

# MARITIME MINING RECORD AND COAL AND METAL TRADES JOURNAL

Dr. R. Bell  
Geol. survey dept

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

New Series Vol. 7 No 2

July 27th.,

STELLARTON, N. S.

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21 Mixed from Hopewell .....	7.35
62 Mixed from Truro .....	8.00
65 Mixed from Mulgrave .....	11.40
27 Mixed from Pictou .....	10.40
19 Express from Halifax and St. John .....	10.45
130 Mixed from Pictou .....	10.45
30 Express from Sydney .....	15.50
85 Express from Montreal and Halifax .....	15.40
22 Mixed from Pictou Landing .....	18.10
77 Mixed from Hopewell .....	18.45
86 Express from Sydney .....	19.25
65 Express from Trenton .....	21.05
17 Express from St. John .....	21.15

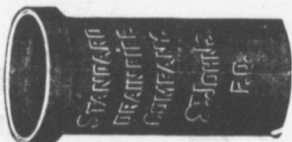
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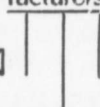
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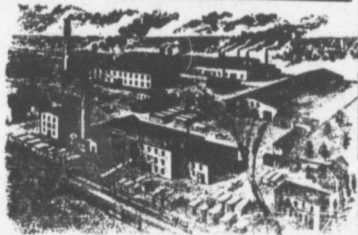
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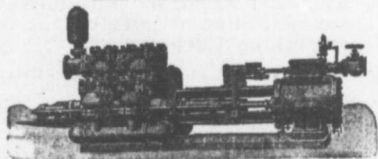
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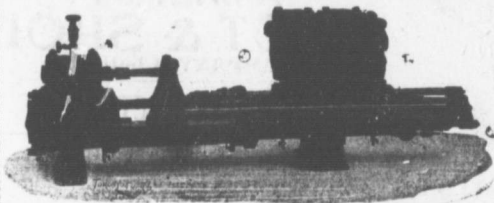
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The....

# MARITIME MINING RECORD

Vol. 7, No. 2. Stellarton, N. S., July 27th 1904 New Series

## GEOLOGY.

Conclusion of Mr. J. W. Marshall's first Lecture.

The aqueous rocks are those which have been formed by the action of water. The word is derived from the latin word aqua, meaning water.

These rocks generally occur in regular beds or layers.

There are three classes of aqueous rocks viz:—(a) Sedimentary, (b) Chemical, (c) Organic.

(a) The sedimentary aqueous rocks are those which have been formed by the deposition of sediment in water. The denudation of the rocks exposed on the surface is carried out by such agencies as rain, running water, ice, wind, the sea, etc. The debris resulting from this denudation is washed down into the streams and rivers, and carried away in suspension by the running water. When the mouth of the river is reached, the burden carried by the stream is deposited into the sea or lake into which it flows. The speed of the current will slacken gradually, therefore the heavier particles will settle first, while the lighter particles will be carried further out and there deposited. Thus nearer the shore there will be a deposit of gritty particles and away further out there will be a deposit of fine sand or mud. In time these deposits will become hardened by pressure and heat, and will form beds of hard rock. Sand will form sandstone, mud will form shale, and the heavier particles which settled first will form beds of grit.

(b) Chemically formed aqueous rocks are those which have been formed by the deposition of chemical substances. Assume a river to be flowing into a lake which has no outlet. If the river carried down carbonate of calcium (lime) in solution, the water of the lake would become highly charged with it. The sun would evaporate the water and the carbonate of calcium (CA, CO<sub>2</sub>) would be precipitated forming a deposit of limestone. The Magnesium Limestone of Durham, England is a chemically formed limestone of lacustrine (lake) deposition. A river which carried down sulphate of calcium (SA SO<sub>4</sub>) under similar conditions would form beds of gypsum, or should the substance in solution be chloride of sodium (salt) (NA CE) beds of rock salt would be deposited.

(c) Organically formed aqueous rocks are those which have been built up of organisms. In the sea there are millions of minute organisms, shellfish. Large numbers of these die daily and their hard parts are deposited on the bed of the ocean. In this way beds of chalk and limestone are formed. Chalk and limestone are thus examples of rocks formed from organic animal life. The chalks of the south of England and

the Carboniferous Limestone are typical of this class.

Coal in all its varieties is organically formed from plant life. Therefore coal is typical of an organically formed rock.

3. METAMORPHIC ROCKS—The word metamorphic is derived from two Greek words:—meta—a change, morphe—form. Therefore the word means change of form.

We often meet with rocks belonging to both the igneous and aqueous classes which have undergone a considerable amount of change since they were deposited. Heat, chemical action, or pressure has brought about this change. In the case of rocks belonging to the aqueous class it is often only their stratified character that indicates their class. They have become coarsely crystalline in texture and have all the appearance of igneous rocks.

EXAMPLES—Mica schist is granite altered by pressure so that the mica is found in thin foliations instead of being intermixed with the quartz and feldspar.

SLATE—Slate is shale which has been altered by that and lateral or side pressure to such an extent that the rock now splits at right angles to the original bedding planes.

Quartzite is sandstone which has been altered by heat. The particles have become all fused together. Marble is limestone altered by chemical action. Kaolin is decomposed granite.

Serpentine is decomposed gabbro.

Anthracite and graphite might be stated here as coal altered by heat and pressure.

These are only a few of the many examples which might be given.

## SECOND CLASSIFICATION ACCORDING TO OCCURRENCE.

Under this heading we have two classes:—1. Stratified, 2. Unstratified.

1. Stratified rocks are the aqueous rocks and are those which occur in regular beds or layers, generally parallel to each other. Originally they were horizontal but we generally find them more or less inclined and sometimes much contorted.

These rocks are generally made up of thin layers or laminae which are parallel to the inclination of the beds and parallel to each other. This bedding or stratification is the chief characteristic of stratified rocks and it is generally so highly developed as to be plainly visible. Shale, clay, sandstone, etc., are examples.

(2) Unstratified rocks are the igneous rocks, which occur in irregular masses without bedding planes, partings, or lines of stratification of any sort. Granite,

basalt, diorite, dolerite, etc., are examples.

3 Classification. According to chemical composition. There are five classes:—

(1) Arenaceous or sandy rocks composed of silicon-dioxide (SI O<sub>2</sub>) or quartz. Sand, sandstones, and grits are examples.

(2) Calcareous or limey rocks, composed chiefly of calcium. Chalk, limestone and marble are examples being composed of carbonate of calcium, (CA CO<sub>3</sub>). Gypsum is another example being composed of Sulphate of Calcium (CA SO<sub>4</sub>)

(3) Argillaceous or clayey rocks, composed chiefly of silicate of alumina or clay. Clay, shale, slate, fire-clay etc., are examples.

(4) Carbonaceous rocks, are those which are composed chiefly of carbon. Coal in all its varieties, and oil shale are examples.

(5) Fragmentary rocks, or rocks which are composed of fragments.

We have two chief divisions:—

(a) Conglomerates or rocks formed of rounded fragments or boulders cemented together by a matrix.

(b) Breccias or rocks formed of angular fragments cemented together by a matrix.

The matrix in either case is generally siliceous or calcareous.

Gravel and shingle are also examples of fragmentary rocks.

I think this is sufficient in the way of classification so I will give two useful definitions and then give some examples of the different rocks.

1st Definition.—Rock. To the geologist the term rock means any substance forming part of the earth's solid crust. Soft substances such as soil, sand, mud, gravel and clay are considered as rocks just as much as hard substances such as granite, sandstone, and shale.

2nd Definition.—A MINERAL

Sir Archibald Geikie defines a mineral in something like the following terms:—“A mineral is an inorganic substance, having a definite chemical composition and generally of a definite geometric form.”

Under such a definition coal, limestone, and many other substances cannot be classed as minerals owing to their organic origin. However, from a mining point of view, a mineral is considered to be anything which can be extracted from the earth's crust to promote industry and be of use to man. This latter definition is rather sweeping but it allows coal etc. to be classed as minerals, and after all it is less likely to confuse the mind of the average mining student.

SOME EXAMPLES OF ROCKS.—Granite is composed of three minerals:—quartz, feldspar, and mica. It is an igneous rock, very hard, very heavy, and without any lines of stratification. The different colours in granite are due to the difference of colour in the feldspar crystals. It is used for building and ornamental purposes, and is capable of taking a high polish.

It is a quartz porphyry resembling granite in composition, but it occurs in dykes or veins running through the granite. The rock is said to be a sign of tin and other ores near. It is found abundantly in Cornwall, England, of various colours and characters, sometimes having a beautiful porphyritic structure. It takes a fine polish and is often formed in ornamental tables and vases.

Basalt is a very heavy fine grained rock, generally

black in colour. It often occurs in columnar masses as in the Giants Causeway, Ireland, and Fingals Cave, Staffa, Scotland. It is also found as dykes and intrusive sheets in almost all coal fields. It is hard, tough, and durable and is much used for road metal. It is composed of Plagioclase feldspar, Hornblende, Albite and Iron.

Dolerite is of the same composition as basalt but it is different in texture due to the fact that when the basalt was thrown up in a molten state it cooled rapidly, but when the dolerite was thrown up it cooled slowly. The intrusive sheets under Arthurs Seat, Edinburgh Scotland are composed of dolerite.

Syenite is an igneous rock composed of Orthoclase feldspar and Hornblende. This composition is variable. Syenite and Diorite are often considered to be the same rock and there is really very little difference when we consider their constituents.

Obsidian or volcanic glass forms the bottom layer of a lava stream. It is hard and brittle, and breaks just like glass. It is very glassy in appearance greatly resembling ordinary bottle glass. Its constituents are the same as those of granite: quartz feldspar, and mica.

Pumice is a porous lava rock which has a frothy appearance. It forms the top part of a lava stream. It is composed of Orthoclase feldspar and Hornblende.

Clay.—(Sir Archibald Geikie.)

Clay is a white, brown, or blueish substance which when dry is soft and friable e.g. Fullers earth. It adheres to the tongue and when shaken in water turns the water turbid. When moist it is plastic, when mixed with water it becomes mud. Shale is clay hardened by pressure.

Slate is metamorphosed shale, or say clay. It has been so altered by lateral pressure that the particles have been rearranged, so that the rock now splits at right angles to the original bedding planes. The composition silicate of alumina, remains the same.

Sand generally consists of rounded particles of quartz (SI O<sub>2</sub>). It is the result of the breaking up of rocks such as granite which contain quartz.

Sandstone is sand consolidated by pressure.

Quartzite is metamorphosed sandstone. The particles have become fused together forming a crystalline rock. The metamorphosis is due to the action of heat, or to heated water traversing the beds.

Mica Schist is an altered granite. Pressure has had the effect of rearranging the mica in thin layers, laminae, or foliations, thus mica schist is said to be a foliated rock. The mica gives it a glistening appearance. It forms the matrix of many minerals, either as embedded crystals, or as veins running in cavities through the mass. It is a common matrix for garnets, emeralds, sphene, tourmaline, and many others. In some places it is used for slates for roofing, and for building purposes, but only for rough work.

Kaolin is a decomposed granite. The feldspar has become weathered leaving the mass in a soft putty state, often white in colour. It is used as potter's clay. Large deposits occur in Cornwall, England.

Many other examples might be given but time will not permit.

This subject will be continued in the next lecture.

## -:- Maritime Mining Record. -:-

The MARITIME MINING RECORD is published the second and fourth Wednesday in each month.

The RECORD is devoted to the Mining—particularly Coal Mining—Industries of the Maritime Provinces.

Advertising rates, which are moderate, may be had on application. Single Copies 5 cents. Single Copies 5 cents.

R. DRUMMOND, PUBLISHER.

STELLARTON, N. S.

July 27, 1904.

## Rubs by Rambler.

The Grand Sec'y of the P. W. A. Mr. Moffatt, contradicts the report published in a portion of the press that a movement would be inaugurated at next Grand Council meeting looking to the confining of membership in the association to mine workers only. Mr. Moffatt says the association has not altered its policy of willingness to assist all workmen whatever may be their particular calling. Mr. Moffatt certainly could make no other statement than that the P. W. A. would see the steel workers out in the present struggle. Seeing the strike was sanctioned by the Grand Council, they are bound, if even a mistake was made in the first place, to stand by the Steel workers, until there is a termination one way or the other of the present trouble. After the settlement, however, it may be quite proper for the lodges to discuss the question whether the lengthening of the cords of the P. W. A. has resulted in increased strength and usefulness. Has the admission of those engaged in trades other than mining added to the prestige, or the influence, of the association? That is a subject on which, no doubt, a great deal can be said. It may be nice to have allies, to know you have the sympathy of those beyond one's own borders; and yet it is possible that allies, instead of being a practical help, increase the difficulties and add to the complications. If the one object of the P. W. A., in extending its borders is to give assistance to others who cannot hope to succeed so well, without that assistance; and if that object can only be secured at a sacrifice to the most numerous class among its members, and these know that the policy of extension involves sacrifices, which they are willing to make, then their motives can only be applauded. But if the question is narrowed down to "Has the P. W. A. been strengthened. Have the old lodges of the P.W.A. been benefitted, or are likely to be benefitted by the bringing in of workers outside the coal mines," then whatever may be said in the affirmative, much can be said in the negative. A leader conversant with the needs and aspirations of miners may be readily obtainable, but one familiar with the ins and outs of the miners, and of the steel workers, and railway men, and of other avocations, it is scarcely possible to secure. Better for the miners that they have a leader, as now, thoroughly posted in mining matters, than have one with a more or less accurate knowledge of half a dozen trades.

The miners of Nova Scotia, as union men, stand on a different footing from any other class of laborers. Much of the improvement in the lot of the miner, and the improvement is wonderful, is due to the fact that special legislation in his interest has from time to time during the past 25 years been introduced and passed. Miners, in a sense, are wards of the provincial legislature, both are linked together in a special manner. The province can make laws affecting mining and those engaged in it, while it has not the power to interfere with the carrying on of other businesses. For instance, it is not within the power of the local government to say that a man attending an iron furnace shall have an eight hour day; while it is within its province to declare that a miner shall only work eight hours for a day, and that he must have a certificate, and so on. As a union the miners got all the legislation they have persistently asked for: they could not have got more if every trade in the province went to make up the association. I am not discussing the point, only trying to show that if the question of restricting the P. W. A. to mine workers only should ever come up a good deal could be said in its favor.

I want a little light, and so I am going to propound a couple of questions, to the candidates who successfully passed at the late examination for colliery officials. The first question is, "Where the coal is hauled from a mine by means of a slope what advantages does a steel bankhead possess over one constructed of southern pine, or N. S. hemlock." I don't mean a wooden bankhead such as at Reserve which has an ancient look about it, and which was constructed before the days of patent box greasing awers were invented. Mr. McVey would be the very first to admit that if ever the Reserve bankhead goes up in smoke, it will be record smoke for blackness. You see its this way—as McEachern would say,—with the Reserve, if it doesn't continually be making some kind of a record it is not happy. When its not a record output, its a record outburst, in which friend McVey is not content to be a common end man, or a mere looker on. I don't mean an extraordinary bankhead like the Reserve, but an ordinary one like that at Sydney No. 3. Or, if the question is too narrow, confined to slope bankheads, only let it be widened to, "Are steel bankheads to be preferred to wooden ones, and why?" The second question is, "Would you recommend a system of longwall working in an 8 foot seam of clean coal with a fairly good roof like the Phalen." The reason I ask the latter question is because it is reported, and I'm inclined to think there is foundation for the report, that some English experts brought to Glace Bay by Mr. Jas. Ross have recommended that system. If asked for advice I would say 'dont' but then I may be old fashioned. If the passed men cannot or wont answer then I have one recourse left. I will hold up "Jas. Baird the chairman of the Board, and ask him to deliver.

Four weeks ago in referring to the Sydney strike I said in a whisper that there were some in touch with the government who could not afford to allow the

strike to continue much longer. That was before the soldiers were brought in. I scarcely thought, however it would be brought home to those comprehended in the word—some—so suddenly, and so startlingly, as it, has; and while I had said in the course of conversation, with an energetic resident of Sydney, last Tuesday, that the delay in appointing a commission would be the certain undoing of certain of the politicians. I was not prophet enough to add, 'that proof of my statement would be forthcoming in a couple of days.' I am just after reading in the Halifax papers of the big P. W. A. meeting in Sydney where it was resolved, as a means of 'striking back' at the government 'for its laxity,' to form a labor party, and run a labor candidate; and as a result of the reading of this resolution I am torn with conflicting emotions. Some may look upon the statement as a figure of speech, and declare it is impossible to be so torn. Go easy. For many a day when a person spoke of a shock causing a falling at the stomach, I laughed, I didn't believe in that, but I am not an unbeliever to-day. My experience came in this fashion. I had been in Halifax watching the passage of the Arbitration bill, through the Assembly. The owners penalty clause was there; the workmen's penalty clause was wanting. With that clause short shipped the bill safely passed its three stages in both houses. I chuckled, and as the session was near the close came home well satisfied. Within a few hours after my home coming I got a telegram from the Premier saying the little omission had been detected and rectified just before the house prorogued. Something inside snapped, and down my stomach fell good two inches. It hurt my digestion for months after. Of course had I been an expert those days in the use of adjectives the calamity might have been averted by the diversion. But I was only an amateur in politics then. Or it might have been averted had I been able to gnash my teeth in rage, but I was afraid to do that as they were new and I was uncertain as to their quality. I'm torn in this fashion:—I scarcely know whether to frankly cheer, sardonically grin, or dubiously shake my head. To cheer may, perhaps, be premature, so let me fall back on a good grin, while I mutter:—"In 1898 they went out for another fellows wool and in 1904 they themselves come home shorn" and in a faint, rather than a humble spirit:—"Their chickens are coming home to roost." I could go on and mutter:—"Being paid back in their own coin" or "They sowed to the political flesh and of that same flesh they are reaping destruction." I am not speaking these things out loud, only muttering them as a sort of relief to my varied feelings, and as a compromise to human nature. Those in the plot, and many of the P. W. A. ninety eights, will have an idea of what my mutterings mean. And perhaps the former will begin to think that a half loaf was, is, better than no bread and an awful lot preferable to a scorpion. I am just as free from malice as from guile, so I stop grinning to shake my head. The grin was for the benefit of those who were not friends; the shake is in the interest of those who are not foes. I am not going to say to these 'though you think you have been despatchedly treated don't strike back,' but I may ask "Are you sure you are hitting in the right way, and will not suffer from a rebound of the blow." I remember once, in conversation with B. F. Pearson,

I was scalping a fellow who had done me a scurvy trick, and outlining a war like policy, when B. F. with his characteristic immobility remarked, "Would it not be the wisest way to kick him up stairs; it may pay best in the long run." In my then frame of mind the expectation of ever so many points profit would have made no change, but I have since often thought there was wisdom and paying policy in the remark. Of course it was just another way of telling me to heap coals of fire, but I scouted the idea and hinted that it would assuage me more to pour on his head kettles of boiling water. I may confess that on a time I was nearly a third party man; that was long ago, but with growing years came maturer wisdom. The kicking up stairs process turned out to be fairly successful. If the workmen think they have been slighted, or ill treated, by a party, it may be theirs to mete out punishment, but as a third party, as things at present are in Canada, they cannot expect to wield so much influence or obtain so many concessions, as if in alliance, if not in thorough accord, with one or other of the two dominant parties. If the assertion is made that as things are in Canada, concessions, favors, or privileges are bestowed proportionately to an individual's, or a body of individuals political influence, I cannot make denial, and if this new move of the P. W. A. is to demonstrate that they are politically a power there may be justification for it. It some are ready to declare, "It is a mad move" others may be ready with the retort, "May be, but there is method in it." I fancy the move has flustered somewhat the politicians in Cape Breton County, and furnishes a fresh topic for discussion at a time when current subjects were growing stale. Having said all this I have still a lingering doubt as to the intentions of the P. W. A. really to run a candidate, as this would be a reversal of the avowed policy of the present executive, who declared that the society would not, as a body, soon meddle with politics.

\* \* \*

Some of the papers—among them the esteemed Sydney Post—give forth signs of exuberance over what they are pleased to call Mr. Chamberlain's continued success. From what they say of him one who never saw an old country paper might be led to assume that Mr. Chamberlain and his lieutenants were cutting a clean and a wide swath through the ranks of the free food fellows. Perhaps the Post and the others are setting us all a good example, by showing how possible it is to draw big chunks of comfort from seemingly adverse happenings. The fact is that the government's dickering with Mr. Chamberlain has cost it dearly. Since Mr. Chamberlain set out on his protection propoganda in May of last year there have been twenty contested elections, and one lost to the government by default. Of these twenty-one seats the liberals held five only and the Tories sixteen. The liberals now hold thirteen of the seats and their opponents eight. In one of the seats retained by the Tories their majority was increased by 92, while in Warwick it was reduced 641 votes, Chorley 2617, Warwick 641, Dulwich 1605, Lewisham, 402, Ludlow 2850, and even in South Birmingham it was reduced 497. The liberals on the other hand retained the five seats formerly held by, in some

cases, phenomenal increases. For instance in Bernhard Castle they increased their majority by 1364 votes; in Normanton 2527 votes, while Norwich showed an increased liberal majority of 3,303. In nineteen seats at the last previous polls the Tories had a majority of 16,000 while at the polls at the bye elections the liberals have a majority of 6,500.

The bumps of some of the writers for the C. B. papers are either largely developed or the bumps of some others sadly depressed. For instance one paper stated that there were two thousand in a procession in Sydney which took place two or three weeks ago, a second paper put the number at 1500 while a third said the actual count was 620. A Halifax paper and the Glace Bay Gazette say fully four thousand crowded the other night into the Rosslyn Rink, on the occasion of a P. W. A. demonstration, while the RECORD places the number at 1500 to 2000. There is a wide difference in the estimate, so wide that one is inclined to think that one of the scribes can count no better than a crow, while the other is an improved lightning calculator.

A couple or so of years ago, a leading member of the Executive of the P. W. A. remarked in the course of a friendly conversation, that the society would steer clear of politics as that was the rock on which it had nearly foundered. Being, as I believed, in a position to do so I controverted the latter assertion and maintained that had the P. W. A. not demonstrated that it had some influence politically it never would have obtained from the local government the concessions and privileges it now enjoys. I see the Glace Bay Gazette admits this is the case, and says that much of the legislation secured was due to the political influence demonstrated by the society in the return of Mr. Ang. J. Macdonald to the local legislature. It seems this view also obtains outside the province. Mr. Colin McKay, who the Montreal Star says is well acquainted with the conditions in the Maritime provinces says:—"The announcement that a labor party has been launched in Cape Breton will not surprise those who are familiar with conditions in the eastern part of Nova Scotia. As a matter of fact, the Provincial Workingmen's Association has for years been more or less of a political organization, though its operations have chiefly been confined to provincial politics. The Provincial Government has always recognized that it was a factor to be reckoned with, and the fact that Nova Scotia has to-day the most satisfactory system of mining laws in existence is chiefly due to its political activities."

Of course the P. W. A. did not constitute a third or labor party. There was no necessity that it should. Indeed as a third party its influence would have been of little avail. It may be put this way; any political influence the society has was cast in favor of the government at Halifax and for that reason the government was not unmindful or ungrateful. In forming a third party I am not going to now say that the executive are right or that they are wrong. It is their right and privilege. Still I may be permitted to draw attention to a fact, which carries on the face of it a plain

inference. There are presently two labor members at Ottawa, one, Ralph Smith, was a liberal though elected by the labor party, and as a rule he votes with the government. The other Mr. Puttee was run and elected as an independent labor man. He is fitful in his voting. And what is the consequence. Mr. Smith when asking for rights and privileges for his constituents is more earnestly listened to by the government than is Mr. Puttee. Assuming this statement is correct the question follows "How is it so."

#### BLANTYRE'S 'MINER DOCTOR.'

Under the heading Blantyre's 'Miner Doctor' a correspondent of the Glasgow Mail tells wonderful stories of cures effected without instruments or the usual accessories of the surgery. The blind may not be made to see, but from all accounts the crooked are made straight and the lame to walk. Here is a part of what the correspondent says:—"Dr. Livingstone made it an impossibility for the name of Blantyre, in Lanarkshire, ever to be forgotten. After a long lapse of years another "doctor" has risen up, and his fame as a healer of numerous diseases by a system of what is termed "bloodless surgery" has won for him a reputation which promises to extend to various parts of the United Kingdom. "Now," writes a correspondent, "I am not going to vouch for any cures said to be effected. But this I will vouch for, that the hundreds who have visited the Lanarkshire "miner doctor" have gone on their way rejoicing. Blantyre on Saturday last was taken by storm. Two train loads of maimed and infirm folk were dumped down here from Lancashire. They mostly came from Bolton, Burnley, Preston, Accrington, and Manchester. They came in search of "Dr" Rae, and their mission was easily accomplished, so far as that gentleman's identity was concerned, for the occupant of Raploch Cottage is one of the best known men in the district. I have read in the "Old Book" of the POOL OF SILOAM, which at certain seasons was "troubled," and into which if a man stepped he was cured. As a boy I have often pictured to myself the crowds round that same pool, and how they eagerly waited till the waters were so strangely stirred. On Saturday that picture came back to my mind. Certainly there was no Pool of Siloam for the friends of the sick to bring their relations to. But the setting of that famous picture was wonderfully correct for all that. Round the cottage were crowds of traintired toil-worn men; little children were also there; and all had gathered or been brought to Raploch Cottage in the belief that if they only came under the hands of this homely doctor they would go home cured. Many wonderful stories did I hear of his skill, but, as I said before, I am not going to enter on any discussion as to his abilities. Rather let me tell you what some of the strangers thought of this village genius. "I have come from 'oam at considerable expense, and when ah goes, oam an' tells the owd one I'm cured there ill be nowt but crying for joy. E's a wonderful old chap; 'e is. There was a little nipper here who had spine disease, and 'e bean't and 'ealed him. Last am told 'e did and fowk don't tell lies 'bout such things." A woman who had waited for some considerable time before she got the opportunity of bringing under the eyes of the "doctor" her little girl came out with gratitude writ large on her face."

## AROUND THE COLLIERIES.

Mr. J. R. Cowans, of the Cumb. Ry. & Coal Co'y, and family have gone for the summer to their home at Partridge Island.

The boys at the Joggins quit work last week because the lamps of some of their number had been stopped because they went home before six o'clock.

Mr. John Smith, auditor of the Acadia Coal Company was off duty for a week or two owing to illness. The RECORD extends congratulations on recovery.

The slope, No. 1, of the Inverness Ry. & Coal Co., is now down to the 5th lift. Development work is well ahead. The output should keep on increasing from this out.

The Cape Breton miners at a mass meeting in Sydney last week, said they would shoot. Will their declaration have the effect of causing the possum (Mulock) to come down.

The pic-nic season is interfering to a considerable extent with the output of some of the collieries. It takes a colliery two days at least to fully recover from the effects of a pic-nic.

Who is to be manager of No. 6 colliery? Well, now, that depends a good deal upon who is manager of the Dom. Coal Co. What is the matter with Bown? He at least is to the manor born.

There are few men at Mabou now, not more than ten, two pumpmen, two compressor men, two firemen, a coal hauler, and three officials. It is to be hoped active operations will soon begin.

The dredge was expected any day last week at Mabou to dredge the channel so as to permit of fair sized vessels passing out with coal cargoes. The Mabou people expect to ship some cargoes in the Fall months.

Mr. Thos. Blackwood has taken the place vacated by James Maxwell at the Acadia colliery. Mr. Ling takes Mr. Blackwood's place at Thorburn. Both are good men and the output of neither colliery should suffer from the changes.

A correspondent living near Reserve Mines in sending the name of a new subscriber says he is sorry for the present members, as they have been, politically, fatally injured by the strike. As we do not know to which side in politics our correspondent clings, the weight to be attached to the statement is uncertain.

The coal men were on the wing last week. Mr. A. D. C. Genl. Sales Agent of the Dominion Coal Co., went through to Boston. Mr. J. L. Brass went to Sackville, to see about a snow plough, thus taking time by the forelock. Col. Cann of the Mabou Co., was billed to leave Boston on the 12th for Mabou Mines. W. B. Ross of the Steel Co'y went home to Halifax from Sydney in good humor, under the determination to add to his stock of steel holdings, and so on.

Some of the papers gave the Dominion Coal Co., a most extraordinary output for June. With great deliberation it is set forth in the head lines and reiterated in the body type that the output was 290,000 tons in excess of any previous month. That would make the months output considerably over 600,000 tons. The Dom. Coal Co., may get there some day, but not this year or next.

Many will hear with regret of the resignation of Mr. J. L. Brass, as Genl. Manager of the Inverness Railway and Coal Co. It is understood Mr. Brass will retire from the position, which he so well filled, at the end of this month. During his residence in Inverness, Mr. Brass set on foot many schemes all looking to the betterment of the community. He went when the output of the collieries was small, say 5000 tons a month; he leaves when the collieries are in the way of becoming large producers as testified by the June output which reached nearly 28,000 tons.

The Mines Department, seemingly, has at last reached the conclusion that it is not too old to learn. If the Ontario government can issue under its auspices a hand book on explosives, why should not the Nova Scotia government have issued a hand book on drilling. Mr. D'Arcy Weatherbe of the Mines Department has got together a lot of useful matter bearing on the several kinds of drills and how to operate them, which has been issued in booklet form by the Department of Mines. This little book cannot fail to be serviceable to those who contemplate boring.

If Bartlett the lessee of iron ore areas on the East River of Pictou has all the ore on the areas he claims, there is a golden opportunity open to him to have the areas developed. There is a snug and in every particular a very nice blast furnace at Ferrona which the RECORD is sure can be purchased on reasonable terms. Mr. Bartlett has held the areas for a score of years and more. Some people think that it is about time the government were interfering and asking Mr. Bartlett what are his intentions. The government has every right to do this, as if no gentle compulsion be used the areas may remain undeveloped for another score of years.

Among the papers—leaving out the Halifax paper which fathered the story—which placed the increased output of the Dom. Coal Co'y at no less than two hundred ninety thousand tons and which being pretensions ought to have shown a fuller knowledge of the subject, is the Maritime Merchant which says—editorially, "At this time when there is a probability of the Cape Breton coal mines being involved in the Sydney strike it is pointed out that the output of the Dominion Coal Company for June was about 290,000 tons in excess of any previous month this year." This is on a par with the Port Hood absorption, by a syndicate, parable.

## AROUND THE COLLIERIES.

Deputy Minister of Labor King is in Sydney in an effort to get at the bottom of the difficulties between the steel coy, and its employees.

As the editor is planning an outing in August the RECORD is published a week ahead of time though the regular date is maintained on cover. A similar course will likely be adopted next issue, and the issue following. The first issue in Sept. will be on the regular date.

The twelfth was like a Sabbath at Westville. The Drummond was bottled tightly up, and the Acadia could not start as less than a baker's dozen of men put in an appearance. On the day after some 150 men failed to turn up for work at the Drummond. This bears out the statement that on figuring the output more than the days set for pic-nics have to be reckoned with.

### INVERNESS RY. & COAL CO.

Shipments for June 1904	25,576 tons.
"    "    "    1903	14,982 "
Increase for June 1904	10,594 "
Total shipments 6mos. '04	74,669 "
"    "    "    '03	59,575 "
Increase for 6mos. '04	15,094 "

From the Garlock Packing Coy, advertising patron of the RECORD, has been received a handsome pocket purse, with note book combination, made of morocco and finest leathers. It is a sensible substitute for a calendar, and from its looks will be as serviceable as the packings manufactured by this company, which are famous over not only the Dominion but other countries.

The output of the Albion Mines averages about 550 tons and this cannot be increased under existing conditions. The plant at the slopes was designed to handle about 750 boxes daily, while over 800 boxes, frequently, are hoisted. The McGregor slope must remain inactive until the coal in the overlying seam has been won, and that will be a year or two yet, and by that time the Allan Shafts will be in operation.

Mr. E. W. Parker, in a report entitled: "Production of Coal in 1902," makes the following statement:—The entire coal output of the United States, from the earliest times to the close of 1902, has been estimated to amount to 4,860,000,000 short tons to December 31, 1902. The cubical dimensions of a ton of coal will vary from 33 to 40 cubic feet. Taking 37 cubic feet as an average from the total product of the United States, we find that this mass of 4,860,000,000 tons would contain, approximately, 160,000,000,000 cubic feet. A pyramid built of this material as high as Pikes Peak (14,108 feet) would have for its base a rectangle 1.14 miles square. A cube constructed of it would cover an area of 24 square miles.

The Sydney Record's account of the labor party meeting in Sydney, makes John Moffatt tear the Sydney Post into "shreds." We have been trying for a while to get that quality paper, but can't.

While the Sydney Post has made no reference editorially, as yet, to the formation of a third party, the Sydney Record takes up the cudgels on behalf of the government. For one thing the 'Record' does not seemingly intend to take it lying down.

Mr. Chas. Fergie takes charge immediately as chief engineer and agent of the works of the Inverness Railway and Coal Co. Mr. Fergie is not unfamiliar with Inverness as while it was as yet called Broad Cove he was consulting engineer in installing the plant and driving the slopes. As the Inverness coal field is a big one Mr. Fergie has a large field and increased scope for his well known energy.

The Halifax papers are still hammering away at the strike and giving rumors and reports which are nothing if not disquieting. They revive the report that the miners may come out. When that happens the steel workers acknowledge their case is desperate, and different from the way it was viewed at the outset. The report that the whole plant will practically require to be rebuilt must be injurious to the company and the thousands of poor people who have stock in it.

The rather peculiar assertion has been made that the installation of the big Jeanesville pump at Albion Mines was a mistake and that the old system of hoisting, by water tanks, by way of the old Ford pit shafts was preferable. That is scarcely apparent to the ordinary mind, as the present pumping arrangements have enabled the company to dispense with the services of 2 engineers, 4 firemen, 3 pumpmen and a carpenter. Besides 12 tons less of coal per day are used. A saving of probably \$30 to \$40 per day have been effected, and that surely is no trifle.

### The Dominion of Canada Guarantee & Accident Insurance Company,

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**LIBERAL FORMS. PROMPT SETTLEMENTS.**

A first class Company to work for.  
Agents wanted at unrepresented points.

**ALFRED J. BELL,**  
General Agent, HALIFAX, N. S.

## ELEMENTARY GEOLOGY.

Second lecture given before "The Maritime Mining Students Association" Springhill, N. S. June 24th. 04.

## ORDER OF SUCCESSION OF ROCKS.

When a book is written we often find it divided into several volumes. The volumes are divided into chapters, the chapters into paragraphs, and the paragraphs into single words. Then the book is often illustrated by pictures and diagrams.

To the student of geology the earth's crust is a book and from it he must read the geological history of the earth. The aqueous rocks composing the earth's crust occur in regular order known as the order of superposition. This order is never reversed, and although some of the rocks or formations may be sometimes altogether absent, we never find a formation lying above, another formation in cakes where it should lie beneath it. For example—the Carboniferous rocks are never found below Silurian rocks, and the Silurian rocks are never found above the Carboniferous rocks. Of course the oldest rocks are the lowest, and the newest rocks the highest in order of succession.

Geological time is divided into four Ages which represent the four volumes of the book. The four Ages are divided into formations, periods, series etc, which represent the subdivisions of each volume, and the illustrations of the book are represented by the various fossils of plant and animal life found embedded in the rocks.

The four great geological ages are:—

4. Cainozoic or Tertiary.
3. Mesozoic or Secondary.
2. Palaeozoic, or Primary.
1. Hypozoic, Archaean, Eozoic, or Laurentian.

(4) The word Hypozoic is derived from the Greek words:— hypo—beneath, zoe—life. Therefore it means beneath life periods.

The word Eozoic is derived from the Greek:—Eos—dawn, zoe—life—the dawn of life.

The rocks of the hypozoic age are the oldest of all the aqueous rocks and the name was given to imply that no life existed at that period. However I have mentioned in the previous lecture that the fossil Eozoon Canadense is found in hypozoic rocks in the neighbourhood of the River St. Lawrence. Eozoon means the dawn of animal life and thus the name Eozoic is applied to the age because in it we find the first signs of life. The name Laurentian which is so often applied to this age is derived from the river St. Lawrence.

(3.) The word Palaeozoic is derived from the Greek Palaeo—ancient, zoe—life, therefore it means ancient life. It is applied to indicate that in rocks of this age we find evidence of the most ancient forms of life. The name primary is also often applied to this age for a similar reason.

(2) The word mesozoic is derived from the Greek meso—middle, zoe, therefore it means middle life. It indicates that the rocks of this age are those which were formed in middle life periods. This age is also called the secondary age.

(1) The word Cainozoic is derived from the Greek Kaino—recent, zoe—life, therefore it means recent life. It indicates that the rocks of this age are com-

paratively recent. This age is also known as the Tertiary.

There seems to be a disposition on the part of some geologists to take the most recent of the Cainozoic rocks as a fifth age known as the Post Tertiary, or Quaternary Age. This is due to the fact that it is only in these rocks that traces of man are found. This age includes the Pleistocene formation and the rocks which are at present in course of formation.

The following is the order of succession of the aqueous rocks:—

	(Eng'ish.)	
Cainozoic or Tertiary	Past Tertiary (Present, Past Glacial or Quaternary)	Pleistocene Pliocene Miocene Oligocene Eocene
	Tertiary proper	
Mesozoic or Secondary	Cretaceous	Chalk Gault Neocomian
	Jurassic	Oolite Lias
	Triassic	Keuper marls New Red Sandstone
Palaeozoic or Primary	Permian	Magnesium Limestone Marl slate Sand
	Carboniferous.	Upper Coal-measures Millstone Grit Carboniferous Limestone Lower Coal-measures.
	Devonian and Old Red Sandstone.	
	Silurian Ordovician or Ordovian. Cambrian	

Below these come the Plutonic igneous rocks. The intrusive igneous rocks and the volcanic rocks are found distributed throughout all the geological periods.

Time will not permit a description of the various periods but I hope some day to have the opportunity of giving such.

Prof. Hall gives the thickness of the stratified aqueous rocks as 33 miles. However the whole known strata does not occur in any one place and even if such were the case it would be impossible to prove the thickness because no borehole could be put down to such a depth. The rocks of the earth's crust might be said to overlap each other like the leaves of a rose—the aggregate thickness is considerable but in no one place is this aggregate thickness to be found. In some parts of the earth some of the formations are absent simply because they were never deposited and never existed there. In other places they are absent because they have been denuded off. The aggregate thickness is approximately ascertained by measuring the thickness of one formation in one place; the thickness of another formation in another place, and so on. The aggregate is then found by adding up the various thicknesses.

To denude means to lay bare or expose, therefore denudation is the action of laying bare or exposing to view. In geology the term is used in connection with the action which wears down and destroys the rocks on the surface, thus exposing the older rocks beneath. Denudation (as I have already explained) is brought



about by the action of such agencies as flowing water, rain, ice, wind, the sea etc. The action is continually going on and when one layer of rock has been worn down the layer beneath is attacked and so on, in each case exposing an older layer. It is chiefly to the action of denudation that we owe the fact that any workable seams of coal exist, although it is due to the same action that many coal-fields have been entirely denuded off.

On the geological scale the coal measures are about six miles down, so if the whole strata existed it would be impossible to reach the seams and work them. However the whole strata does not exist in one place therefore we find seams not only at a workable depth but often right at the surface. The sketch shows an actual example of denudation in the Pennine Chain, England. The strata was once horizontal but it afterwards became folded and faulted. The strata were once all joined as shown by the dotted lines, but the top of the anticline has been worn off exposing the Carboniferous limestone. This limestone forms the Pennine Chain. On the west side we have the Cumberland Coalfield and on the other the Northumberland and Durham Coalfield. In the western portion of the latter the coal seams are found cropping out at about 1500 feet above sea level. In the eastern portion the same seams are found at a depth of over 3000 feet below the surface.

The student will have noticed that the grouping of the rocks in the geological scale is arranged according to the life that existed in each age. This grouping is arrived at by a study of the fossil remains found in the rocks. This study or science is known as "Palaeontology"—a branch of geology. The word is derived from the Greek—*Palais*—ancient, *onto*—beings, *logos*—discourse, therefore palaeontology is a discourse of ancient beings.

The word 'fossil' really means dug up, and the name was formerly applied to anything which was dug up from the crust of the earth. In geology the name is used in connection with the impressions of various plants and animals left in the rocks.

These plants and animals differed at different periods of the earth's history. In the oldest rocks only the simplest plants and animals existed, but as time went on the forms became more complex and it is easy to follow the changes which took place as these plants and creatures adapted themselves to the conditions under which they lived. For example the first trilobites at the bottom of the Silurian had no eyes, but in rocks of less age, say below the Carboniferous Limestone we find trilobites which had compound eyes. It seems to have been a case of the survival of the fittest, just as it is to day—adaptability to circumstances being the fundamental necessity for existence.

Some plants and animals had a wide range of existence and we find their fossils in rocks belonging to several periods. Most of them however had only a limited range of life and their fossils are confined to rocks of one particular period. These fossils are known as 'characteristic' or 'type' fossils and we can at once determine the age of any series of rocks when such characteristic fossils are found in them. Perhaps one of the most striking examples I can give is the limited horizon of the Ammonites in the Liassic rocks of the Cleveland district, Yorkshire, England, each layer or

bed of rock, often only a few feet thick, has its own particular type of Ammonite. As another example of type fossils I might mention such plants or trees as *Sigillaria* and *Lepidodendron* which are typical of the coalmeasures. Many more examples might be given but want of time forbids.

Being chiefly concerned in the geology of coal fields we will deal briefly with the formation of coal and the coal measures.

Coal is mineralized vegetable matter, more or less combustible, composed of carbon, hydrogen, oxygen, nitrogen, etc. Its structure often shows abundant evidences of vegetable origin and the associated strata are prolific with fossils, or impressions, of the plants which formed the coal. The change which has taken place during the passage from one stage to another has been the driving off of the volatile substances, leaving an increased per centage of carbon. The change has been brought about by heat, chemical action and the enormous pressure of the superincumbent strata. It occurs in the earth's crust as a regularly stratified, organically formed rock. A layer, bed, or stratum of coal is called a coal seam.

The general theory with regard to the formation of the coal measures is as follows:—At that time the conditions which existed were such as to favour the rapid and abundant growth of vegetation. The climate was hot and moist, and the atmosphere was heavily charged with carbonic acid gas ( $CO_2$ ). Under such favorable conditions dense forests of huge trees such as *Lepidodendron*, *Sigillaria* and *Sagenaria* flourished. Then there was the horsetails such as *Calanites*, and the groundgrowth such as *Sphenophyllon*, *Resiropteris*, etc.

This abundant vegetation flourished uninterrupted for a long period, and as old trees and plants fell others sprung up in their places until at last a considerable thickness of decaying vegetable matter had been formed. It is supposed that subsidence of the land took place and the forests became submerged and that deposits of sand and mud were laid down above the mass of vegetable matter. The sand and mud would afterwards become consolidated and form sandstone and shale, and the vegetable matter in time would become coal.

After one layer had been thus silted up another upheaval of the land took place and another period of uninterrupted vegetable growth, only to be submerged and silted up in turn when another subsidence took place.

This shows that each separate coal seam represents a submergence and upheaval of the old land surface. The above theory is known as the insitu theory, i.e. that the seams were formed on the site where the vegetation flourished. To support this theory we find the seams associated with regular strata of shale and sandstone, and often we find them underlaid by fireclay or seggerclay. The underclay or fireclay is supposed to be the soil on which the vegetation now forming the coal once flourished. Fossils known as *Stigmara* are often found in these underclays and they have been proved to be the roots of *Lepidodendron* and *Sigillaria*. This points to the truth of the theory.

(Concluded next issue.)

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F 4 52	4 52	1 1	1 1	Judique	F 9 45		
F 5 07	5 07	27 6	27 6	Catherine's Pond	F 9 22		
F 5 20	5 20	37 5	37 5	Port Hood	L 9 19		
A 5 33	5 33	47 4	47 4	Glencoe	A 9 10		
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F 5 58	5 58	54 4	54 4	G'endry	F 8 15		
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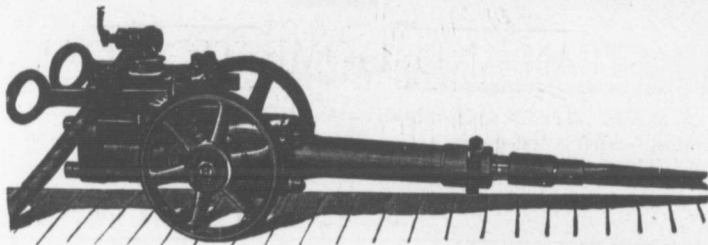
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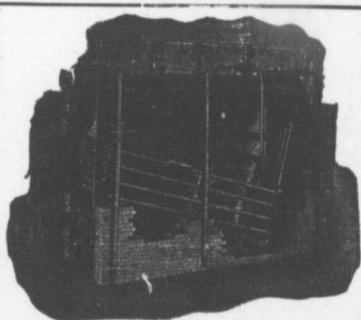
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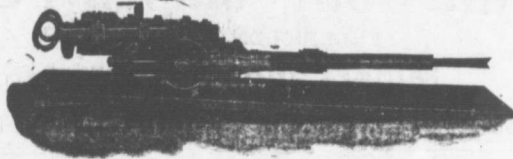
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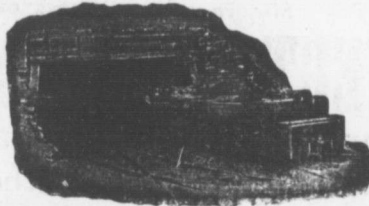
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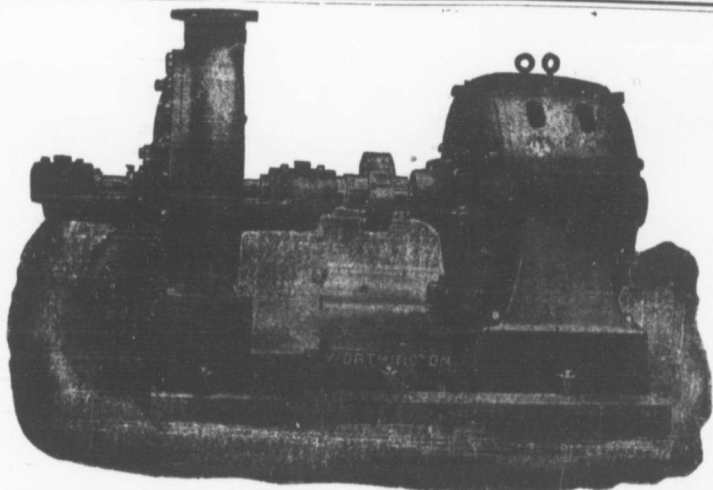
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