MARITIME MINING RECORD

COAL AND METAL TRADES JOURNAL

Dr. R. Bell
Geol. survey dept.

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

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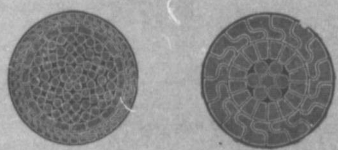

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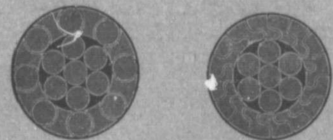

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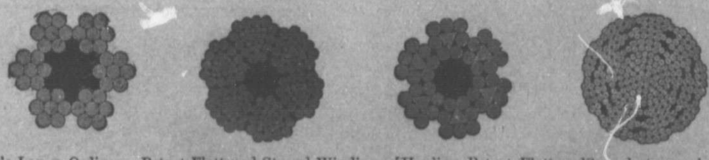

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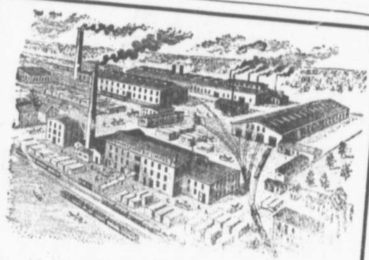

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The.... MARITIME MINING RECORD

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Selected Questions and Answers.

How would you arrest arterial bleeding and by what means would you ascertain that it was arterial bleeding?

A.—In order that the methods by which arterial bleeding may be arrested, and also the means of distinguishing the difference between arterial and venous bleeding, may be more clearly understood, I think it advisable to give a brief description of the circulatory organs of the human body.

The heart, which is the principal organ of circulation, is a hollow, conical, muscular organ, which during life is constantly pumping, or forcing, the pure, nourishing, and life-maintaining blood from the left side through the system, and receives the impure, used up blood at its right, to propel it thence through the lungs (where purification is to a great extent effected,) and finally received into the left side of the heart again, thus completing a circle, from which the name circulation is derived.

The hollow cavity of the heart is divided into four compartments—two upper and two lower cavities, The two upper cavities are called the auricles, and the two lower the ventricles; hence we have the right and left auricles, and the left and right ventricles.

The impure blood passes from the veins into the right auricle, and when full is forced into the right ventricle, from whence it is forced through the pulmonary artery into the lungs; then through the pulmonary veins the blood returns to the left auricle of the heart, from this it passes into the left ventricle. This ventricle is provided with the thickest and strongest walls of any of the other cavities of the heart, because it has to force the blood over the whole body. From this left ventricle the blood is forced into the aorta, which is the main artery, and through this to smaller arteries which branch of to all parts of the body. The pulsation which is felt at different parts of the body, is caused by the action of the left ventricle forcing a fresh supply of blood against that which is already in the arteries. The arteries, as they branch out all over the body, gradually become smaller and smaller, until at last they form a perfect network of very small tubes called capillaries (Latin, capillus, a hair, although many of the capillaries have a much smaller diameter than a hair). Whilst passing through the capillaries the blood loses its force, and on reaching the veins pulsation ceases, and the blood flows in a steady stream.

The blood, in coursing through the body, passes the dying tissues, and the oxygen in it oxidates, rusts or burns away the tissues, and in this way the heat of the body is produced. As the minute portions of the tissue thus oxidated fall into the passing blood, their place is filled, and the body is renewed by the nourishment contained in the blood filling up the places left vacant by the oxidated tissues, and thus the blood as it flows through the body becomes impure, and then proceeds from the capillaries, into the veins, and thence to the heart and lungs for purification, whence it is again driven out for distribution all over the body.

The circulation of the blood may also be compared to the ventilation of an extensive mine. The heart being the air pump, the arteries the main intakes, the capillaries the working places, and the veins the mine returns. The purified blood passes from the heart along the main intakes (arteries), is split up into the different working places (capillaries), carries away all foul properties which would be detrimental to good health, and discharges them into the main returns (veins) which carry it again to the great purifier for purification, when it is again forced through the body by the heart.

And thus the blood of the body, like the air of the mine, besides carrying the food for life and health to the different parts, acts as a scavenger, and sweeps before it any matter which would be injurious to the system if allowed to remain.

It should now be clear that to arrest arterial bleeding we must stop the flow of blood from the heart. This is done in various ways, according to to the nature and position of the wound. No doubt, the best course is the application of pressure to the wound, and if the bleeding continues the main artery should be compressed at some point in its course where it passes over a bone, at a point between the heart and the wound. (This is equal to a stopping being put in the main intake of any particular district.) If the wound be in the hand pressure should be applied at the bend of the arm or elbow, where the brachial artery divides into the ulnar and radial artries, when the passage of the blood to the hand will be cut off. Arterial bleeding of the head may be stopped by applying pressure to the wound, when the artery would be compressed against the skull. The subclavin artery is found between the inner bend of the collar bone, lying on the first rib; pressure applied at this place would prevent arterial bleeding in the arm pit. If the arterial bleeding is at the feet, the bleeding may be arrested by placing a pad at the back of the knee, and the leg bent back and tied to the thigh; should the bleeding be above the knee, the femoral artery must be compressed. This artery commences at the middle fold of the groin, and runs downwards towards the inner side of the thigh.

I would ascertain the kind of bleeding by the colour, quantity, and force at which the blood issued from the wound. The blood from an artery would be of a bright red colour, and would escape with great force, owing to the pulsation of the heart, would spurt up from the wound with a jerky jet. Venous bleeding is distinguished by the dark purple color of the blood, and the regulflow, pulsation being absent in the veins. This may be arrested by applying pressure to the vein on the side of the wound away from the heart.

Capillary bleeding is of less importance, and may be caused by a scratch or graze, and very little blood is lost.

SPONTANEOUS COMBUSTION.

Q.—If a sample of coal be finely powered and hermetically sealed up in a vessel fitted with a gauge, one or other of two effects will be observed either the gauge will indicate a gradual increase of pressure, or a gradual diminution. Account for each of these effects, and discuss their bearings upon coal mining.

A.—Either of the above effects upon the gauge may be observed. In the case of a gradual increase of pressure it strongly indicates that a process of spontaneous combustion is being set up; thus heat is naturally generated, from which the enclosed gases are expanded, ultimately causing an increase of pressure within the vessel which is registered by the gauge.

The cause of this process lies in the fact that while the coal is being sealed up a certain amount of oxygen is also enclosed, and as coal, like many other minerals has an affinity for oxygen—especially when in a powered state oxidation begins.

Now as chemical action—and this is one form—generates heat, the heat in this operation naturally exercises its influence upon the enclosed gases with a subsequent increase in pressure inside the vessel.

In the second case, where a gradual diminution of pressure is registered, there is evidently no chemical action or generation of heat, producing expansion and relatively increasing the pressure. This is somewhat opposed to the natural current of operations which generally exist under such circumstances, but two reasons are farthcoming.

1.—There is naturally a limit to the operations of oxidation, i.e., when the coal has been operated upon by the oxygen, it reaches a stage when its action stops.

2.—Some coals are much more liable to this chemical action or spontaneous combustion than others, owing to their varying natures, composition, etc. Now, in the two cases before us, the first, no doubt, has not undergone any change by oxidation and is also a sample of coal very liable to spontaneous combustion; while the latter has perhaps reached the limit of the operations of oxidation, or is not at all liable to chemical action by unison with the oxygen.

The diminution of pressure originates from the fact that, while the coal and the vessel are being handled, they are slightly warmed, therefore, when they are again normally cooled down, the gases enclosed being sealed quite warm, will contract, and subsequently a slight decrease of pressure is registered by the gauge.

The bearings of these two indications on coal mining are governing points of the operation of stowing the goaf. In the first instance it would be simply erroneous to throw back any of the small coal into the wastes, as it is very liable to rapid oxidation, from which nothing more or less could be expected than a disastrous gob fire from spontaneous combustion; therefore it should be sent out of the mine.

With coals of the same nature as in the second sample, there would possibly be no danger of trouble from gob-fires, by stowing the small coal in the goaves, from the fact that when it was finely powdered, and in its most sensitive state for oxidation, it would not oxidise; therefore, it could be stowed without any risk to life or property.

But in all cases if the small coals were at all of any commercial value, they should be sent out of the mine, when any liability to spontaneous combustion would be effectually removed from the workings of the colliery, and less waste would be duly recorded in the reports of the Royal Commission on Coal Supplies.

This first sample also illustrates the possibility of fire from spontaneous combustion, by leaving a coal-face open to the air-current for a considerable length of time.

METHODS OF BREAKING DOWN COAL.

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

The methods of breaking down coal may be divided as follows:—

1 Scalloping. 2 By the use of explosives. 3 By means of mechanical substitutes for explosives. 4 By means of mechanical and other miscellaneous substitutes for explosives. which do not produce flame.

SCALLOPING.—This is simply the method of breaking or digging the coal with the ordinary hand pick. It is adopted in seams where the coal is of a soft nature and is easily got, in firey and dusty seams where it is not safe to use explosives, and in seams where the coal is strong, but the roof is too soft to allow the use of explosives.

The chief drawbacks to this method are the large amounts of small coal got in the working, and the small output per man in seams where the coal is strong and hard to get. The former reduces the profit of the mine owing to its being of less marketable value than round coal, and the latter increases the cost of production again lessening the profit.

BY THE USE OF EXPLOSIVES.—This method is adopted in seams where the coal is hard and strong and the roof is fairly good, but it ought not to be adopted in mines which are fiery and dusty owing to the risk of explosion.

The coal is first "hewed", "holed", or "mined" so as to form a line of least resistance and allow the explosive to do its work effectively and miminise the risk of a blown out shot. This "hewing" or "mining" is sometimes done in the bottom part of the seam, sometimes in the top, and sometimes on a suitable parting in the middle of the seam. This will depend on the local conditions, and experience proves where the best results can be obtained. In some cases the "mining" is done in the underclay beneath the seam, or in a soft layer of stone above it. while in other cases the mining may sometimes be done in a dirt or stone layer in the seam itself. This does away with the production of so much small coal because the coal got in the operation of 'mining' is mostly small, however it is not often that such favourable conditions exist. The depth of the 'mining' depends a good deal on local conditions. It is rarely less than three feet and rarely more than six. The height of the 'mining at the front varies according to the depth and according to the means employed to do it. If done by hand pick it will be higher than if done by machine, i. e. for the same depth of 'mining'. While the coal is being 'mined' (if done in the bottom) it is prevented from falling on the workman by means of short props or stays called sprags which are allowed to remain until everything is ready for firing the shot and then they are withdrawn. In narrow work the coal has usually to be 'sidecut', 'nicked' or 'sheared' on one or both sides, but in longwall this is not necessary. A shothole is bored in the coal, care being taken that it does not extend beyond the depth of the mining. This is charged with some kind of explosive, stemmed, and the shot fired. The coal will be broken down along the line of least resistance (the mining) but the amount of round coal got will depend on the nature of the explosive used, and the care and skill of the miner in prepairing his 'juds' and in placing his shothole.

Under favorable and safe conditions this is the best and most effective means of breaking down coal (This subject of "Explosives and Blasting" will be dealt in another paper in order to deal with it more fully)

BY MEANS OF MECHANICAL SUBSTITUTES FOR EXPLOSIVES

This method is adopted in seams where the coal is hard and strong but which are so fiery or dusty that it is not safe to use explosives. The coal is "kirved" or "mined" in the same way as when using explosives, and in narrow work the same 'shearing' is necessary. The ordinary wedge is the simplest form of mechanical coal getter and it is also the least effective. The coal is broken down by driving the wedge in between two partings by striking it with a heavy hammer or mall. It exerts a certain amount of pressure on the coal area and the coal breaks down along the line of least resistance. An entrance is made for the wedge by making a small hole with a pick.

Other mechanical getters require a bore hole just the same as in the use of explosives but in most cases the bore hole has to be much larger in diameter and is therefore harder to bore. Multiple wedges, roller wedges, hydraulic wedges, screw wedges etc., all belong to the mechanical class and will be dealt with in a seperate paper, None of them are as effective as explosives. Many of the mechanical coal getters are heavy and cumbersome, consequently the work of using them is slow. This is why they have never come into universal use although there is a multitude of them upon the market. The use of explosives is quicker and easier and will be continued in all cases where it can be done with safety and within the Mining Law.

OTHER SUBSTITUTES.—With the worthy object of reducing the dangers to which the miners is exposed by the use of explosives, such as explosions and the effect of deleterious products of combustion, many inventions have been put forward for breaking down coal without having flame. Of course the inventors of the mechanical coal getters had the same laudable object but mechanical means have been already dealt with. None of these inventors have succeeded in displacing the explosive and none have come into general use. Scientifically, and theoretically correct though they be, they have always failed to realize expectations when put into practice. Some are too weak, some too slow, and others too expensive for practical purposes. Others again are more dangerous than the explosive they are intended to displace because although they produce no flame they give off highly inflammable and explosive gases. For example I might quote the calcium carbide cartridge. This is flameless in its action but it gives off acetylene gas which is highly explosive. The latest invention I know of is the liquid air cartridge which is said to have given good results in Germany and which was recently under trial at a colliery in Durham, England. The lime cartridge is another invention belonging to this class.

When using such substitutes as the above the procedure is just the same as when using explosives. The coal has to be 'mined' and the bore hole made in the same way and when the hole is charged the stemming must be done just as if the hole was charged with an explosive. (A seperate paper will be given on this subject.)

After all is said that can be said there is no doubt that gunpowder or blasting powder is the best means of breaking down coal or stone when large lumps are required. It is slow and rending in its action and when used by a careful, skillful, and experienced miner it will give a better and more saleable product than any other agent. The great drawback to its use is the danger. It produces a large amount of flame and gives off inflammable and poisonous gases. Good ventilation will make the latter objection of little consequence because the products of combustion will be quickly cleared away, but in a mine which is dry and dusty, or which gives off gas I would abolish its use altogether. As a matter of fact it would be necessary to prohibit the use of any explosive in a fiery mine, but there are mines in which a 'Safety' explosive could be fired by electricity with comparative safety but in which the use of gun powder would be highly dangerous.

SOME MISCELLANEOUS SUBSTITUTES FOR EXPLOSIVES

In addition to the many mechanical coal-getters on the market there is a large number of other substitutes for explosives which have been invented to take the place of explosives in mines. Many of these are very ingenius and are constructed on the most scientific principles but none have ever been successful enough to come into general use. All of them have some drawback which has prevented their adoption and few have ever got beyond the experimental stages. If an inveution could be brought forward which would do the necessary work as quickly, efficiently and cheaply as an explosive, and at the same time be absolutely safe in every respect there would be every reason to abolish explosives from our mines, but such an invention has not yet been put into the market.

For the purpose of this paper it will be sufficient to give a brief description of a few of these inventions and then the members of the Association can discuss the subject to their own satisfaction. In all cases the 'mining' and 'shearing' has to be done just as when using explosives.

THE LIME CARTRIDGE.—Patented by Messrs Smith and Moore. This consists of compressed quick-lime in cylinders 4½ inches long and 2½ inches in diameter. Mountain or Corboniferous limestone was calcined and pulverized and then subjected to hydraulic pressure at 40 tons per square inch. This doubled its density.

Seven cartridges making a charge 2 ft. 8 inches long were put into a bore hole and strongly tamped with clay. Each cylinder of compressed lime had a groove ½ inch deep moulded in it and all these grooves were placed upwards when placing the charge into the hole. A perforated metal tube ½ inch in diameter was placed along these grooves before stemming the hole one end of the tube being left protruding from the hole. The outer end of the tube was fitted with a tap. When the charge was ready water was forced through the tube by means of a small hand pump and then the tap was closed. The water caused the lime to heat and swell giving off steam, thus pressure was exerted on the coal breaking it down. The lime expanded to five times its own size and the steam generated exerted a pressure of 2270 lbs. per sq. inch. The maxium temperature according to Prof. Abel was 700 F,

The following are the advantages of the lime cartridges given by Major Moselv,

1. Absolute immunity from explosions of gas. 2 No flame. 3 No smoke or noxious fumes 4 Little dust. 5 By the rending action the coal is got in good condition. 6 Roof not shattered. 7 Skilled labour unnecessary.

The following are some of its disadvantages.

1 A great deal of time is lost in boring large holes. 2 Cumbersome appliances are needed. 3 Lime is slow in its action taking at least 20 minutes. 4 There is danger of the stemming blowing out, and half slacked lime is not a very pleasant thing to be struck by. Several men are said to have been blinded in this way.

5 The coals were whitewashed by the lime. 6 Where the coal was hard and strong the lime was too weak to break it down. 7 Where the coal was open the steam escaped through its pores giving a 'standing' shot. 8 Although the maximum temperature is too low to ignite gas 700 F is sufficiently high to ignite fine coal dust.

THE CALCIUM CARBIDE CARTRIDGE.—This is a new German invention and consists of a cartridge divided into two parts by a thin tin partition. One part contains carbide of calcium and the other contains baruim hypo oxike and sulphuric acid. The latter eats away the tin partition and sets up chemical action giving acetyline gas and steam. This exerts the pressure and breaks down the coal. This looks likely to be slow business at the best but when we consider that acetyline gas (C_2H_2) is given off we cannot look upon the cartridge as a safety appliance. Acetyline has an explosive range of from 3 to 82 per cent and 1 lb. of calcium carbide (CAC_2) will produce from 4½ to 5½ cubic feet of acetyline, therefore if the cartridge does not produce flame it produces a dangerous gas.

COMPRESSED AIR SHELLS.—These consisted of steel shells ½ inch thick 3 1-16 inches outside diameter, and 14½ inches long. They were put into a bore-hole the same way as a charge of explosive and then compressed air was forced into them until they burst and broke down the coal. A pressure of 10000 lbs per sq. inch was necessary to do this so that it it obvious that air shells are not to be considered as a substitute for explosives. The cost of inconvenience is prohibitive.

THE LIQUID AIR CARTRIDGE.—This is a new invention which was first tried in some mines near Munich in Bavaria and afterwards in one of the Durham collieries in England. It is said to have given good results in the first case but I havent seen any account of the results obtained in Durham,

The cartridge consists of cardboard cylinder filled with some absorbing material. A detonator is inserted in the cartridge. It is plunged into a vessel containing liquid air and absorbs some of it. Then it is quickly placed in the hole and stemmed and the charge exploded by meanes of the detonator which is fired electrically. Its blasting force is equal to dynamite. The liquid air is contained in vacuum jacketted vessels of darkened glass. The vacuum jacket was invented by Prof. Muir its being to prevent any heat from reaching the liquid air as heat would evaporate it.

The following are the advantages claimed:—

1 Absolute immunity from flame. 2 It is safe to handle. 3 No products of combustion to foul the atmosphere only air being given off. 4 In case of non-explosion the cartridge becomes harmless in a short time owing to evaporation 5 It is as powerful as an explosive.

The chief disadvantage is the expense and it is not likely to be a great success until a cheaper means of production is invented. It seems to come nearer the ideal than any other invention but cheaper production and better means of storage and transport are necessary before it takes an important part in mining work. Liquid air is a comparitively new idea and no doubt when it becomes better known and more used many of the difficulties will be surmounted. The use of the detonator might be a slight drawback to the liquid air cartridge. In the course of the Hebburn tests with explosives some detonators were also tried. Out of 25 detonators fired in a mixture of coal gas and air there was 4 ignitions. Out of 27 detonators fired in a mixture of pit gas and air there was 2 ignitions. Thus it is shown that a detonator alone can ignite CH_4. However there is the explosive less and that is always so much danger abolished. With respect to the statement that a misfire charge soon becomes harmless owing to evaporation, it is well to remember that the detonator cannot evaporate and therefore it will be as necessary to exercise caution as if the hole was charged with any other explosive.

Whether the invention will ever become a success, or otherwise remains to be seen, but the idea seems to be worthy of consideration.

HINTS FOR CARE OF HOISTING ROPES.

The engineer must guard against paying out slack rope after the cage has come to rest on the chains. He must also avoid careless and sudden starting and stopping, or any treatment likely to produce shocks. If the sheave grooves are filled with wood blocking—as they should be—the blocking must be watched and kept in good repair. A rope should never be allowed to run over any irregular and unequal surface In putting on a new rope kinks must be avoided. A kink once made permanently weakens the rope at that place. A hoisting rope should not be changed from a large rope or sheave to a smaller one, because it adapts itself when in use, to the radius of curvature, and would be weakened by a change. The same is true, in a less degree, by a change from a small to a larger drum or sheave, since the bending increases the crystallisation of the wires and also the wear against one another in certain places as they accommodate themselves to the shape of the drum, and when they are bent in a different direction by a change of size of drum they are likely to break when first worn.—Mines and Minerals.

Maritime Mining Record

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R. DRUMMOND, PUBLISHER.

STELLARTON N. S. February 22nd 1905

Rubs by Rambler.

In last issue I offered some favorable criticism of an article which appeared in the Provincial Workman', having for its subject the Relief Funds. Had I not been pretty well versed in the subject, having had a good deal to do with the establishing of the fund it is doubtful if I would have written as I did. From a statement in the last issue of the Workman I am led to believe that the article I criticised favorably -was produced when the Editor of the paper was off on a winter holiday. Of a second article on the subject, in the Workman, I cannot speak so favorably as the first, as it does not show so firm a grasp of the subject as that shown by the interim editor. I am really sorry for this, for if any one should have a full, broad grasp of the subject it should be the exponent, or one who may in some quarters be looked upon as the exponent of the views of the colliery workers. As discussion in this column is prohibited, as a rule, I will enter into no controversy even of a friendly character. But I may be permitted to say that if the view, that surpluses are dependent on numbers, big memberships wholly, then such views is erroneous. Receipts, out of which surpluses come, may be proportionally larger, much larger,—while the fees are the same,—at a colliery where four hundred men are employed than at one with five hundred workmen. At Dom. No. 1, for instance, the fund receives fifty per cent on the members contributions from the government, whereas the fund at Springhill may only receive thirty one per cent, for the reason that the output does not entitle it to so large a sum, proportionate to contributions, as the fund at Dom. No. 1, which while only half as strong numerically, as the Springhill Fund has a larger output to present. Again take the Albion Mines. The fact that it takes more men to produce a certain quantity of coal at this mine, than at Springhill and a very much larger force than at Dom. No. 1, the percentage on members contributions received from the government instead of being fifty is only twenty-nine per-cent. Let me here say to avoid captious criticism, that I freely admit that it would be most difficult to adopt a general system of government payments that would adjust itself perfectly to each particular case. If absolute justice is to be done then each colliery must be dealt with seperately, for the reasons that some districts may be less healthy, and some collieries more liable, than others to accidents. I ought to be specially interested in the success of the funds, and it is solely with a desire to place them on a just equitable and strong footery that I occupy so much space. If the government could be induced to abolish the three tenths per-cent part of the agreement, and instead give fifty per cent on the members contributions, provided the companies did the same, it would no doubt be a decided advantage to the funds as a whole.

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For some reason or other not a few of the workers at the collieries when they have grievances to ventilate take the RECORD editor into their confidence. While gratified with this mark of esteem we are not quite sure that the RECORD is the proper channel through which complaints should be conveyed. We have a dread of interfering in what some others may claim as their exclusive privilege, to wit, the righting of colliery workers wrongs. Be that as it may, the RECORD, at no matter what cost, is ready to give space in the interests of reform,—remedying of wrongs. A correspondent who gives his name in confidence evidently has been hit on a sore spot. He has several complaints as follows:—

(1) He asserts that the government has appointed some C. B. mine managers to be Mining Instructors—"It would be well" he adds "that some who had been appointed had now their certificates by merit," The sting of the foregoing is in the tail for there may be nothing whatever wrong in a mine manager being a Mining Instructor, though the RECORD is free to confess that the managers ought not to be instructors if other equally suitable men can be obtained. There are several reasons that might be urged against the appointment of managers. We will give only one, and that the least. They receive the best pay at the collieries, and therefore should be content that the emolument attached to the offiee of Instructor should pass to one who probably needs it more.

(2) He alleges that "It is generally reported that there has been a leakage in the Mining Examinations." The RECORD heard something like that a while ago, but the trouble is to locate the leak. It was just in order that such allusions, illusions—delusions should receive their quietus that the RECORD suggested in a late issue a new method of examination.

Our correspondents final assertion is that:—"Practical miners are troubled at seeing men appointed to positions who never had a months practice in or out of a mine." We can scarcely credit this statement. All we can say to our correspondent is that if he furnishes the name of an overman, underground manager, or manager of any mine in Nova Scotia who holds a certificate of competency, for either of these positions and who has not spent three months underground, not to say one month, the mines department will be immediately called upon for an explanation,

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In the last issue of the Surburban, Mr. Alex. McNeil's pithy magazine—newspaper, appears an article entitled "Reciprocity and Cheap Coal" by that present day irrepressible coal reciprocationist, W. C. Milner, Mr. M's present zeal reminds me of some remarks of Mr. H. M. Whitney—good luck to him—When the New England Gas and Coke Coy's bill was before the Massachusetts Legislature. Mr. Whitney declared, that if the legislators would pass the bill, he would strive with all his soul and strength and might and mind to give the people of Boston and vicinity, dirt cheap gas of good quality. I believe he honestly attempted to fulfil his declared promise, but though he took off his coat and went at it like two—sixty—whatever that may mean,—he did'nt quite succeed. And I'm just wondering if no better luck is to attend friend Milner in his wide, many, and painstaking efforts to bring the people of Nova Scotia to believe that the salvation—in a sense—of the province's coal trade lies in reciprocity with the United States. As I said, in last issue, I have an open mind on the subject of reciprocity, and, looking for light, I am a little disappointed that, in the article to which I am referring, there is not the slighest glimmer. I might wish I had space to review, in extenso, Mr. Milner's article. Just a few sentences on one or two points. When it is stated that "Cheap coal in connection with deposits of iron ore is the backbone of British manufacturing industry, and that these two secure to Great Britain, her ascendancy in the markets of the world," no one may raise dissent, except to qualify the word 'cheap' by the word 'comparatively.' But when it is asserted that the resemblance between Great Britain and Nova Scotia is striking, as 'both are the possessors of coal and iron,' I, for one, say 'hold' and ask, 'Where is the Iron?' If the reply is 'Nictaux,' then I tell Mr. Milner that no steel and iron works in Britain, is so far from its fuel supply as is 'Nictaux' from hers. Is Mr. Milner aware that we have, so far as regards coal for blast furnaces, cheaper coal in Nova Scotia than in Britain. The average price of coal in Britain, at the pits mouth, for the past four years was two dollars and sixteen cents a ton, or for the two years 1902, 1903, a dollar and ninety seven cents per ton. I fancy Mr. Ross would be well pleased to sell coal to any point in Nova Scotia, in hundred thousand ton yearly lots, at a much less figure than that. Not during the past ten years has the price of coal in Britain been so low as the price charged by the Dominion Coal Co. to the Dom. I. and S. Co. We are told, in the article, that the secret of Britain being able to ship 6 million ts. ofcoal to Germany, for instance, is cheapness of coal. If that be so how does it happen that during the past ten yrs., —with dearer coal—Germany has increased her iron and steel production, and shipbuilding, at a rate that has given Mr. Chamberlain fits of the blues. Is it not a fact that the busiest year, during the past ten, Britain witnessed in the iron trade, was the year that coal was the dearest. I do not say that cheap coal is not essential; I merely point out that it is not 'all essential' or as Mr. McNeil might say a "sine que non.' Mr. Milner is surprised that the coal owners in 1877 and 1891 were eager for reciprocity, while those of '05 are evidently opposed. He says, 'Conditions have changed since then.' So they have, both on the other side of the line and on this. Owing to extraordinary development of mines, railways, and transportation generally, coal has gone on decreasing in price, while as a rule, owing to the higher rates for mining and increased cost of pit material, it has kept on increasing with us. According to Mr. Kennelly—quoted by Mr. Milner—the Nova Scotia operators could have sold coal in Boston at $3.25, made up as follows:—Cost at Sydney $1.35, duty, $1.75, freight $1,00, sundries 20cts. If they could get that price to-day some of our operators would at once begin large shipments. Conditions have changed since 1877 and 1891—when there may have been a glamour about reciprocity. In 1877 Nova Scotia had a larger market in the United States than in Quebec. In 1895 though the value of that market had largely increased, it was only half what it was last year. The Quebec market is now one not to be lightly put in jeopardy, and if the operators prefer to cling to a sure market of fair size, rather than venture attemps to secure an uncertain if larger market, they may not be open to hasty, hostile criticism I wish Mr. Milner, or any other body could give some sort of assurance that Nova Scotia could, coal being on the free list, get a market for four or five millon tons at a price [illegible]ing from $2,80 to $2,90 a ton. If the answer is 'Yes' I may give my name as a candidate for initiation; if the answer is 'Not at so high a price,' then I fear I must declare in favor of things as they are.

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Could you be true to eyes of blue.
If you looked into eyes of brown?
Could you be true to blue?
I wonder what you'd do?

There is a lively row in progress between the Montreal and Toronto members of the Canadian Mining Association. President Coste and Vice President Hardman are having a stiff time of it. The story is too long to relate in full, I will try and give the substance. In Sept. a council meeting was held at Montreal at which a nominating committee was appointed. The president Mr. Coste. called in question the regularity of this meeting In Dec. a second meeting was called, and the committee already appointed was re-appointed. Mr. Coste gave the committee some names that had been suggested to him including his own for the Secretaryship. After a time the committee met and selected from the names before it for all offices except that of Secretary, for which there were no fewer than six applications. The nomination of any one of the six would raise sectional and personal issues hurtful to the institute. The committee finally agreed to ask Dr. Porter to be Secretary. He consented, provided his services were accepted free and he be given clerical assistance. The council instructed the Treasurer in the absence of the Sec'y to send out the ballots, which he did, and the row became active. A most monstrous sin committed by the committee was the sending out of the ballots printed on yellow paper instead of green. On this sinful paper appears the name of Thomas Cantley for 1st V. P., and of Robert Coll, and Meissener as the council for Nova Scotia. This yellow business affected Mr Coste greatly, and caused him to issue the following circular on green paper.

"I enclose herewith an official green ballot for the election of officers and councillors of the Canadian Mining Institute for the year 1905-6, to be voted on or before Friday morning the 3rd. of March next.

The previous yellow ballot papers forwarded to the members from Montreal are not in order, since, as provided by the by-laws of the Institute, paragraph XXIII:—

1st.—They were not issued from the office of the Secretary of the Institute.

2nd.—They did not include all the nominations duly made to the Secretary.

3rd.—They were issued before the time for nominations had expired.

Therefore, members of the Institute will please vote again, if necessary, according to the instructions printed on the enclosed official green ballot.

The unauthorized yellow ballots will not be recognized."

Then Mr. Geo. E. Drummond issued a circular defending the committees action, to which a Mr. Craig sends the following spirited reply—I will give portions only.

"I am in receipt of a circular from Mr. Geo. E. Drummond defending the position he finds himself in regarding the so-called ballot sent out. The by-law governing the matter provides three things:—

(a) That the Nominating Committee is to send in its nominations to the Secretary.

(b) That other nominations may be sent to the Secy at any time not less than thirty days prior to the annual meeting. (That the Nominating Committee cannot pass on these other nominations is shown by the fact that they can be made at a later date than its nominations.)

(c) That the Secretary, and he alone, is to send out the list of nominations not less than three weeks before the annual meeting.

Mr. Drummond admits that the nominations made by the Committee should have been sent from the Committee to the Sec'y and issued by the latter, but he adds: "The President who acted also as Sec'y was not in Canada at the time. The Treasurer therefore issued it under orders of a regular council meeting."

If Mr. Coste had been here before the thirty days elapsed he could only have sat still until they had elapsed and he had received all the nominations. As a matter of fact he was back at his office before the thirty days had elapsed. This means that his absence in January did not delay the matter one hour.

I understand that Mr. H. M. Lamb was nominated as Secretary on the 15th of December, by Mr. Robertson, Provincial Mineralogist of British Columbia, and seconded by Prof. Gwillim, of Queen's University. What right has anyone who was aware of this nomination to send out a ballot with Mr. Lamb's name ommitted?

I myself have nominated Dr. Gilpin as Vice-President, Mr. P. Kirkegaard as Treasurer, and Prof. Brock as a member of the Council. These nominations were made by me prior to the expiry of the thirty days. No ballot can possibly be legal without these names being included.

Mr. Drummond evidently is of the opinion that the nominating committee has the right, by excluding all nominations that do not suit it. to virtually elect. Were this the case the government of the Canadian Mining Institute would be a self-perpetuating oligarcy much resembling that of Russia."

"P. S.—Mr. Drummond's circular states Dr. Porter was chosen in order to avoid sectional feeling. Dr. Porter is a man of fine attainments, but his position as Chairman of the Mining Section of the Canadian Society of Civil Engineers renders him perhaps the most objectionable man that could be chosen for our Secretary. This Section of the Society of Civil Engineers draws papers which should come to the Mining Institute. Most of our members will remember the fight which the late B. T. A. Bell had to put up against the Engineer's Society.

Mr, Drummond states Dr, Porter is to be furnished with clerical assistance If the work is to be done by a proxy and the proxy to be paid, would it not be better to have a man whom we can hold direct accountable? It is stated that this clerical assistant is to be the business manager of the Mining Review."

On all of the above Rambler makes this comment. "And this is the Society that wants the N. S. M. S. to again federate wiih them."

A RECIPROCITY FEELER.

Le. Canada, alleged to be Mr. Prefontaine's organ, had an article on coal of which the following is the closing paragraph;—

"Now supposing that there was a reciprocal understanding for the abolition of the coal duties on both sides of the line, the manufacturing industries of Quebec and Ontario, at least the western part of the province, and Manitoba also, would benefit the Canadian side. On the American side the industries of New England and those of the Pacific coast would be gainers. And who would suffer?

The Montreal Gazette commenting on the article says;—

"In connection with Le Canada's article, Canadian coal experts explain that the duty imposed by the Canadian government on soft coal from the south is 60c. per gross ton of 2,240 lbs., while the American government charges 60c. on every net ton of 2000 lbs., imported from the Dominion of Canada, which is equal to 67 1-3c. per gross ton of 2,240 lbs. Furthermore, the Ontario manufacturer invariably uses American slack coal, upon which the Canadian duty is but 13c. per net ton of 2000 lbs., or 15c. gross. With regard to the amount of business in coal between the maritime provinces and the New England states, nearly all of this is in slack coal, which pays a duty of 15cts. The quantity of 'run of mine' or lump coal exported to the New England states is less than that sold by the United States mines in eastern Ontario, and cannot therefor be considered as being in anyway a factor in the case. It is further said by experts, that reciprocity in bituminous coal so far as Canada is concerned, is of negative value to the Dominion, because if enacted or agreed to, it would close down at least all of the small mines in the lower provinces, as well as to deprive thousands of Canadians of means of obtaining a livelihood. Such enactment would also wipe out a large share of the provincial revenue

AROUND THE COLLIERIES.

The snow is piled up around the Cape Breton collieries and has greatly retarded outputs.

Dom. No. 2 has no fewer than twenty leading places going, while the Hub has only one or two.

The Dom. Coal Co. will bank very little this winter, probably the tailings of what they cant ship.

It is stated that Japan has given an urgent order to a Scottish firm for fifty powerful locomotives.

It is said that Mr. Alex. McEachern of International may try the effect of Coloradian air for his throat trouble.

It is said that sinking to the dip has been suspended at Broughton. At present it seems to be burrowing near the surface.

International colliery has not done any coal hoisting for market for some time, although a number of repairs are being effected.

During the stormy weather of ten days ago some of the C. B. collieries were without mail for five days—instead of having a mail daily.

It is expected that a change of management at one of the Dominion Coal Companies mines may result in the influx of some more Scottish miners.

A correspondent remarks that the changes lately made at the collieries in C B. in the official staffs were as sudden as they were startling, and says there are more changes to follow.

One of the C. B. mine managers has not the highest opinion of C. B. miners. This is a pity as they are the best under conditions existing in this county. He must force himself into this belief or he will bring a peck of troubles upon himself.

The barrier pillar between Dom. No 2 and International colliery may be pierced by a bore hole and piped, in order to let through part of the water of International, and drawn up by tank at No. 2, material or water shaft.

Nearly all of the collieries of the Dom. Coal Co. were brought to a standstill for a day or two from a most unusual and unexpected cause. There was no powder to blow the coal with, owing to the accident that befell the powder works of the Acadia Powder Co. at Waverly

The tunnel projected to connect International with the rise workings of the Stirling has started. It is estimated that it will take twenty-four months steady driving to complete the work. The tunnel will skirt No, 2 Harbor seam rise workings.

Dom. No. 1 north and south deeps are rapidly advancing downwards. When No, 1 enters the submarine area the barrier pillar will be left so that a dam can be built at any time to safeguard the lower workings. The deeps will be narrowed to 9 feet going through the barrier, 90 feet thick. Part of this may be dug out and connected so that it may be ready for dam building in the event of water flowing in.

The work now planned out for International colliery will lengthen its life by ten or twelve years.

There are forty coal cutting machines now working in Dom. No. 1. By spring the mine will be in splendid shape for a high average output.

At a majority of the collieries the first half of Feby. the underground officials, perforce, turned over a new leaf, and did little swearing. The overground boses had complete control of the market. The snow slump did it.

The French slope at the Reserve is to be repaired and straightened out. Also a new bank head, admitting of a straighter lead to the landing place of the boxes, may be begun shortly. The curve on the old bank head was very hard on the haulage ropes.

So far as yet made up, the Dom. Coal Cos list of steamers, to be employed during the season of 1905, contains sixteen names. The probability is that two or three more names will be added shortly. Three of the steamers have a capacity of 6000 tons each, and the latest addition to the fleet will be able to take a load of 6500 tons of coal. Seven of the remainder carry from four to five thousand tons.

Mr, George Wilson, accountant of the Acadia Coal Coy. since amalgamation has resigned that position, the resignation to take effect in about six weeks. Mr. Wilson has had it in his mind to quit desk work for the past two years, but was induced to hold on. This year no inducements were strong enough to cause him to alter his decision. As he says himself he has been forty odd years behind a desk and in all that time has not had a lengthy holiday. It is no wonder if he thinks it about time to make a start. Mr. Wilson is a decent fellow, unassuming, and modest, and having said that the RECORD need say no more. Wherever Mr. Wilson may go, whatever he may set his mind to do,—to keep him from wearying if not from mischief, the best wishes of the RECORD go with him. Mr. John K. Fraser who has had much and varied experience will take Mr. Wilsons desk.

Continued from page 17)

Nova Scotia derived from coal royalties.

With respect to the removal of the duty on anthracite coal, it has been proved that coal dealers and not the consumers are the gainers. The general result would be that coal would not be sold any cheaper in Canada, where active internation competition establishes prices, but it would result in causing a combination among coal owners who would pocket the duty which is now received by the respective governments.

THE COAL DUST THEORY OF EXPLOSIONS.

This was the subject of a lecture by Professor Shea before the Derbyshire Colliery Undermanagers Association. The collated evidence went to show beyond doubt that coal dust does act, under certain conditions, as a very destructive explosive agent. Where the explosion has been due to the presence of gas the destruction has been far greater and more widespread where, at the time of the explosion, there has been coal dust on the roadways and workings. But experience showed that where gas had not been present there had been coal dust explosions of terrific force. It has been demonstrated that the more powerful explosives, such as roburite, were less likely to ignite the coal dust than the less powerful explosive—gunpowder. The presence of coal dust it has been ascertained, greatly extended the area of an explosion, materially increased the sensitiveness of fire-damp, considerably increased the volume of flame, and the amount of after-damp resulting from the explosion. Where no dust was present the smallest per-centage of fire-damp capable of producing an explosion was six. But where dust was present as low as one per cent. would produce an explosion. As it was very difficult to detect as small a quantity of fire damp even as two percent, the danger arising from the presence of dust in mines was thus very apparent. There might be an explosive mixture of fire damp and coal dust in the pit without anyone being aware of the fact. Once the coal dust became ignited it produced gas by the generation of heat and partial combustion of its particles. The most serious affect of mine explosions was the production of after-damp, the most deadly of gases. The presence of large quantities of carbon, in the shape of coal-dust, ensured the production, in the event of an explosion, of large quantities of this deadly gas. Much of the loss of life attending colliery explosions was due to the presence of afterdamp. The danger arising from fire-damp has been reduced to a very low point by better ventilation of the pits, and to that extent the danger of explosions had been reduced. But there was still the danger arising from shot-firing; that was the most frequent cause of explosions to-day. Unhappily they could not yet do without shot firing. But that danger could be reduced by the use of the most suitable explosives, and by watering the roadways and workings before shot-firing took place. Where this practice had been most rigorously observed, explosions resulting from shot firing had practically ceased. Where explosions had occurred in mines, those portions that were wet mostly escaped the effects of the explosion. Although the number of explosions had been considerably reduced by preventive measures, it was yet a fact that there was considerably more dust in the pits to-day than formerly. This was partly due to the greater depths of the workings and the increased temperature consequent thereupon, and partly also to the greater speed at which the work was carried on. The larger volumes of air sent down into the workings carried the dust away from the screens and other head works with it. This dust was carried great distances into the workings, and the lighter particles were, of course, carried the furthest. Thus they got their mine atmosphere charged with an explosive agent which only awaited a favourable moment to ignite.—S. and A. of Mining.

DO GOLD NUGGETS GROW?

Gold in its natural state, like many other products of the earth, is an article of development. What its original elements are is still a matter of some speculation, but the fact has been demonstrated that a nugget of the precious metal left in its original environments will gradually, though slowly, attract to itself minute particles of gold dust, and after a lapse of years possess an added value.

Gold is constantly being formed in rocks and veins and places. Just what it is that the baby gold formation feeds on to effect its growth is not known. If it were a new and wonderfully lucrative industry might be born, and all other kinds of farming, save the growth of gold, might be temporarily abandoned. The formation and growth are due to mechanical and chemical action. As in the case of the animals or vegetable, existing gold has existed in some other state before assuming its present form. Waters which percolate through the earth's crust are said to contain certain substances from which gold is formed. Thus gold, like the animal and vegetable, must have water in order to thrive. The gold in the water is deposited when it meets the proper precipitant. The precipitant may be an earth current or electricity in the rocks.

It has been claimed that the nuggets found in placers are the formations from the waters that percolate throuh the gravels, and are not from the decomposed quartz, as generally supposed. Those who so contend site the fact that in the centre of nuggets can often be found a small grain of iron sand. This was the nucleus around which the earth current of electricity created or deposited an electro-plating. During long ages this influence was at work causing the gold to form round this little grain of iron ore, and then grow to become a bright, shining nugget of gold much larger and purer than any ever found in the veins of ore.

BLUE HEAT IN BOILER PLATES.

Every boiler maker and apprentice who is not posted on the fatal blue heat should at once become familiar with this subject through an actual test, which can be made in the following manner:—

Take a piece of steel about 2 in. wide and about 24 in. or 30 in. long, any thickness from, say, ¼ in, to ⅝ in. Grind the surface on the emery wheel or grindstone until it becomes bright for a distance of about 10 in. or 12. on one end, so that you can observe the colour when it makes its appearance. Then take it to the blacksmith or flange fire, and hold it on top of a clean fire, thus preventing it from becomming smoked up so badly that you cannot see the colour. Now move the piece slowly back and forth over the fire and watch it closely until the blue colour appears, which will be about the same as is used for tempering a flat chisel for boiler shop use. Then take the piece to the anvil and bend it over double without breaking it if you can. You will find it will break every time. Take the other end of the same piece, which is perfectly cold, and you can bend it over double without breaking. The higher the tensile strength, the quicker it will break. Soft fire-box steel will not break so rapidly. This experiment will prove to your satisfaction why many corners have been cracked by heating them just hot enough to produce a blue heat, as the steel will stand far more abuse perfectly cold than it will at a fatal blue heat. If you are working up steel, and you see the blue colour coming into the steel, stop at once and apply more heat, or you may wish you had taken the advice here given. At a very small cost a little crude oil or gasoline heater can be made, and in less than five minutes very heavy material can be made white hot and worked up without any danger of cracking the plates.

Nearly every boiler maker who has followed our advice and made the necessary experiment to familiarise himself with the fatal blue heat will insist on having some sort of a heater in the shop for doing his work properly, or he will have sense enough to tell the proprietor that he will not be responsible for the cracking of plates which are heated by placing chunks of red-hot iron on the place to be worked up. This method never heats a plate hot enough to insure working it without danger of cracking, but by using crude oil or gasoline you will never have a break if you stop pounding in time and apply the heat again. It requires but a few minutes to make it white hot again, and all danger is thereby avoided.—Motive Power.

SAFETY FUSE.

In some Notes on Safety Fuse in the Journal of the Chemical Metallurgical and Mining Society of South Africa, Mr. James Thomas says human life depends in a very great measure upon the quality of the material placed in the miners' hands, and in the proper use, and not abuse, of the fuse by the miner himself. In some quarters the idea of cheapness comes before quality, but a so-called cheap, unreliable fuse is dear at any price. If the general opinion of the manufacturers and importers were taken it would, he is convinced, be in favour of a good class of fuse at a fair price. At present the price is unreasonably low for a good and reliable fuse suitable for the requirements of the mines. Below cost should not be expected from any manufacturer or importer. The fuse known as Bickford's safety fuse was first patented September 6th. 1831. The powder used should be of fair quality and free from chlorate, a powder slightly glazed being more suitable than a dead unglazed one. The graphite used in glazing not only helps the powder to work smoothly, but also assists it to resist moisture. All gunpowders are not equally suitable for the manufacture of safety fuse. All else being equal, the larger the grain, the faster the burning of the fuse. In England manufacturers can obtain powders to suit almost any particular requirement, and in fact, make their mixing of powder every day or oftener, varying their mixing to suit the weather. A powder that burns to the required time, say, on a day with a south wind, would possibly give trouble on a day with a strong, dry east wind. In fuse making Mr. Thomase's most troublesome days have been those of the latter kind. To know how to obtain good results when the weather is changeable is not the least of the secrets held by the manufacturer, each one having his own little dodges. In countries where the manufacfurer can only get his powder from the Government, and has to take what is given, other ingredients have to be introduced. If more attention was given to (1) more careful handling, (2) fuse never to be allowed to stand in a damp place (3) fuse to be cut clean the last thing before insertion into the detonator—the result would be less miss-fires.

THE NATURE OF COAL.

Coal is generally spoken of as a mineral product, although perhaps, in a strictly scientific sense, it is not really a mineral. It is found in beds or layers, interstratified with beds of sandstone, shale, etc., at varying depths beneath the surface of the earth. A bed or seam of coal usually retains its quality, thickness, etc., without variation, over considerable areas. Some beds of coal are very thin, too thin to be workable, whilst others are thicker. Coal is black in colour, but the character of the blackness varies with the kind of coal. For instance, some varieties of coal have a dull or dead black surface, others have bright and glistening surfaces. Some kinds of coal have a crystalline fracture, others a "conchoidal" (shell-like) fracture. Coal is composed principally of carbon, hydrogen, and oxygen, with small quantities of other elements.

How Aluminium was Found.—Aluminitm is found in clay, felspar, slate, and in other minerals and rocks Prior to the discovery by a German chemist named Wohler, it had been known to exist, but the difficulty was to obtain it from natural sources. This difficulty was overcome by Wohler more by accident than design. He had just been mixing some chloride of aluminium and sodium together, and, not requiring the compound at the moment, put it aside on the stove. Presently he picked it up, when, to his agreeable surprise, he found that he had obtained the metal in minute globes or beads through the compound having become heated.

A good deal as to the future of the Dominion Iron and Steel Company, depends upon its ability to produce steel rails. That it can produce steel rails of the desired quality is the opinion of many friends of the public, but that may be taking a good deal for granted. Practical demonstration will require to be made before it can be asserted that the Company is wholly out of the woods. In a certain grade of pig iron, and in rods, the company is doing a snug and profitable business but the trade in these is scarcely sufficient to command the full product, and to pay expenses and earn dividends for so large a concern. While the RECORD is inclined to be optimistic as to the future of the concern, it does not wish it to be inferred that all before the company is absolutely smooth sailing. On the success of the rail mill, depends a good deal the future success of the company.

The Dom. Coal Co. are making arrangements for the erection of a discharging plant at Halifax. This is evidence that the company anticipates extending its business at this point as a tower costs all the way from twenty to forty thousand dollars. The company has secured a wharf property adjoining the Tram Coy's Power House.

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CANAL BANK, POINT ST. CHARLES, MONTREAL.—

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 fifteen 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 bars 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 should 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 2000 feet. All other placer claims shall be 250 square feet

Claims are marked by two legal posts, one at each end, bearing notices. Entrys 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 if 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 to the value of at least $200.

A 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 ree miner.

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

Petroleum.—All unappropriated Dominion Lands in Manitoba, the North west Territories and within the Yukon Territory, are open to prospecting for pet roleum, and the Minister may reserve for an individual or company having machinery on the land to be prospected an area of 1920 acres for such period as 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
Deputy of the Minister of the Interior

Dept. Interior.

PRODUCER GAS.

A direct saving to fuel may possibly be effected by the more general introduction of producer gas; at any rate, it seams to be an established fact that less fuel is required to produce a certain amount of steam if it is first converted into gas than if it is burnt direct in the boiler. This corroborates the conclusion, drawn from a large number of boiler trials, that the average waste of fuel in a boiler is very high, say 30 to 50 per cent. The cause of this waste is excessive air admission at the furnaces, which is necessary, partly on account of the smoke nuisance, partly on account of the wear and tear of the boiler. The maxium heat loss due to smoke is about 1 per cent. Most inventions for the removal of this smoke consist in arrangements for admitting air, resulting in further reductions of efficiency amounting to from 20 to 30 per cent. When smokeless coals are used, and as the conditions of firing are as perfect as can be, furnace temperatures approaching 5,000 Fahr, could be attained. Such excessive temperatures must produce very severe stresses, both in furnace plates and in water tubes, and such intense heats must increase the wear and tear of a boiler, and are, therefore, not desirable. A solution to the difficulty seems accidentally to have been hit upon, when, for totally different reasons, the Admiralty sub-divided their Belleville boiler by adding a so-called economiser. The essential point of the alteration is, however, not the economiser, but the addition of a second combustion chamber, yet in spite of the principle of double combustion being but imperfectly carried out. in that case the economic results are said to be exceedingly good.

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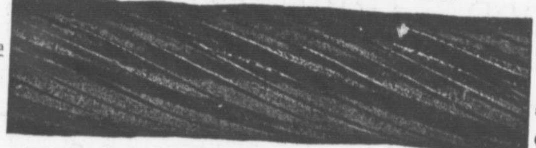

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