 'off' before water got to the cartridges and caused a mis fire.

Owing to such like practices as the last named, the writer has always been in favor of a permitted explosive having a water tight cartridge, more especially in seams where there was the least likelihood of water being present near the shot hole.

Further, I am aware of one or two collieries in my own personal experience where it is a matter of everyday occurrence for contractors to un-ram shots that have missed fire, rather than be at the trouble to put in a relieving hole.

Seeing that such like practices as hrre mentioned are continually being put into effect, I say that it is not altogether the use of explosives, but the absurb abvse of them that constitutes the largest element of danger in the matter of firing with high explosives.

GEOLOGY.

Q.—What is (1) carbonaceous shale; (2) arenaceous shale; (3) argillaceous shale; (4) sandstone?

A.—Carbonaceous shale, in conjunction with all other classes of shale, is simply consolidated mud or clay which has been altered by time and pressure. The mud in this case at the time of its depotition was to some extent mixed with vegetable matter, which, upon consolidation, carbonises the mineral matter, and any woody fibre which may be present. In many parts of the country this class of mineral is called oil shale. Some oil shales are very rich in mineral matter, containing in some cases as much as from 80 to 90 per cent., and very seldom more than 20 per cent. of volatile matter. These shales are found in several formations in the earth's crust, and yield, when distilled, burning and lubricating oils, paraffin wax, (which is used for candle making purposes) and ammonia in such quantities as to make the shale industry—in this instance—a profitable one.

Arnaceous Shale.—This is so called because of its sandy or sand bearing nature. The base of the shale is mud into which is deposited, either by the agency of water, wind or other means, sand; it may be only a small quantity, or it may be of such a large quantity that the mud is only present in very small proportions. In fact, there are numerous classes, from the one containing only a small amount of sand, up to those which are chiefly composed of sand, and so closely resmbles sandstones that they may be and are very frequently called sandstones even by students who are fairly well versed in geology. These rocks are generally laid down by water, and their gradation is caused according to the conditions prevailing at the time of their formation. If the sand is in abundance the rocks formed are of a hard nature, but if the sand be only present in small quantities then the resultant rocks are of a soft nature, and if placed into water mud would be the result in a short space of time.

Argillaceous shale also belongs to the sedimentary group, but differs in nature from the other classes of shale, being composed of mud and clay. Clay, when in a pure state, is silicate of alimunium, and is said to be derived in the first instance from the decay of felspar in the igneous rocks. Argillaceous shales are deposits of mud and clay which, upon consolidation, from rocks of a comparitively soft nature. These rocks are laminated, and have special properties, according to the various amounts of foreign matter which may be deposited in the rock with the mud and clay. For instance, if sand be present in large quantities fireclay is the result; little sand and a large proportion of water forms fuller's earth; and clay containing calcareous matter (lime) is called marl. These will do to show what a variety of rocks there are under this heading. Shales are generally of a dark colour, and are laminated or deposited in thin layers or beds which may be more or less easily seperated from each other according to their various admixtures. If shales of any description be broken up and mixed with water, mud is formed in a quick and easy manner. These rocks frequently contain fossils of the marine type.

Sandstone.—Briefly, this is a rock composed of agglutinated particles of sand. It may be said to be a species of freestone, which has had its particles united or jointed together by means of heat and pressure, There are numerous varieties of sand-stone. Thus, ordinary sand becomes sandstone. Another class is called grit, consisting of sand, pebbles, rounded or partly rounded particles of rock etc. The cementing material, or the agent which restrains and holds together the numerous particles of these rocks, in some instances gives the rock special characteristics. For instance, if carbonate of lime be the agent; it a small portion of the rock be placed into an acid the rock—or, rather the carbonate of lime—will effervesce, and fall to pieces; this is called calcareous sandstone. If the agent is a compound of iron, their colour will be changed according to the nature of the agent, either yellow, red, or chocolate coloured sandstones will be the result according to the nature of the agent; these are called ferruginous or iron-like sandstones. Another class of sandstone is the micaceous or flaggy sandstone, which bears mica in more or less large quantities. It may be scattered in a regular manner throughout the whole of the rock, causing the rock to be easily split up into flags, or it may form in layers according to circumstances at the time of the formation of the rock. Sandstones as a general rule are composed maihly of silica, a very hard material, but there is some other agent in their compositiou of calcareous or iron ferruginous natures. These lime and iron admixtures impart or give to the rocks special characteristics according to their composition and adundance, Sometimes the rocks are extremely soft, but at others they are of a very hard,

flinty nature. Their colour also varies greatly from a greyish white to red, yellow, chocolate, and all shades in between these colours, and each class of rock has to be analysed before its true composition can be accurately ascertained.

ACCIDENTS IN SHAFTS.

Mr. H. S. Witty, manager of the Cadby Main Colliery, led off with a warm eulogy of the winders, who, he maintained, were efficient and careful in the exercise of their vocation. First of all, the speaker drew attention to a recent fatality caused by over-winding at the Holemswood Colliery, though this did not actually take place in the shaft. The manager (Mr. Limb), who lost his life, was walking down the gantry. At the moment a cotter pin flew out, affecting the reversing gear of the engine, and the engineer discovering it impossible to to shut off steam, appl ed the brake, but too late, the drum making seven or eight additional revolutions, resulting in the chair being carried up with a great speed to the safety clutch. The rope was released, but the heavy cage falling some 12 feet, broke two D links of 1¼ ld. iron, one of which was slung some distance, striking Mr. Limb on the head. This was an unusual incident, and at that inquiry Mr. H. Stokes, Inspector, commended the winders of the district. Ten lives were lost, it would be remembered, at Houghton Main, on December 32st, 1886, through overwinding. Mr. Witty also referred to a disaster occurring at Main Colliery, Burton on-Trent, in November last, when through some reason the engines failed, and the drum made one revolution too many. In this case there was no steam brake, and the engineer lost control. Sixteen men descending at the time were severely injured, and the ascending cage was held by a King's hook. The Whitmore gear was the safest to prevent overwinding. Continuing, Mr. Witty referred, amongst other disasters, to the one at the Parkgate No. 2 Shaft, Aldwark Main, February 23rd, 1905, when, through a rope breaking some six yards below the surface, the cage fell 380 yards, as a result of which seven were killed and one permanently injured, This was a steel rope 3½ in. in circumference, the breaking strain of which was 56 tons, and the Inspector, Mr. Pickering, held that the accident was due to two causes, happening together, neither of which singly, would have been sufficient to have caused the disaster, First, that the rope was weakened to one-third of its original strength by wear and internal corrosion, and, secondly, the engineer must have retarded the motion of the cage by applying the brake or reversing too violently. Experiments by Professor Thompson, of the Leeds University, were being made to ascertain the moment of force due to inertia at the commencement and during retardation of the winding, but the necessary apparatus was yet incomplete. Mr. Witty considered it necessary that the rope should be recapped at least once from three to six months. They would then have an opportunity of properly testing, and, if necessary, changing the position of the rope at the pully where it received the greatest strain. Very rarely had accidents been proved to be brought about by neglect of the winders or banksmen. The best way was to secure appliances which would prevent any mistake on the part of the winder. At Wath, Main, in December last, the connection between the rope and the cage broke, and the ascending cage, which was loaded, returned to the pit bottom, blocking the shaft for the rest of the day. A week previous the executive of the Derbyshire Miners' Association had drawn the attention of H. M. Inspector of Mines to the subject of carefully overhauling the winding gear in consequence of the recent accidents at Barnsley and at Leicestershire.

The speaker said in this respect automatic cut-off and reversing gear should be attached to the indicator mechanism, and this should be periodically tested. Proceeding, he spoke upon patent catches, wooden guides, and steel wire rope guides. In dealing with the recent Barrow colliery disaster, he said, by some misunderstanding, a flat sheet used as a gantry was lowered on to the cage by a sub-hanger-on unknown to the chargeman at the other deep, who signalled the cage away, with the result that the flat sheet, catching the cage floor and holding it, slightly tilted the chair, causing it to oscilliate the wire girder. Seven men were thrown out. Here were 500 yards of wire-rope guides, which, when oscilliated, projected, the wave upward and downward causing violent vibration. In this instance there were no gate-ends to the cage so some of the occupants were precipitated to their doom.

It should not be thought from this that all ropes were unsafe. There was danger in the wearing away of parts of the wire guides. When a strand was worn severely a passing of the cage shoe might cause it to break, with consequent ruffling up into a bunch. A remarkable accident was caused in this manner in 1889 at Aldwarke, when three persons were thrown out of the cage owing to a loose strand of wire, and lost their lives. The general impression was that steel rail guides were the safest for heavy loads and quick winding from deep shafts.

Students in the near fcture would have to study this, added Mr. Witty, as the deep Barnsley seam would be worked ere long. Continning, he dealt with the systems of signalling, sinking and changing of shafts, scaffolding, and shaft ffres. One of their chief dangers wrs due to the very fine particles of coal taken into the shaft by the air current. This dust, by sudden compression, might raise the temperature and assist the pent-up force behind to increase the devastation in the event of an explosion. They now had a dust collector, which drew the particles to a centre by a system of air pipes, which would mitigate considerably this danger.

SAFETY IN BLASTING

—

A consular report from Nottingham, England, speaks of a new method of blasting in mines, whtch is claimed to reduce the liability of accidents by ensuring the firing of every charge. It is claimed that fully one-half of the present coal-mining accidents may be prevented by the introduction of this method.

While the invention is particularly applicable to mines and quarries, it may be used in all kinds of blasting. It is thus described: The end of a tube with a loose central needle is inserted into a cartridge of explosive material, and the cartridge with the tube and needle are placed in the prepared shot hole. The hole is then rammed, after which the neeedle is withdrawn from the tube, and the detonator, attcched to a suitable carrier, is then passed through the tube into the space left in the explosive by the withdrawal of the needle.

The detonator is coupled to the battery and fired; but if from any cause the explosive is not fired, or the detonator misses fire, it can be withdrawn and another detonator attached to the carrier and placed to the explosive as in the first case.

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R. DRUMMOND, PUBLISHER.

STELLARTON. N. S. FEB 26.

COAL IN ANTIGONISH.

Some weeks ago no little stir was caused in coal minlng circles by the announcement that large tracts land in Antigonish County had been covered by of rights of search for coal. Report had it that coal had been discovered, and that all indications pointed to several seams of commercial value. Whether any steps have been taken to prove the value of the alleged discovery we cannot say. If coal of commercial value has been or is likely to be discovered, then the Record will rejoice with every patrictic Nova Scotian. Some of us, on the announcement of the reported discovery, did not lose our heads, nor did our feet go from under us. We had heard of discoveries of coal in Antigonish long ago, which evidently did not promise well as nothing came out of them. "Coal in Antigonish" is by no means a modern legend The discovery of pieces of coal on the North River of Antigonish was mentioned three quarters of a century ago. Gisner in 1836 drew attention to these findings. Previous to 1836 several pits were sunk at Peter Dion's, where the dip is N 24 W 20. This coal was underlain by clay full of stigmeria. The coal seen in pieces on the shore is in part bright and good, but in part very pyritous. The Geological Report for 1886 says;

"No seams of workable coal appear to have been fonnd on the peninsula north of Antigonish, the black shales there exposed having apparently been mistaken for coal, into which they pass at several points; but from many of the openings not a trace of good coal has been obtained."

In How's Minerology of Nova Scotia the shale or coal in Antigonish is thus referred to by Mr. Campbell,

"The fact that the centre of the Antigonish basin is occupied by highly bituminous limestone, overlaying the oil coal and oil shale beds, may possibly indicate that the whole group is upper Devonian or lower Carboniferous rocks which are not known in this country to contain enal beds of any value."

In the Report of the Commissioner of Mines for 1868 a return is made of an expenditure of $682 for exploratory work in driving a tunnel for the purpose of cutting the seam of coal. There were other expenditures. The encountering of faults seems to have had the effect of dispiriting the exploitors.

Mr. John Campbell's explorations showed "that these oil coals and shales underlie the Carboniferous limestone at Big Marsh; he divided these into two groups, the lower seventy or eighty feet in thickness, including twenty seet of good oil shale. five feet of which are curly cannel, rich in oil; the upper, 150 feet thick, in immediate contact wsth the limestone, containing a large percentage of oil. The pits dug in search of coal in and about Big Marsh are shown on the map. The black shales are associated with light-grey micaeous shale and sandstone, full of fmpressions of broken plants.

In the course of a search for coal at Hallowell Grant in 1888, Mr. Alex. McBean, the well-known explorer of Pictou coalfields, found "a thickness of 150 feet of black shale, containing twenty feet of curly cannel, mentioned by Campbell and a little coal. is underlaid by a great thickness of greenish shale, underlaid in turn by coarse sandstone and soft conglomerate. Mr. McBean supposes that there are several bands of this shale arranged in the form of a basin which underlie the limestone of Big Marsh post office, aad is perhaps broken on the north side by a fault. The west end of this basin seems to be at the fork of the old Gulf road, and the east end at the fork of a large brook two miles west of the post office. It does not seem to pass more than half a mile northwest of the Big Marsh road, or half a mile southeast of McGillivray's road,until it is underlaid by the coarse sandstone and conglomrrate. Dunlop's pits are northeast of the post office. A long tunnel is in the brook, half a mile east of the post office; it is driven 150 feet in black shale, cutting at the end a seam from which coal is said to have been taken. At a very small brook west of the long tunnel, the limestone overlies grey and reddish conglomerate. Up the west branch of this brook is the best coal seam in the district, said to be five feet thick and to dip to the westward, but to be broken off both east and west of the brook. A considerable quantity of coal was extracted from it. The dark shales are nearly all curly and polished; the masses of coal are lenticular or crushed. In most cases it is a hard bituminous variety, somewhat shaly, streaked with pyrite, but in places it resembles cannel."

The workings on the little brook at a little distance from the Big Marsh post office give pieces of coal which analyzed as follows: Three samples. Vol matter 21 per cent. to 28 per cent; Carbon 30 to 47 per cent., and ash from 26 to 46 per cent. The sample quoting 46 of ash represented the whole thickness of the exposure. Perhaps perserverance may yet have its reward.

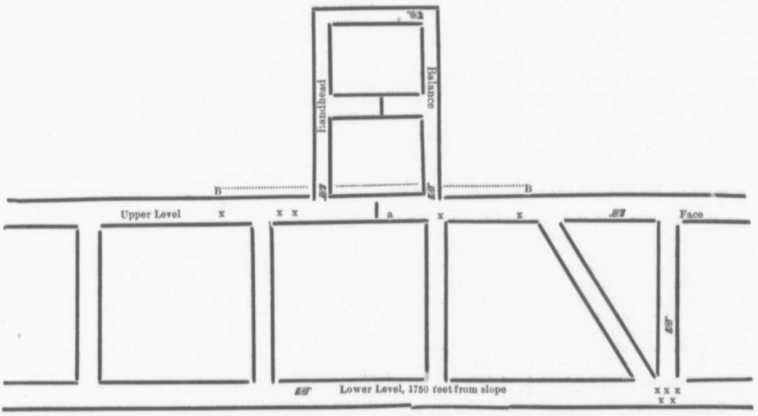
THE PORT HOOD DISASTER.

Any one conversant with coal mining and who read the evidence given at the coroner's inquest must surely come to the conclusion that Deputy Inspector Nicholson had good grounds for being indignant at the verdict returned by the jury. The verdict is, in effect, that the accident was caused by the firing of some explosive. In every day mining language an explosive is something used in the winning of the coal, and outsiders might come to the conclusion that the jury meant that the accident might have been caused by blasting powder. There is nothing whatever in the evidence to show that powder played any, let alone an important part. Any miner who has witnessed a powder explosion and an explosion of gas will promptly declare that there is an awful difference in their respective action. The damage done by an explosion of powder is, in nine cases out of ten, purely local; that from an explosion of gas is as a rule far reaching.

Gunpowder exploded would not have carried the bodies of the workmen along the level against the air and down the head or slant connecting the higher and the lower levels. It would have

smashed the bodies against the roof or the side of the face of the level, and instead of following in to the face would have flamed out with the current. On the other hand an explosion of gas is wholly in its element in madly rushing against the air, the element which gave it strength and vehemence. The evidence went to show that the brattice meant to prevent the air which came up the head from the lower level from rushing in an unbroken current slopewards was either down or in so defective a condition as to enable the air to proceed outwards without making a circuit by way of the balance and back head. This balance had not been examined for two or three days. On previous examinations gas had been found in it. A reasonable conclusion, from the evidence, is that gas had accumulated in the balance, and backhead, and that one of the workmen had in some way set off the gas near the foot of the balance or back head. Our opinion is that the gas went off at the foot of the back-head, and, if the sketch below giving the position of the bodies, when found, is correct, the force of the explosion was sufficient to send two bodies slopewards, The other men were working inside of the bottom of the bankhead and as the fire passed the bottom of the balance it procured more fuel and gained force carrying the bodies onward, two of them along the level a considerable distance.

The explosion seems to have spent its force near the foot of the head connecting the levels, and by which ventilation was carried to the upper level. We incline to the opinion that the levels were free of gas and from the limited damage done, that only so much of the gas in the balance as had become diluted exploded. The sketch given below is rough and is not drawn to scale, but is accurate enough to give an idea of the seat and extent of the explosion. We agree thoroughly with Inspector Nicholson in believing some one had greviously blundered. Indeed more than one must have been guilt of gross incapacity or negligence. The law was being flagrantly violated. The examiner is supposed to write a report daily ; in this instance no such report was written by him. We are greatly disappointed in the actions of many of the "Men's Examining Boards." Though these Boards were organized at their own suggestion and for their own protection, we are forced to the opinion that in far too many cases, certificates are granted in a slip shod manner. Those who recommend and appoint examiners, not likely faithfully to perform their duty, cannot escape their share of the resbonsibility when accidents arise through the incompetence or carelessness of the examiners or of those who they have without proper investigation declared qualified.



The hands point the direction of the air current.
a is where the brattice should have been, but was down.
The crosses show about the position in which the dead bodies were found.
The dotted line, B B, on upper level shows where the men were working, or were to go to work that morning, in making a turn out. All the men were employed within say 100 feet of each other, or between B and B.

Note—Later information places 4 bodies only at the bottom of the slant, and two between bottom of balance and slant.

Rubs by Rambler.

No, you could not knock it out of his head with a sledge hammer—the idea that labor and labor alone is the source of all wealth. You may point out to him his error, but he would not be a Socialist if hedid not tell you you were wholly in error, while he preached the real gospel. The Herald has a staff correspondent who, in a series of letters, is trying to show the workingmen that if they wish to be emancipated they must set up and elect candidates from among themselves. Now, it is very easy indeed for any one to assert that capitalists are tyrants and workingmen half serfs, but when proofs or details are demanded they are not forthcoming. Will the Herald or any other paper, tell us, in simple language, what the workingmen want, in the way of legislation, that they cannot secure unless they wield the balance of power in the legislature. Some one may say they want higher wages; well these will scarcely be secured by legislation; Shorter hours; Well, yes, they might effect that reform, but the workingmen themselves are not a unit on that point. If an eight hour day means ten hours per day pay, they may hold up their hands, to a man, for it, but if a shorter day means shorter pay, they are not so eager for it. If workingmen were in power, or held the balance, they would bring about public ownership. Well, did it never strike the Socialist, or the ordinary common sense workingmen. that if public ownership was considered a good, wise, and profitable thing, it would have been in vogue before this. Those most to be benefited by public ownership of water works, gas plants, tramways, telephones, telegraphs, etc., etc., are not the workingmen chiefly, but the middle classes, who are the chief users of railways, &c., and the largest consumers of gas or electricity. Public ownership is a big question. The city of Glasgow owns its trams; it is just being found out that public ownership is not an unmixed good. Cheap fares for long distances were established in the hope that the artizan class would leave the city slums, and look for habitations in the suburbs, Instead of that the better class took advantage of the low fares to reside in the country, thereby depriving the city of a large amount of taxes. By degrees the workingmen is coming into his own, and he will arrive at his goal as quickly by commonsense means as by revolutionary tactics.

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I heard a representative workman say the other day to the president of a big coal Co., "It is a pity you did not think of asking your men to meet you; if you could address them in the same way as you have done now, and given them similar information, I think the atmosphere would be much clearer." The idea of the head man having a heart-to-heart talk with his employees, could only result in very many cases in a better understanding between them By way of illustration let me cite what occurred in Pittsburgh two or three weeks ago:—

"In the banquet hall of the Union Club, the ultra-exclusive social organication of Pittsburg, founded by H. C. Frick and frequented by none except men who can write checks for millions. John H. Jones, president of the Pittsburg-Buffalo Coal Company, gave a dinner to the men employed in his mines. There were 150 of them, 100 of whom were coal diggers. The others were pit bosses, fire bosses, foremen and superintendents. In addition all of the officers of the Pittsburg-Buffalo Company, a $10,000,000 concern, attended. The miners came dressed in their Sunday clothes, smoking their pipes as they entered, and preferring them at the close of the banquet to the costly cigars that went with the dinner. They did not appear embarrassed, and they made speeches and good ones too.

"The dinner was given by Mr. Jones that he might have a heart-to-heart talk with his men. Some time ago a law was passed by the Pennsylvania Legislature providing that only smokeless powder must be used in the mines after Feb. 1. Because smokeless powder makes no flash it is less dangerous, and it is believed that it will reduce the number of mine disasters fully 60 per cent. The miner has to furnish his own powder, and smokeless powder costs a few cents more than common black powder. There have been mutterings against the new order, and in several instances the miners have threatened to strike if the law is enforced.

"This was the principal topic discussed at the banquet. At first the miners could see only that the powder was to cost them a few cents more a pound.

"This law is going to be enforced," declared Mr. Jones, in an impassioned speech. "You men have got to look further than the end of your noses. We don't want to kill you in these mine horrors, and you've got to help us to protect you. Some of the miners have declared that they will strike rather than use smokeless powder. But they won't. I think you have too much sense to oppose anything that is being done for your own good.'

"And the miners, smoking their pipes, yelled their approval. Many of them were called on by Mr. Jones to make speeches, and they talked just as they do at their conventions, with good, common sense arguments, and here and there, with rhetoric that astounded the millionaire members of the club, many of whom were in the galleries."

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I was told the other day that a mining paper should confine itself chiefly, no, it was wholly, to mining subjects. In proof that I do not hold any such belief or subscribe to such a dogma, I proceed:—I hope the Rev. Mr. Donaldson, before he stops lecturing on Socialism, will tell us exactly what the ruling spirits in the Socialist camp aim at. The teachings of the Church are not those of any individual member, but of the duly constituted authority. Similarly to arrive at what Socialism really aims at, he must not listen to the individual, but to the enunciations of conference or International Congress. He must knock at the door of the head centre. If Mr. Donaldson goes there he may find that Socialism is not the milk and water diet he thinks it is. It is no mild mixture. Mr. Donaldson's idea is that Socialism means co-operation, equality, and re-

cognition of labor. If that be Socialism, who can fault it. But that is not Socialism as defined by the schools, by its most active propagandists. If these were its main points they would cause nary a ripple, for they are as old as Pliny or any other ancient philosopher. Mr. Donaldson seems to think that Robert Burns, were he living at this time, would be an ardent Socialist. He makes his deduction from Burns' famous song, "A man's a man for a' that." I hold that the song instead of leading one to think that Burns would be a member of the International Order of Socialists, would be anything but that. The song teaches honesty, manliness, independence, as opposed to slavishness and selfishness Indeed, he sings as if poverty were in the natural order of things, but poverty not to be ashamed of. Burns did not call upon the workingman to keep up a whine; he asked them, though poor, to be manly, to be honest. He believed in thrift, a thing the Socialist spurns. He believed from the sole of his foot to the crown of his head that there was nothing better for squaring the shoulders of a man than a belief in himself, and a provision of his own for his needs. He did not believe in the "equality" of the Socialists, which means equality in things material. Burns believed in the individual acquiring wealth; the Socialist does not. Never was Burns more sincere than in his Epistle to a young friend. To him he says:

To catch dame fortune's golden smile
Assiduous wait upon her,
And gather gear by every wile
That's justified by honor.

Not for the purpose of hoarding or lording it over others. No.

"Not for to hide it in a hedge,
Nor for a train attendant,
But for the GLORIOUS privilege
Of being independent."

Independent of what? Of lordly assumptions as of the parochial authorities; of the frowns or favors of plutocrats, as of the pity of the prosperous, or the patronage of the pampered. Burns was not envious, as is the red shirted Socialist. If he was poor he placed the fault where it should lie:

"Had I to guid advice but harkit
I might by this have led a markit,
Or strutted in a bank—or clarkit,
My bank account.

He was no collectirist, but a firm believer in individuality. He rather inclined to the idea that the will made the way:—

"With steady aim some fortune chase,
Keen hope does every sinew brace,
Through fair, through foul they wage the race,
And seize the prey.
Then cannie in some cozie place
They close the day.

I trust, too, that Mr. Donaldson will tell us why the one talent man came in for such a trouncing. The poor fellow was a socialist. Why did he fail? He had the opportunity. Was he lazy? I rather think so, for a fair rendering of the sentence passed on him is "Take him away, the lazy, good for nothing rascal; he doesn't believe in exertion; he is likely one of those who think the state owes him a living." And we have men of the same stripe to-day, and they do not blush to acknowledge it.

A SENSIBLE DELIVERANCE.

Commenting on the report of the Conciliation Board appointed to enquire into matters in dispute between the G. T. R. and their telegraphers, the Ottawa Citizen has the following readable remarks:—"One of the most logical and convincing deliverances of a practical character on the relations of capital and labor is contained in the report of the board of investigation under the Lemieux act in connection with the dispute between the Grand Trunk Railway and its telegraph operators. It is the joint product of Professor Shortt, an authority on economics, Mr. Donoghue, a gentleman who has the thorough confidence of trades unionists throughout Canada, and ex-Judge Nesbitt. It points out that hundreds of millions of dollars of the capital stock of the company, pays no dividend at present, and if the operating expenses of the road should be unduly increased it might be necessary to reduce the dividend on the preferred stock. Capitalists cannot be expected to grant the use of their money without a fair return, and they are just as entitled to it as the wage earner is to a fair day's pay for a fair day's work. Moreover, if the company cannot earn a fair return on capital, it is placed in a position which makes it difficult to secure further money for expansion. The inability to secure such money reacts upon the wage earner, who will be deprived of the work which would be provided by the expenditure of this capital. It also reacts upon the public, which is constantly requiring better service from the railways, both on existing lines and by the construction of branches to serve districts which have not the necessary railway facilities,

It necessarily follows that, with wage earners demanding a larger share from the receipts, and the public demanding larger expenditures on capital account, there must be a limit to the borrowing powers of the corporations, unless the receipts are sufficient to furnish a fair return to the investors of capital. These are facts which cannot be too strongly placed before an intelligent public at the present time. While the gross receipts of many corporations, and especially railways, are constantly increasing, the operating expenses show a tendency to increase in a greater ratio. There can be only one result should this trend of affairs continue. While the wage earners are endeavoring to secure what they may consider a fair share of the existing prosperity, they must be careful not to kill the goose that lays the golden egg. When the operating expenses becomes so high that the capitalist gets no fair return from the money invested, the situation will soon react on the wage earner. Operating expenses will have to be cut down, which means that many wage earners will be thrown out of employment; while the inability of capitalists to secure dividends will prevent companies obtaining capital for purposes of expansion, thereby reducing the available work for still other wage earners. As the position set forth in the report finds a parallel in many other lines of business, it will repay the careful consideration of organized labor, so that there may be an amicable re-adjustment of relations which will afford fair play to both sides.

AROUND THE COLLIERIES.

Those who are promoting the St. Rose Coal and Ry. scheme, are as confident as ever of a satisfactory outcome. Tight money is the reason matters have not been further advanced.

The Old Age Pension Commission Report did not reach the King's printer until the 14th, of the month; was out of the hands of the binders on the 22nd. A rather smart piece of work, as the Report makes a 'Blue' book of 134 pages.

The conference of the New South Wales Labor delegates, held last month, rejected by 118 votes to 27 the familiar resolutior in favor of collective ownership of the means of production distributiog and exchange. "Common sense prevails," shouted a number of hard-headed delegates.

The tangle, which for the past two years, has interfered with the proper development of the Mabou mines has all been straightened out, and from this time forward bnsiness will be carried forward in a business way. The sinking of the slope will be proceeded with rapidly, three shifts being employed. During the summer shipping will be vigorously prosecuted, and before next fall connection will likely be made with the Inverness Ry. & Coal Co.

The government, in an effort to arrive at some fair equitable and safe method of determining the size of the pillars te be left in submarine areas, will appoint a commission to fnlly investigate the subject. This action is most timely. Though mathematicians tells us their calculations based on information supplied by the geological department, that we have in N. S. five or more thousand million tons of coal on the land areas, a sufficient quantity to serve for an indefinite period, it is a fact, patent to those familiar with our mines, that large swathes are being yearly cut in the land areas, and the ground depleted of coal is assuming large proportions. The fact is that big as the quantity may be on the land areas, the future of coal mining in Cape Breton and Inverness Counties lies in the submarine areas. At present one law applies to the entire submarine field. In all cases certain thicknesses of pillars must be left under a certain number of feet of cover. This is a wasteful system, for a mine with only ninety feet of cover, that is ninety feet of strata between it and the waters of the ocean, may be far less liable to flooding than some other mine with 200 feet of cover. It very much depends on the nature of the strata. It will be the duty of the commission to find out the nature of the strata in the several districts, and supply information which will enable the Mines Dep't to determine the necessary thickness of strata and of pillars to render working safe, and yet avoid unscientific waste.

The story of a stick of dynamite being found in some coal about to be shovelled into a fire under a boiler at Moncton needs further explanation than the one given, namely, that it must nave been loaded with the coal at some of the mines. In the stick of dynamite, too, was found a cap. Had it been a cartridge of flameless or some other kind of powder than ordinary black, the story might be accepted as true, but so far as we know at none of the mines is dynamite used in the blasting of coal.

The Westville Free Lance refers in fitting terms to the fact that Rodk. McDougall has filled the position of cashier for the Intercolonial Coal Co. for the long period of forty years. The Record endorses the sentiments of the Free Lance. The writer has known Mr. McDougall for very many years, and can bear testimony to his diligence and faithfulness. He has seen many changes in his days, as he was with the company during the nigh score years in which dividends were even less frequent than angels' visits, and with the company in the latter years when the hearts of the shareholders were made glad with moderate dividends.

It is thought by some that the Coal Mines Commission, asked for by Dr. Knndall, may be granted. The granting of a commission, however, may not be any assurance that all the knowledge that the Doctor is after will be forthcoming. So far as the information sought for is for the safety of the mine or the men, or of the coal trade generally, it may be cheerfuily given, while the information which would gratify only an idle curiosity, may not so easily be drawn out. If, for instance, the cost of getting coal is too rigidly inquired into, the effect may be to make capital shy of investing in coal ventures.

The accident at Sydney Mines a fortnight ago by which Underground Managers Stewart and Dorsey lost their lives by "overwinding," is one of the saddest that has occurred in the annals of mining in Nova Scotia. The accident was not due to carelesness on the part of anyone, but to a really competent man becoming confused by the signals, and hoisting the cage on the bank when the signals applied to the cage at the bottom. Both men were held in high esteem, and the peculiar sadness of the event evoked the greatest sympathy. A full investigation took place as to the cause of the failure of the "hook,' brake, etc., and no doubt the recommendations will be carried so far as practicable.

APPLIANCES FOR RESCUE WORK.

At an informal meeting of the members of the North Staffordshire Institute of Mining and Mechanical Engineers, the President (Mr. G. P Hyslop) in the chair, Professor Leonard Hill, F. R. S., M. D., delivered a lecture on the latest appliances for rescue work in mines, and illustrated his discourse by demonstrations with various types of apparatus. In the first place, he explained that in dealing with any form of breathing apparatus for rescue work, certain requirements must be satisfied. The apparatus must give one a supply of oxygen such as would last at least two hours—a time which would allow of efficient work being carried out—and that supply must be sufficient, not for a man in a resting state, but doing the hardest work. In rest a man required something like 0-3 of a litre of oxygen per minute, but in the hardest work such as hill climbing, he might use almost two litres per minute. The apparatus must, therefore, allow a supply of two litres of oxygen per minute for two hours. Then the apparatus must have an efficient absorber for the carbonic acid gas given off, and the absorber must keep the percentage of that gas below the amount which was injurious. It was exceedingly dangerous for the percentage of oxygen to fall off much. Normally, it was 21 per cent. in the atmosphere, and in the apparatus it ought never to fall below 12 per cent. At 10 per cent. there was risk, and at 7 per cent. there was very great risk. The dangers of want of oxygen were very insidious, and lack of it might cause loss of consciousness without any warning at all. It was, therefore of the greatest danger to have an apparatus so contrived that the oxygen might fall below 12 per cent., and it was of the greatest importance that the man should have warning when the supply of gas was falling off. Then, as to the amount of carbonic acid gas which constituted a danger, he remarked that in a badly ventilated room the percentage did not rise above 0-5 per cent., which did not have any injurious effect at all. If, however, carbon dioxide was present to the extent of 3 per cent., it produced some panting and increased depth of respiration. If it rose to 7 per cent. it produced unpleasant increased depth of respiration. When it was present to the extent of 10 per cent. there was extraordinary panting, and the whole effort was given up to breathing. With 15 per cent. of carbonic acid one might become stupefied and rendered unconscious. Nevertheless one might live many hours in 15 or 20 per cent. without being poisoned. So far as the apparatus was concerned, they should never allow the atmosphere of the breathing bag to rise above 3 per cent., because that amount began to produce troublesome excessive breathing, though it would not do a man any harm. As a matter of fact, it was better to keep it down to about 1 per cent., and then there would be no increased breathing worth talking about. The amount of oxygen, however, was a more important thing than excess of carbonic acid, so long as it did not exceed 3 per cent. Then, the breathing dress must be provided with a breathing bag which would allow sufficient air for each breath. It must be ample to allow one to fill one's lungs at each breath. Then, there must not be a large dead space, such as a considerable space in a mask would provide, because that would tend to increase the volume of carbonic acid inhaled. Further, the apparatus ought to be as light as possible, and it ought to be so arranged as to incommode a man as little as possible. It should be well disposed about the body. It was most important to well hang the weight, and that was a matter that had been worked out by the German physiologists, in connection with the army, in finding out how to distribute the weight a soldier had to carry about his body. The breathing dress, unfortunately, could not be a light thing, and it was naturally not easy to arrange this apparatus in a light form. The lightest dress on the market was that known as the "Pneumatogen." Dr. Hill described the apparatus, and remarked that the supply was quite good under certain conditions. If a man was resting or walking in a quiet way, it would last him one hour, and he could walk a mile and a quarter with it. As long as he was quietly walking it was all right, but supposing he tried to walk quickly, the apparatus could not keep time with it. It was only meant for emergency work, and for use for a short space of time. Professor Hill then described the "Drager" and the "Shamrock" apparatus, afterwards proceeding to explain the principles of the "Aerolith" liquid air apparatus and also that of the "Weg." Finally, he explained the construction and working of the "Fleuss," upon which the lecturer had himself effected improvements. The equipment was made, he said, of canvas and leather in one piece, so that the wearer could pick it up and put it over his head. All he then had to do was to put the mouthpiece in, apply the nose-piece, and turn on the oxygen. There were two oxygen cylinders, carried at the back, and a reducing valve, giving a steady supply of 2 litres per minute for two hours. There was an emergency valve and a pressure guage carried in front. The caustic potash used for absorbing the carbonic acid gas, was carried loose at the bottom of the breathing bag, instead of in cartridges. As a consequence, every movement shook the bag and shook the sticks of potash together, with the result that the carbonated surface was rubbed off, and the carbon dioxide was the more readily absorbed. It weighed just over 30 lbs., the oxygen supply was sufficient, and the carbonic acid was well absorbed even with the severest work.

EXPLOSIVES.

An explosive may be defined as a substance or mixture of substances that may under certain conditions, be converted into gasses of many times the volume of the original substances. It is the pressure produced by these gasses when confined, as well as the suddenness of their formation, that causes the confining walls to break. Explosives have been divided into deflagarating or low explosives, and detonating or high explosivhs. The difference in the action or effects of those two classes depends mainly on the rapidity of their action. Deflagrating or burning explosives consists of mixtures of combustibles with oxidizing agents. These are exploded simply by setting them on fire. The combustion is communicated from particle to particle as in the burning of anything else. As this requires an appreciable time, the action, comparatively speaking, is not rapid, for this reason: The confining rock is broken up by a rapidly increasing pressure which does not shatter it as in the case of the high explosives.

The following simple tests will be of value in determining the qtality of a powder. The grains should be hard and glossy, and if rubbed on a piece of white paper they should make little or no mark; a black, smudgy mark indicates powder or the presence of moisture. A little burned on a white surface should flash quickly and leave little or no discoloration; yellow spots left on the white surface indicate an excess of sulphur.

Intercolonial Railway.

—TENDER.—

Sealed tenders addressed to the undersigned and marked on the outside "Tender for Trestle Sydney," will be received up to and including TUESDAY, FEBRUARY, 18TH, 1908, for the construction of a Hard Pine Trestle Bridge, etc., at Sydney, N. S.

Plans and specification may be seen at the Station Master's Office, Sydney, N.S., and at the Chief Engineer's Office, Moncton, N. B., at which places forms of Tender may be obtained.

All the conditions of the specification must be complied with.

Railway Office,
Moncton N. B. Feb. 1st. '08.

D. POTTINGER
General Manager.

Synopsis of Canadian North-West.

Homestead Regulations.

ANY even numbered section of Dominion Lands in Manitoba, Saskatchewan and Alberta, excepting 8 and 26, not reserved, may be homesteaded by any person the sole head of a family, or male over 18 years of age, to the extent of one quarter section, of 160 acres, more or less.

Application for entry must be made in person by the applicant at a Dominion Lands Agency or Sub-agency for the district in which the land is situate. Entry by proxy may, however, be made at an Agency on certain conditions by the father, mother, son, daughter, brother or sister of an intending homesteader.

The homesteader is required to perform the homestead duties under one of the following plans :—

(1) At least six months' residence upon and cultivation of the land in each year during the term of three years.

(2) A homesteader may, if he so desires, perform the required residence duties by living on farming land owned solely by him, not less than eighty (80) acres in extent, in the vicinity of his homestead. Joint ownership in land will not meet this requirement.

(3) If the father (or mother, if the father is deceased) of a homesteader has preemanent residence on farming land owned solely by him, not less than eighty (80) acres in extent, in the vicinity of the homestead or upon a homestead entered for by him in the vicinity, such homesteader may perform his own resident duties by living with the father (or mother).

(4) The term "vicinity" in the two preceding paragraphs is defined as meaning not more than nine miles in a direct line, exclusive of the width of road allowances crossed in the measurement.

(5) A homesteader intending to perform his resident duties in accordance with the above while living with parents or on farming land owned by himself must notify the Agent for the district of such intention.

Six months' notice in writing must be given to the Commissioner of Dominion Lands at Ottawa, of intention to apply for Patent.

W. W. CORY,

SYNOPSIS OF CANADIAN NORTH-WEST MINING REGULATIONS.

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. A free miner's certificate is granted upon payment in advance of $5 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 place, may locate a claim 1500 x 1500 feet.

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 per acre.

The patent provides for the payment of a royalty of 2 1-2 per cent on the sales.

Placer mining claims generally are 100 feet square; entry fee $5 renewable yearly.

A free miner may obtain two leases to dredge for gold of five miles each for a term of twenty years, renewable at 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. Rental $10 per annum for each mile of river leased. Royalty at the rate of 2 1-2 per cent collected on the output after it exceeds $10,00.

W. W. CORY,
Deputy of the Minister of the Interior.

INVERNESS RY. & COAL CO'Y

Time Table No. 24. Taking effect at 1 a.m FEB. 2ND, 1908.

EASTBOUND Read Down		STATIONS.	WESTBOUND Read Up	
No. 52 a. m.	No. 54 p. m.		No. 51	No. 53 p. m.
L 11 00	L 3 50	P. TUPPER JUNCTION	A 10 50	A 3 35
S 11 06	S 3 55	PORT HAWKESBURY	S 10 42	S 3 27
A 11 25	A 4 08		L 10 22	L 3 10
	L 4 13	PORT HASTINGS	A 10 17	
	F 4 23	TROY	F 10 07	
	S 4 38	CEIGINISH	S 9 54	
	F 4 50	JUDIQUE	F 9 37	
	S 5 07	CRAIGMORE	S 9 17	
	F 5 1-	CATHERINE'S POND	F 9 03	
	A 5 [illegible]		L 8 47	
	L 5 [illegible]	PORT HOOD	A 8 42	
	S 5 [illegible]	GLENCOE	S 8 23	
	S 6 06	MABOU	S 7 55	
	S 6 28	GLENDYRE	S 7 45	
	S 6 48	BLACK RIVER	F 7 3-	
	S 7 [illegible]	STRATHLORNE	S 7 17	
	A 7 1-	INVERNESS	L 7 00	
	p m		a. m.	

Trains make close connections at Pt. Tupper Jct. with I. C. R. passenger trains, excepting the Maritime Express.

CUMBERLAND RAILWAY AND COAL COMPANY.

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%	4.19%
	100.00	100.00	100.00
Sulphur	1.15%	.58%	.79%

BEST COAL FOR LOCOMOTIVE USE.

Delivered By Rail or Water

BEST COAL FOR GENERAL STEAM PURPOSES.

The year Round

IN Lots To Suit Purchasers.

BEST COAL FOR DOMESTIC CONSUMPTION.

BEST GAS COAL

Mined in the Province.

Head Office

MONTREAL

Mines

SPRINGHILL

N. S.

Dominion Coal Company, Ltd.

Miners of

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.——

ANALYSES.

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 ——6000 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.

ALEXANDER DICK Genl. Sales Agent, Glace Bay, N. S., Can.

DOMINION COAL COMPANY, LIMITED, 112 St. James St., Montreal, Que.
DOMINION COAL COMPANY, LIMITED, 171 Lower Water St., Halifax, N. S.
DOMINION COAL COMPANY, LIMITED, Quebec, Que'

—and from the following agents.—

R. P. and W. F. Starr, St. John, N. B.
Harvey & Co., St. Johns, Newfoundland.
Hull Blyth & Co., 4 Fenchurch Avenue, London, E. C.
Peake Bros. & Co. Charlottetown, P.E.I.
A. Johnston, and Co., Stockholm, Sweden.

G. H. DUGGAN,——2nd. Vice President