

JOURNAL  
OF  
THE MINING SOCIETY  
OF  
NOVA SCOTIA.

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VOL. IV.

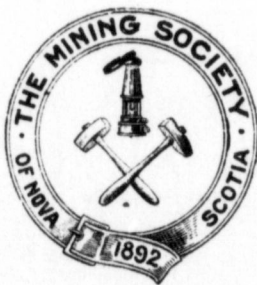
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BEING THE TRANSACTIONS OF THIS  
SOCIETY DURING THE YEAR 1898-1899.

THE TRANSACTIONS  
FOR THE YEARS 1895, '96 & '97, WILL BE FOUND IN THE  
JOURNAL OF THE FEDERATED CANADIAN MINING INSTITUTE,  
VOLS. I, II, & III.

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EDITED BY THE SECRETARY.



COPIES OF ALL THE SOCIETIES' TRANSACTIONS MAY BE  
OBTAINED ON APPLICATION TO THE SECRETARY

AT

THE ROOMS OF THE SOCIETY,  
HALIFAX HOTEL, HALIFAX, N. S.

"A Couple of  
(Paper)

"A Peculiar  
(Paper)

Additions to

Committee on

Annual Dinner

Election of

List of Members

Meetings . . .

"Mining and  
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OFF

MR. H. S. P.

MR. JOHN E.

MR. R. H. B.

MR. R. G. I.

MR. CHARLES

MR. C. A.

MR. W. L.

MR. A. A.

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MR. C. A.

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MR. C. F.

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FLETCHER, HUGH, B.A. Geological Survey Department,	Ottawa.
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Vice-Pr

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GUE, T. R.,  
GUFFEY, H.  
Manage

HAIGHT, HA  
HAMPSON, J.  
HARDING, E  
HARDMAN, J  
HARGREAVES  
Man. C

HAYWARD, A  
HOWARD, CA  
HOWE, C. FR

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Manage

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MATHESON, V  
MEISSNER, C.  
Genl M

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MORROW, W.

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MacDONALD,

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TRANSACTIONS OF THE MINING SOCIETY OF NOVA SCOTIA.

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WILSON, B. C. Superintendent Acadia Powder Co., Ltd.	Waverley, N. S.
WYLDE, H. M. Secretary Halifax Chrome Co., Ltd.	Halifax, N. S.



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## PROCEEDINGS.

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VOL. IV.

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## TRANSACTIONS

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### The Mining Society of Nova Scotia.

The Society as a body is not responsible for the opinions and views expressed in the several papers published in the Transactions.

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VOL. IV.

SESSION 1898-99.

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#### ANNUAL MEETING 13TH APRIL, 1898.

The annual meeting, adjourned from March 7th, of the members of the Mining Society of Nova Scotia, was held in the Halifax Hotel on 13th April. The proceedings opened at eleven o'clock in the forenoon, Mr. Charles Fergie, Vice-President, M. E., in the absence of the President, in the chair. After the minutes had been disposed of, the following were elected

#### NEW MEMBERS.

E. M. MacDonald, Pictou; Miner T. Foster, Halifax, N. S.; M. R. O'Shaughnessy, Waverley, N. S.; Robt. Archibald, Manager Can. Coal and Ry. Co., Joggins, N. S.; D. McAskill, Golden Group Mining Co., Montague, N. S.; G. F. McNaughton, New Egerton Gold Mining Co., 15-Mile Stream; Geo. E. Monroe, Westville, N. S.; Wm. O'Brien, Halifax, N. S.; J. E. Riley, Montreal; H. Guffey, Caribou Mines, Caribou; A. B. Cox, Isaac's Harbor.

On motion of Mr. F. H. Mason, F.C.S., Dr. Geo. M. Dawson, C.M.G., Director of the Geological Survey of Canada, was unanimously elected an honorary member.

MR. H. M. WYLDE presented the financial statement for the year, showing a substantial balance in favor of the Society.

MR. GEORGE STUART—I notice we have absorbed \$350 of the Government grant on current account. Have we any right to do that?

MR. WYLDE explained that the expenditure had been applied to maintaining the Society's reading room.

On motion of MR. B. T. A. BELL the report was adopted.

### COMMITTEE ON LEGISLATION.

The Chairman having asked for this committee's report, Mr. Willis explained that Major Leckie, the President, who was absent, had, he believed, prepared a report. As a matter of fact, beyond the bill of the Canadian Society of Civil Engineers, which had been killed at its second reading, there had been no legislation calling for the attention of the Society.

### THE CANADIAN MINING INSTITUTE.

The following letter from Mr. John E. Hardman, S.B., M. E., Montreal, was read:—

H. M. WYLDE, Esq., Sec'y.

*Dear Sir:*—In view of some of the sentiments which were expressed by some Nova Scotia members at the meeting of the Federated Institute in March last, and in view further of the completion of the proposed Canadian Mining Institute to a body corporate, it has occurred to me that the apparent misconception of the objects and purposes of the new Institute might be corrected by an explanation which I had hoped to have given verbally before your meeting, but which circumstances prevent me from attending, and I therefore ask you to read what follows to your business meeting before you come to the sixth item on your programme.

As has already been made public by the circular dated February 7th, and signed by the committee appointed for that purpose, the Federation was found to be deficient in its methods

of obtaining objects, which papers contained had to face

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of obtaining adequate funds for the proper carrying out of its objects, which were primarily, the printing and publishing of papers contributed by its members. Each year the Council has had to face a deficit.

The discussion of this deficit and the whole general question of ways and means occupied the attention of a large council meeting held on the 28th of January. Owing to the constitution of some of the constituent organizations of the Federation it was impossible to levy a greater contribution per capita than had been assessed. Furthermore, one organization was practically defunct, and another was so torn by internal dissension that its treasury showed only some \$40 of a fund. The matter demanded a thorough investigation of the results accomplished, and an intimate knowledge of the wishes and requirements of the mining fraternity of Canada as a whole; and for this reason it was referred to a committee. As your members will see from the printed report of that committee, they considered that the mining interests of Canada as a whole were paramount to those of any one section or province, and they deemed the time propitious for organizing, upon a somewhat broader basis than the Federation, an Institution which should represent the mining interests of the whole Dominion. And this, without wishing or desiring to affect the standing or existence of such provincial societies as were in good circumstances and were necessary as safeguards upon matters of provincial legislation. They furthermore desired that the classification of members into different groups should be somewhat of a qualification or registration of such members' professional standing, this being particularly urged by members from Ontario and British Columbia, which provinces have suffered far more than the eastern ones from the incompetency of the men engaged in the mining business; it was, however, quickly found that this was impracticable at the present stage of Canada's progress as a mining country, and this idea was abandoned.

The chief value of technical organizations has always been found to be in their literature, as is well evidenced by the large organization of the American Institute of Mining Engineers.



and the large membership of the Institution of Mining and Metallurgy of London, and others. To make the literature of the Canadian Mining Institute successful required only a sufficiency of funds, as the publications of the Federation are sufficient evidence of the ability of the members to make such literature, and the Treasurer's statements are equally evidence that the Federation did not possess funds enough at its disposal to remain a solvent concern.

Moreover, it is apparent to those who have watched the progress of Canada in mining matters during the last three years, that a professional man may this year be engaged in Nova Scotia and next year be developing a mine in British Columbia, and the reverse. Instances of this are too numerous to require mention, and as a consequence many members of the Federation were constituent members of two or more provincial organizations, and paying from \$20 to \$25 and \$28 per year for their membership. From this constantly increasing class of members came a strong expression or desire for a Dominion association and a workable organization.

Having all these requirements and wishes in view, the committee before referred to (of which I had the honor to be chairman) proposed an organization on the lines along which the present Canadian Mining Institute was formed.

As the head of that committee, and as the President of the new Canadian Mining Institute, I strongly desire to represent to the Mining Society of Nova Scotia (with which Society I feel myself strongly identified) the complete absence of any intent, on the part of either the committee or of the Institute, to supplant in any way the provincial work of the Mining Society, or to in any way interfere with its autonomy. We have felt the need of a large and strong Canadian organization, to represent Canadian mining interests and to look after the proper development and progress of the large mineral districts of our Dominion, and we feel that such an organization can exist beneficially to the country without in any way being antagonistic or prejudicial to such provincial organizations as may desire to continue distinct and separate. We feel further-

more that the provinces, strengthens and demands developing investment Ontario, and in favor of a combination of

The history of Nova Scotia shows that if necessary the welfare of the province is watching its discontinuance of its advantages, whole, of the mining industry

We have of the Mining Society interested in and for such meet them a advancement

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On motion of vote of thank Intercolonial courtesies ex Montreal.



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more that the interchange and commerce between the different provinces, which is growing greater and greater each year, strengthens the demand for such an Institute as has been formed, and demands an affiliation of those men principally engaged in developing and exploiting the mineral interests of Canada. The investment of Montreal capital in the mines of British Columbia, Ontario, and Nova Scotia, only adduces another argument in favor of a broad guage representative body as against a combination of narrower and more sectionalized interests.

The history of mining legislation both in Quebec and Nova Scotia shows the need of a representative body to watch, and if necessary, combat, such proposed laws as are inimical to the welfare of its industries. There may still be need of such watching in Nova Scotia, and I should be the last one to advise its discontinuance; but at the same time I can recognize the advantages, both to the individuals and to the country as a whole, of an incorporated body which is representative of the mining industry of the whole Dominion.

We have room in the Mining Institute for all of the members of the Mining Society of Nova Scotia who feel that they are interested in the welfare of mining throughout the Dominion, and for such who have no such interest we feel that we can meet them and perhaps work with them in the conservation and advancement of provincial interests without prejudice.

I beg to convey my cordial good wishes to the Society in meeting assembled, and to remain, dear sir,

Yours very truly,

JOHN E. HARDMAN,  
*President, The Canadian Mining Institute.*

#### THANKS TO THE INTERCOLONIAL RAILWAY.

On motion of Mr. Wylde, seconded by Mr. Bell, a hearty vote of thanks was tendered to the passenger department of the Intercolonial Railway, and to Mr. Price, its representative, for courtesies extended to members during their recent visit to Montreal.

## THE SOCIETY'S ROOMS.

MR. STEWART asked why the meeting was not being held in the rooms of the Society.

THE CHAIRMAN—It is not large enough. Mr. Poole and Mr. Meissner had been looking about for more suitable accommodation.

MR. MEISSNER—The room we have now is excellent, as far as it goes, but it is very small. I have no doubt better accommodation could be obtained for less money.

MR. BELL suggested the proper place to have the Society's rooms should be the Halifax Hotel, where more of the mining men of the province were to be found from time to time, and he suggested that the proprietors be seen.

MR. MEISSNER thought the suggestion a good one.

Messrs. Poole and Meissner were delegated to make enquiries, and report to the afternoon session.

Messrs. Willis, Mason and the Secretary were, on motion of Mr. Bell, appointed a library committee.

MR. C. E. WILLIS read a paper entitled—

## A PECULIAR LODE FORMATION.

While prospecting in the Gold River district, Nova Scotia, in 1887, I discovered on the bed rock under about eight feet of surface drift, a small piece of quartz weighing exactly two pounds, from which I mortared 16 dwts. of gold. I immediately started in to discover the lode from which this boulder came, but it was not until three years afterwards, and after a very large amount of heavy prospecting by myself and others, through surface ranging from eight to twenty-two feet in depth, that I was finally successful in locating the vein about 700 feet north of the place where the first boulder was found. During this prospecting many rich boulders were discovered, and I think not less than 40 or 50 ounces of gold were obtained in this way. At the point of discovery of each of these boulders stakes were driven, and after the lode was cut these stakes were seen to be

Photograph of fragment of "Vermillion Lode" and contorted strata.

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Photograph of fragment of "Vermillion Lode" and contorted strata.





in a straight line from the point where the first boulder was found, to the point where the lode was opened, proving in a very conclusive way the direct course taken by this glacier which ground off this lode. This is the more noticeable, taking the distance into consideration, the depth of the surface, and the fact that about one-half of the distance was along the slope of a steep hill. I think there can be no doubt that the place at which the lode was cut, was the exact point from which all the boulders were originally derived. Accompanying each boulder, with the exception of the first, was quartz from another lode, averaging about nine inches in thickness, and so highly colored by oxydation of the pyrites, that the lode was named "The Vermillion" even before the discovery. By reference to the sketch it will be seen that this large lode was separated from the rich one by about four inches of grey slate.

It was of no value, and I think but two small nuggets of gold were found in it, and the quartz was thrown on the dump. The rich lode was of a most peculiar and unique character, in size from three-quarters of an inch to two and one-half inches in thickness, inclosed in about six inches of black slate, the slate being totally different from anything found in the district. Both the slate and quartz are contorted and folded in a most remarkable manner, as can be seen by the specimens which I herewith submit for your inspection.

The contortions of the vein are conformable with corrugations on the quartzite foot wall of the belt at point *a* on sketch, which at point *b* on the other side of this small band of slate, there is no sign whatever of this corrugation, nor does anything of the kind show at *c*, *d*, or *e*. I have seen in other places corrugations of the strata, but always I think in slate belts, and nowhere on a quartzite wall, neither have I ever seen such deep and sharp corrugations as in this instance.

In bringing this unusual lode of formation to your notice, I desire the opinion of the gentlemen present, as to how this belt of slate with the enclosed lode was originally deposited, as after forming several opinions myself, I have come to the conclusion that I am entirely unable to figure it out. One of the

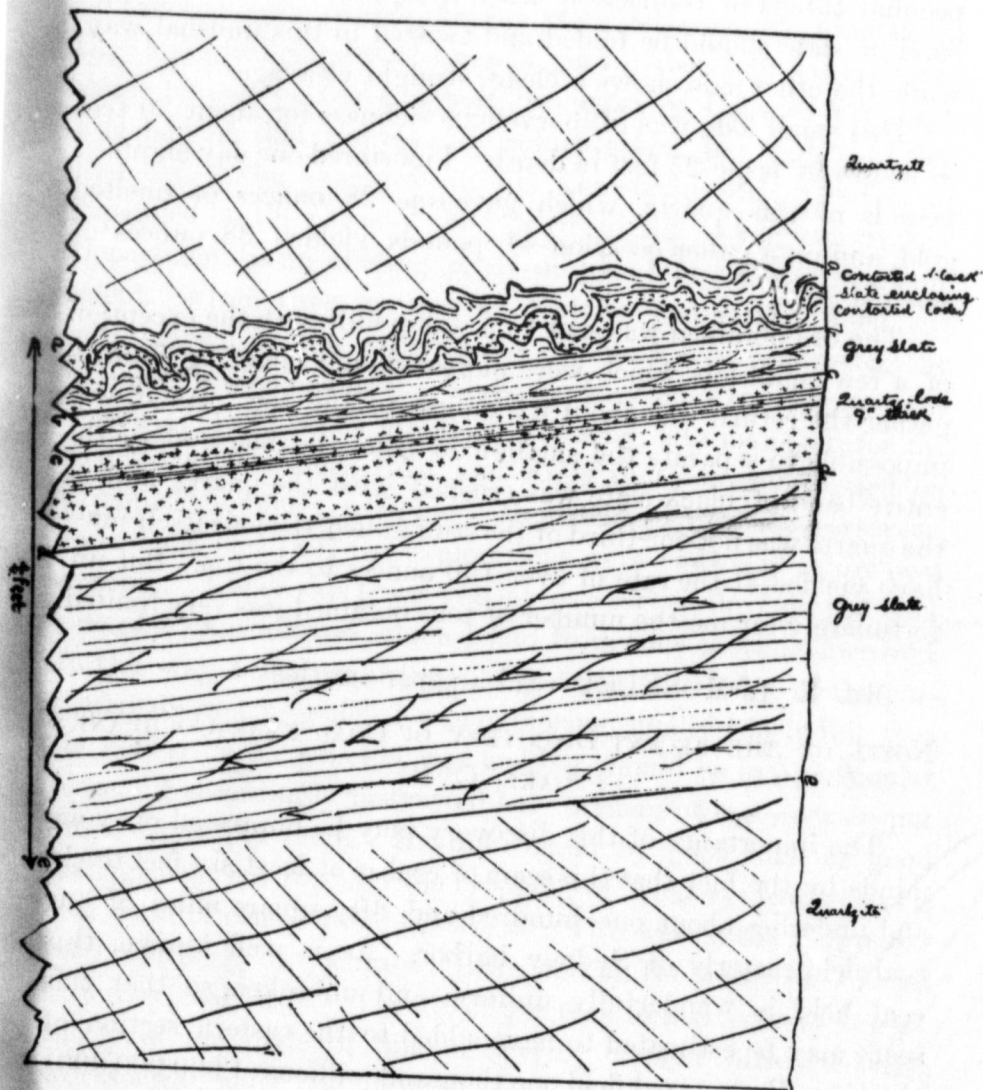


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peculiar things in connection with it is, that one side of this band of slate should be folded and twisted in this unusual way, while the other side shows a clean, straight cleavage.

This small lode was of marvellous richness for about 30 feet in length by some 25 feet in depth; I mortared one day eighteen pounds of this quartz, which gave me 28 ounces of smelted gold, and on another occasion 41 pounds yielded 38 ounces of smelted gold.

The ore obtained was sent to a stamp mill with the exception of a few small lots which were mortared, and counting it altogether the return was about 62 ounces to the ton. As it was impossible to separate the small lode from the black slate, the entire band of black slate was crushed with the quartz, and as the quartz was not one-third of the stuff milled, the lode itself must have yielded at the rate of over 190 ounces to the ton. But unfortunately for me the number of tons obtained was very limited.

MR. E. T. MOSELEY read a paper entitled—

#### NOTES ON THE RECENT DISCOVERY OF COAL NEAR COCHRANE'S LAKE, C. B.

The importance of this discovery may be impressed on your minds by the fact that this seam of coal is at least six feet thick, and underlies about one hundred and fifty square miles of our coal field easterly of Sydney harbor. As is well known, this coal field is wonderfully uniform and unbroken, so that this seam may be estimated to have added to the eastern section of the Cape Breton coal field one thousand millions (1,000,000,000), tons of coal.

Patient, exhaustive and expensive explorations had from time to time been made by various persons, in hopes of discovering this coal seam,—by Prof. Lyman, in behalf of Marshall Bourinot, by Mr. Mills, a Mining Engineer, in behalf of some American capitalists, and by many others, but without success, until it was my own good fortune to be successful where so many others had failed. In making this discovery, I do not assume undue credit, because Mr. Poole, (father of Mr. Poole, one of the members of your Society), and Mr. Brown, (father of another of your

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members), had years ago formulated theories about the location of this coal seam, which theories were subsequently adopted by the Geological Survey of Canada, and elaborately worked into shape by one of the foremost geologists of Canada, Mr. Hugh Fletcher, of that Survey. I cannot speak too highly of Mr. Fletcher. The exactness of his knowledge and research, as expanded on the pages of the reports of the Geological Survey Department, is an abiding proof of his ability and professional talent. From time to time Mr. Fletcher had kindly aided me with advice, in the explorations which I was conducting by means of a diamond drill. Those explorations extended over the season of 1895, when Mr. D. J. Kennelly, late manager for the Sydney & Louisburg Coal and Railway Company, carried on explorations jointly with me. Mr. Kennelly did not persevere, so in 1896 and 1897 the explorations were continued at my own expense. I may say I was getting experience through the considerable expenditures which I had from time to time incurred. In this way I was acquiring a very exact knowledge of the particular district in which I was exploring, finally concluding that the coal seam for which I was looking should be in a particular place. I accordingly instructed the foreman of my work to put down a test pit there. He did so, and by good luck or good management cut through the cropping of what evidently was a coal seam of considerable thickness. This was on the Fergusson road, southerly of Cochrane's Lake, and on the south rise of the Cow Bay coal basin. The dip of the rock in that vicinity is northerly, at an angle of one in seven. I next instructed the workmen to move one hundred feet northerly, and to put down the diamond drill through the coal seam. In due time they did so, and this is the record of the result:—

	Feet.	Inches.
Top coal . . . . .	0	9
Shale . . . . .	0	4
Coal . . . . .	5	5
Mixture . . . . .	0	0½
Coal . . . . .	0	3½
Coal and clay . . . . .	0	11
Coal . . . . .	0	4
	8	1

I then instructed the men to move the drill one hundred feet further northerly, and bore through the seam. In due time the work was done, the result being as follows:—

	Feet.	Inches.
Top coal .....	0	11
Clay .....	0	2½
Coal .....	5	0½
Clay .....	0	7
Coal .....	0	10
	7	7

I had told Mr. Fletcher that when I had any important information to impart, bearing on the economic interests of the coal field, I would write him. I did so, and he kindly came to Sydney to investigate the discovery. For his information I had a shaft sunk. He waited at Cochrane's Lake while the shaft was being sunk, then measured the seam, and kindly communicated the result to me, which was as follows:—

"In the shaft I measured five feet six inches of clean coal of good quality. Immediately overlying this was a black streak, probably representing the upper bench of the bore holes, but not well defined, owing to the want of a solid roof."

I may add that I have had analyses of the coal made, giving excellent results. As a gas coal, it is admitted to be the best in the coal field. It makes an excellent coke. One of the analyses, made by Mr. McCallum, Analyst for the Dominion Coal Company, at their office at Glace Bay, is as follows:—

Volatile matter.....	38.45 %
Carbon .....	55.80
Ash .....	5.75
Organic or combined sulphur.....	2.01

This analysis is of coal taken from a heap on the surface at the Fletcher pit. I expect that an average analysis of the seam farther to the deep will give even better results.

I think this discovery must be admitted to be of a great economic importance, so far as our section of the country, and the Province generally, are concerned. Without expressing any

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opinion against the Dominion Coal Company, with many of the shareholders of which I am on very friendly terms, the fact must be admitted that the tendency of that company was in the direction of monopoly. I think it will be admitted that monopolies are usually not popular with the masses of the people, and, generally, not beneficial either. From this out, there can be no monopoly as far as the Cape Breton coal field is concerned. Enough coal is now known to exist outside of the Dominion Coal Company, in the eastern Cape Breton coal field, to justify the organization of several coal companies and the working of several collieries. I myself am trying to organize coal companies, and hope before long to be quite successful.

#### DISCUSSION.

MR. BAIRD: I hope it is not a pocket you have struck. You seem to have only followed it in one place. Have you tested it for any distance?

MR. MOSELEY: I consider that I have struck the Mullins coal seam. I have cut it four times myself, twice by pits, and twice with the diamond drill, and I believe that I can readily find this seam at almost any other part of the coal field. I may say that the Mullins coal seam was originally opened on property which at that time belonged to the General Mining Association, and at a place just southerly of the Victoria Mine. It is six feet thick on the farm of one McGillivray in that locality, where the Dominion Coal Company ran a slope 145 feet to the deep. The Mullins seam has been traced, to the satisfaction of those who understand such matters, from the shore of Sydney Harbor to Carroll's Hill, near the shore of the head of Bridgeport Basin. The coal there is about the same thickness. It has also been found on the southern side of Bridgeport Basin, on the farm of one Lynk, where it dips south-easterly under the measures of the Glace Bay coal basin. I was present with Mr. Fletcher when he measured the coal on the Lynk farm and found it to be six feet thick. The seam was not found to my knowledge in any other part of Glace Bay or Cow Bay coal basins



until found by myself. Those coal basins are so very regular that it may be assumed that it underlies, first, the Glace Bay basin, until it comes under the influence of what is called the North Head anticline; this anticline runs inland, it was thought at first for only a few miles, but in the course of my explorations I found it many miles inland; the seam then underlies the Cow Bay coal basin, in which I found it at Cochrane's Lake.

Exploring for this seam in the winter of 1895, I had a deep boring put down near the summit of the anticline. Mr. Fletcher, who was taking a deep interest in my work, advised me that when I got down 450 feet I would in all probability find the coal seam. Unfortunately, at 400 feet down one of the diamonds dropped out of the bit, and my workmen could not recover it. When they tried to use the bit the lost diamond cut grooves in the steel bit just like one would cut chalk with a knife. We had thus to abandon that boring while so near the goal, and I have not been able to get down the extra fifty feet, but I have such confidence in Mr. Fletcher's opinions that I am determined to get there somehow before I am much older.

I am strongly of opinion that what I found is the Mullins coal seam in the Cow Bay coal basin. It may be the same as the Tracy seam; I do not express a very strong opinion upon that point just now. I think, however, that the probability is that the Tracy is an underlying seam. I will know all about that question later on, since I expect that some of those with whom I am dealing in connection with the formation of companies may be carrying on extensive explorations shortly.

In estimating quantity, I take Mr. Fletcher's map, which has been very carefully prepared, from actual surveys. I calculate on this map that about 150 miles of the eastern Sydney coal field are underlaid by this Mullins seam. Each square mile contains, approximately, six to seven million tons of coal, so the 150 square miles should contain one thousand million (1,000,000,000) tons, the figures above mentioned.

MR. FERGIE: Calculations of coal in any area are very problematical, but I have no doubt that your find is very valuable. What size of diamond bit did you use?

MR. MOSELEY

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MR. MOSELEY

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MR. MOSELEY : One and five-eighths ( $1\frac{5}{8}$ ) inch.

MR. FERGIE : What was the cost ?

MR. MOSELEY : When I commenced working, the average cost was \$2 per foot of rock bored, but at the last work, my men as well as myself having gained experience, the cost was reduced to one dollar per foot. I used the "Bravo" drill, made by the M. C. Bullock Manufacturing Company of Chicago. Either hand or steam power may be used ; I found hand power the most satisfactory up to four hundred feet. For a 1,000 feet boring a larger drill would be required.

MR. BROWN : I am glad to hear that there is a possibility of this field covering 150 square miles. It will be good for the Dominion Coal Company as well as the General Mining Association, as the seam must underlie our areas,—of course at very great depth, probably 2,000 feet on our property, but in England, however, they are working 4,000 feet in depth.

#### ELECTION OF OFFICERS AND COUNCIL, 1898-99.

The following were elected for the ensuing year :

##### *Past Presidents.*

- MR. H. S. POOLE, M. A., A. R. S. M., (Acadia Coal Co.) Stellarton.
- MR. JOHN E. HARDMAN, M. E., Montreal.
- MR. R. H. BROWN, M. E., (Gen. Mining Assn. Ltd.) Old Sydney Mines.
- MR. R. G. LECKIE, Sudbury, Ont.

##### *President.*

- MR. CHARLES FERGIE, M. E., (Intercolonial Coal Co.) Westville, N. S.

##### *Vice-Presidents.*

- MR. C. A. MEISSNER, (Londonderry Iron Co.) Londonderry, N. S.
- MR. W. L. LIBBEY, (Brookfield Mining Co.) N. Brookfield, N. S.
- MR. A. A. HAYWARD, (Golden Group Mining Co.) Halifax.

*Honorary Secretary.*

MR. B. T. A. BELL, Editor Canadian Mining Review, Ottawa.

*Secretary-Treasurer.*

MR. H. M. WYLDE, Halifax, N. S.

*Council.*

MR. C. ARCHIBALD,

MR. F. H. MASON,

MR. CLARENCE DIMOCK,

MR. W. A. SANDERS,

MR. JAMES BAIRD,

MR. GEOFFREY MORROW,

MR. C. F. ANDREWS,

MR. J. H. AUSTEN,

MR. GEORGE W. STUART.

MR. FERGIE very briefly thanked the members for the honor they had done him in electing him to the presidential chair, after which the morning session adjourned.

*AFTERNOON SESSION*

The members having re-assembled at three o'clock, the President in the chair, MR. B. C. WILSON, Waverley, read the following paper—

SHALL WE HAVE A NEW MINES ACT RELATING TO MINES OF GOLD AND SILVER?

Next to having valuable mines, efficient management and equitable laws clearly defined and properly administered are necessary elements toward success and reputation.

The first we have. The management I do not propose to call in question now, but to our mining laws, so far as they apply to "Mines of Gold and Silver," I beg to call your attention.

The first statutes relating to our Gold Mines date back to the early sixties, and their then primitive crudeness can be excused, but from that time to the present we have never had a thoroughly revised or out and out new "Mines Act," but almost

every year an expert to culture, and it judges—could libellous to ch by disregard a annual amend that the unfo questionable p the best of his physical force—the assessment statutes are det

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every year amendments have been tacked on till it would puzzle an expert to define which was "patch," or which original structure, and it appears now as though no judge—or rather no two judges—could agree upon its definitions, and I trust it is not libellous to characterize it as conceived in ignorance, perpetuated by disregard and fostered by litigation, and so complicated by annual amendments (I think three or four were added this year) that the unfortunate lessee seems to have obtained but the questionable privilege (through his lease) to resist all comers to the best of his ability—whether by invoking legal process or physical force—provided always that he has promptly paid all the assessments of rents and royalties. On this point the statutes are definite.

In making the foregoing arraignment I offer no criticism on the Government, or on those appointed to administer the law as it stands.

It is not only exasperating and annoying to our people interested in the industry, but it has also a very deterrent effect on capital, without which our mines can never be properly developed, and the changes and amendments in the Act are so numerous; so overlap and nullify each other that about the only certainty about the statutes is their uncertainty and indefiniteness.

To illustrate a minor discrepancy, let me ask what is the legal size of a gold area. The answer is probably and promptly 150 by 250 feet. Without stopping to discuss the advisability of so small an area, let us investigate a little.

The writer can well remember when 50 by 50 feet constituted a gold claim—he having owned several of that size—but I believe these have all lapsed or ceased to have any legal status.

The next size adopted was 140 by 240 feet, and there are hundreds of these areas existing yet in some of the older districts—as Tangier, Waverley, Goldenville, and others, and on which our paternal Government exact the same 50 cents per year rental as on the later standard of 150 by 250 feet. In still other districts spaces or roads of 30 feet wide, or thereabout,

were left between every two tiers of lots, ostensibly for the purpose of enabling parties to reach their areas without trespassing on their neighbors' ground. These spaces or roads were not granted or leased, but were considered as public domain on which the owners of adjoining lots *might* trespass if sufficient inducement offered.

In course of time some observant student of mining geography investigated these new roads to possible fortune, and applied for a mining lease of the same, causing some stir among adjacent owners. I am not prepared to state just how it now stands, but you can conceive what a conflict of interests might arise.

The next legal standard was the existing one of 150 by 250 feet.

It might be pertinent to observe here that these areas are too small, both for the price charged and for economic operations, and it is not competent to reply that a person may apply for a sufficient number of these small areas to make a "large farm," for it is not the occupier of large lots, but the fellow who plants down a solitary area here and there that blocks the way by emulating the dog in the manger; neither toiling or spinning himself but taking advantage of the energy of others; demands an exorbitant figure under the penalty of rendering the efforts of his more enterprising neighbor abortive unless his demands are acceded to. And who so poor that he cannot raise 50 cents to checkmate his brother rather than develop his own territory?

This limited reference is sufficient to draw attention to discrepancies in the law. To enumerate all of which, and to their logical influences, would cover more pages, I believe, than does the lengthy Act on "Mines and Minerals."

The questions which result are:

1. The remedy.
2. Is it worth the effort?
3. Who shall inaugurate it?
4. And when and how?

I believe the two latter will prove the stumbling blocks.

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The writer has had some experience recently in getting a new "Road Act" framed and put through the Legislature.

For years the municipal council of Halifax County has been discussing the question and urging the Legislature to legalize some system of road reform. We memorialized, suggested, interviewed, and "resolved" without avail. Then we narrowed it down by asking its application to Halifax County only. This was more favorably received, and we were asked to submit our views, which we did, and left them with the powers that were, to be framed into suitable legal phraseology and presented to the House. It passed its first reading, when we had the first opportunity of seeing how our "infant" looked. We simply did not know it at all, and after consultation were glad to withdraw it.

We next appointed a committee, clothed with power to engage legal ability, and to formulate an Act. We were not long in discovering that ordinary "committee work" did not amount to much, hence we came down to the practical, engaged a person to act on instructions from the committee, to send out circulars and enquiries to the several councillors and others known to be interested, or who had practical ideas to offer, and after getting their several views to edit and combine them into a presentable document, had our legal luminary revise and condense and make acceptable and presentable to our law makers, with the result that we got up an Act acceptable to the council, and which stood the criticisms of both branches of the Legislature and passed with hardly an amendment.

I have offered this digression merely to ask if there is not something indicated therein as to what is wanted or might be done towards compiling a new mining law.

The Government has frequently advised this Society to define its views on reform, and they would endeavor to meet us in the most friendly attitude, and it is no doubt within the memory of many here how we "moved" and "resolved" and appointed committees, who presumably got in their "committee work" and who probably made some good suggestions, which we will infer were handed over to be engrossed, etc., etc., but we all

know about how much has come out of it; and the question now is, shall we make any further effort or just go on trusting to luck, and let "Old Nick" take the hindmost?

I think you will agree with me that the frequent amendments are simply short cuts out of difficulties which continually crop up and which might have been provided against if due consideration had been given in the first instance, while it must be equally patent that this piling up of complicatory amendments is very far-reaching in its effects, and it may take many years and perhaps involve much capital to eliminate these stumbling blocks of patchwork legislation.

Well! The remedy? And whence it is to come or be inaugurated? From the Government? Hardly, I think; for under the present application of rents, royalties, leases and prospecting licenses, with no liability for errors of omission or commission, no cost even for collection and hardly for surveys, it is quite evident that the Government has a "fine milch cow," and on the principle of "leaving well enough alone" can hardly be expected to disturb the goose that is laying the golden eggs. And seriously put yourself in their place—would you do it?

No amendment to the existing statute will mend the case, which, like the repairs to the Indian's gun, needs a new lock, stock and barrel, in short a *new Act*.

To thoroughly investigate, digest and prepare a reliable presentable Act will require all the time available between now and the next meeting of the Legislature, for it is not to be accomplished by a few hurried committee meetings: some *one* must give time and attention to it, hundreds of circulars should be sent out to every miner, capitalist or others interested in gold mining, getting their views and suggestions, all of which in turn will have to be considered and edited; legal talent will have to be employed to sift and arrange, and the conferences with the Government will be in order to see how much "give and take" has to be introduced, and then again the whole code dressed into shape.

In such a way I have confidence a clear, concise and intelligent statute could be produced, one which would eliminate

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much of the present indefiniteness and complications, and materially lessen the intervention of the law to define what the statute means: one which will bring the whole code up to date, relieved of the many conflicting and obsolete clauses which are occasionally drawn from their well-earned repose to serve purposes of legislation, delay, and possibly some personal motive of not the highest moral order.

It is well to consider, however, that preparing such an Act is not going to be plain sailing by any means. Nearly every amendment now on the statutes, even already repealed, has at different times and ways created vested rights which have to be respected, in fact can only be hedged about, or perhaps eventually wholly or partially eliminated by effluxion of time under the introduction of some element of revision which will make it the interest of those interested to surrender their claim in lieu of the benefits the new regime may provide. And just here I might throw out the suggestion of an Act dealing exclusively and individually with mines of *gold* and *silver* as separate and distinct from other minerals, as it would simplify the Act and avoid conflict and necessary reference to that oft-repeated expression in the existing statute of "mines, other than gold and silver."

Now, who is to do this? Not the Government, for as before remarked, this "milch cow" furnishes her own provender, and the Provincial exchequer enjoys the milking. And seriously, we could not expect them to frame an acceptable mining law. In the nature of things they can criticise, but not being practical mining men, they know not the difficulties and obstacles which man and nature joined strew in the path of the gold miner; in fact certain of them are debarred by statute from obtaining that valuable experience which comes through a financial investment in a gold mine.

Who will furnish the means? My experience referred to warrants me in saying it will cost \$400 to \$500 to get up such an Act as the exigencies demand, and this not for the time and talent of the committee, but for legitimate charges, expenses, labor and legal ability.

The Government might furnish a portion. It would not be judicious to permit them to furnish it all, else results might be as with our Road Act "infant"—we not being able to recognize it. We, the gold mining men of Nova Scotia, want a big say in the framing of such an Act, hence should not compromise ourselves for a handful of dollars.

I might just say the elimination of one law suit, or the "tribute" levied by the selfish holder of a "solitary" area in a block would be more than sufficient. But then as to these contingencies each one fondly trusts he will not be the "hindermost" in that race.

Question again! "Is it worth the candle?" It is! Then I may quote in full Dean Swift's short charity sermon: "If you believe in the security, come down with the dust."

If a new revised mining law applicable to our gold mines is desirable, then *gold mining men* must put their collective shoulders to the wheel and *they* must come down with the dust.

#### DISCUSSION.

MR. W. L. LIBBEY—I do not believe anything can be done with the Mining Act until it is taken hold of by some first-class lawyer who knows the needs of miners. The Act will have to be revised from beginning to end with the aid of all the suggestions that can be made available.

MR. A. C. ROSS—If anything is to be done in that line this would be an opportune time, as the statutes are being revised, and the revising committee should have the assistance of some mining men when they come to the Mines Act.

MR. G. W. STUART—I agree with Mr. Ross.

MR. B. C. WILSON—If the matter is put off till the autumn we will practically get nothing done. We will need money, as I know from my experience in the small matter referred to: five hundred dollars at least will be required. An Act will have to be framed which will not only be acceptable to miners, but also to the government, who are interested in the revenue obtained from the mines. It is important that we get the

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opinions of everybody interested in gold mining, and I know of no better plan than to send out copies of the Act, and ask individuals to give their respective opinions, and then with some persons to properly revise and edit them you would soon get them into shape. It is going to take some time and some money, and it depends on our gold mining men, because I think that the Mines Act so far as it relates to coal and other minerals is very nearly what is desired. If we do not take the initiative the government never will. Place ourselves in their position. would we do it? If we make complaints they say: formulate what you want and we will be pleased to meet you.

MR. HAYWARD—Why not appoint a commission to carry the thing out?

On motion of Mr. Hayward, seconded by Mr. Partington, the following gentlemen were appointed a commission to take the evidence of miners, in accordance with the suggestion of Mr. Wilson: Messrs. Wilson, Franklyn, Libbey, Stuart, Hayward, and Poole.

MR. ROSS—I think the government will favor a commission, on account of the fine questions which have arisen in regard to metals associated with gold.

MR. HAYWARD—I would like to have the Society empower that commission to use the necessary funds for that investigation.

MR. LIBBEY—It is perhaps more largely for the benefit of the gold miners, and I don't think we could burden the Society with the expense.

MR. STUART—Would it not weaken our position with the government to have this enquiry confined to gold? We will strengthen our hands by having all mining interests represented.

MR. POOLE—The Society could vote a certain sum, to be supplemented by private subscriptions of the gold men.

On motion of Mr. Hayward, seconded by Mr. Hampson, the sum of fifty dollars was appropriated from the funds of the Society for the purposes of the Committee.

On motion of Mr. Libbey, the Committee was made applicable to the general mining interests of the Province, and the

names of Messrs. Harvey Graham and Clarence Dimock were added thereto.

#### ADDITIONS TO TARIFF FREE LIST.

MR. BELL—I would like to submit a question of tariff which may be interesting, namely, the desirability of adding chrome and manganese steel shoes and dies to the free list. The government would be pleased to have suggestions as to additions to the present free list, and every gold miner will agree with me that these articles should be put on.

MR. WILSON—I understand that parties are mining manganese in New Brunswick and carrying it to Ferrona to make steel. Would not such a motion conflict with that industry?

MR. LIBBEY—Are you not looking after the interests of a child not yet born? I will take shoes and dies from any man who will say that his are as cheap as anybody else's, even if they are not as good as the Brooklyn chrome shoes and dies.

MR. AUSTIN—Speaking of goods not on the free list reminds me that brattice cloth is omitted. That is not made in the country, and is not used for any other purpose than mining. I would like to incorporate brattice cloth in it.

MR. PARTINGTON—Why not add tappets and cams?

On motion of Mr. Sanders, seconded by Mr. Libbey, it was resolved: That the Society, through the President and Secretary, memorialize the Dominion Government to add to the present free list the following articles of mining machinery:—

(a) Chrome and manganese steel shoes, dies, cams and tappets for stamp mills.

(b) Brattice cloth for colliery purposes.

(c) Ventilating fans for collieries and blast furnaces.

MR. A. A. HAYWARD then presented a paper on

#### RAPID SINKING IN A NOVA SCOTIA GOLD MINE.

Just as there are many causes assigned for the continued depression and lack of confidence in the metalliferous mines of this Province, particularly those of gold, so there have been from

time to time economical and having more or less believe in the ultimate natural resource in many legitimate line that would and investing in valuable theories many of them possess less knowledge of we are to select from mine.

There are, however, without grave fear to the most inexperienced to-day, instances result in characterize so many products.

Let us concentrate line which has for its economy: and when obtained are compared methods, two questions those who are desirous will compare more fairly.

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While not offering means we are to obtain only a few facts which from the observed process.



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time to time equally as many theories advanced for the more economical and extended development of these mines by persons having more or less knowledge of the situation, and who firmly believe in the ultimate success and final recognition of the valuable natural resources which present themselves to the investigator in many localities, and which, if developed along proper and legitimate lines, would place many of our mines in a position that would entitle them to recognition by the thoughtful and investing public. But just what combination of these valuable theories—for they are all more or less valuable, as many of them possess an element of sincerity and a more or less knowledge of the present situation and its requirements—we are to select for our guidance, it may be difficult to determine.

There are, however, lines along which we may advance without grave fears as to the results; lines which are familiar to the most inexperienced, and which, although comparatively indistinct to-day, if persistently followed, would, in many instances result in success, instead of the failures which characterize so many promising mining enterprises.

Let us concentrate our thoughts for the time, along a single line which has for its inspiration but two objects, viz., time and economy: and when the results desired and but only partially obtained are compared with those previously obtained by other methods, two questions must naturally suggest themselves to those who are desirous of placing this industry on a footing that will compare more favorably with other channels of investment.

Are we, as a mining community, obtaining the best possible results with the finances and mechanical appliances at our disposal; and if after careful investigation, it is found we are not, then along what lines should we at first proceed if we are to obtain a greater degree of efficiency and satisfaction both to the investor and ourselves?

While not offering any suggestions as to how and by what means we are to obtain the best possible results, I beg to record only a few facts which are deduced from my own practice and from the observed practice of others during the past fifteen

years, trusting that such facts may be sufficiently convincing to the most enthusiastic admirer of old times and old time ways, that we are not obtaining the best possible results with the means at our disposal.

Previous to the year 1884, and in many of the mines since that date, the motive force employed in drilling has been manual labor with all its attending disadvantages. Ignorance on the part of the owner and prejudice among employees has in many instances prevented, and is still preventing, the introduction of modern mechanical appliances for rock-drilling. Appliances that have been attested and successfully used in mining operations in other countries under the most varied conditions; while in this Province shafts are being sunk, cross-cuts and headings driven, up-rises driven, winzes sunk, under the same conditions that have existed for years, while hundreds of tons of ore have been, and are still being stoped, some at a profit and much at a loss. New mines are continually being added to the long list with records of failures and successes; some have appeared above the mining horizon with extremely bright and brilliant prospects, but their stay has been short—closed down, and why? In many instances because the ore would not pay for its development and production under the existing methods. Others again have appeared and have left behind them a more successful record—and why? Because in many instances, the ore being of exceedingly high grade, the mines could stand any reasonable amount of unnecessary expense: the manager was able to keep the expense account within the limits of income, and so it was pronounced a success, and to-day the abandoned dumps are pointed to as monuments of great mining successes by the advocates of hand labor, when, in reality, these mines would have returned a profit on the investment had the methods used during the reign of Montezuma been employed.

The results of such mining operations seem to have inspired many of the later date would-be-mine-managers with desires similar to those of the young man, who, when asked why, in building his new house he had followed so closely the design used by his grandfather, replied, "Grandfather was a successful

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man, he raised three sets of twins in that house. It was good enough for the old man, and is good enough for me." Had the young aspirant for parental distinction built his house on other and more modern lines than those adopted by his successful ancestor, there is no evidence to show that even greater possibilities were not open to this advocate of colonial architecture.

We, as a mining community, have been prone to follow largely in the footsteps of those who in the past have been successful, without first ascertaining accurately what were the exact conditions under which these men labored, and what proportion of such success was due to their personal engineering ability, and what portion of the success was due to natural conditions.

We, as a mining community, have been rather slow in adopting and applying modern methods and appliances in the development of our metalliferous mines. While speaking in general there are a few exceptions which in themselves offer the strongest proof that we have been somewhat backward. These exceptions have been equipped with modern appliances and managed with a large amount of intelligence and business tact, and are to-day producing ore at a profit from mines which, if worked under the old system, would not pay the cost of development. By the introduction of modern hoisting and pumping plants and the installation of compressed air and power drills they have not only reduced the cost of development, but have largely reduced the time usually occupied in placing a mine in a condition to produce ore, which is of the most vital importance when shareholders are anxiously looking for results.

It is only by comparing the cost and the time occupied that we are able to see the advantage possessed by the one system over the other.

The belts which accompany nearly all of the gold-bearing lodes of this Province, and the small quantities of water encountered, together with many other advantages, all offer special advantages for hand labor, and yet, under the most favorable condition, the average cost of sinking a 4 x 12 x 200 foot shaft is found to be not less than \$20.00 per foot, while the speed at

which such work could be accomplished would not exceed 40 feet per month with a double shift, and it may be said this would be almost the limit, while the cost of cross-cuts and levels would correspond favorably with the shaft work. Should it be found necessary to sink the shaft to the 400 foot level \$10 per foot should be added for the additional 200 feet, making a total cost of sinking a 400 foot shaft \$10,000, or \$25 per foot for the entire distance, a sum in many instances far in excess of the amount usually at the disposal of our smaller companies, while the time required to complete such an operation would not be less than thirteen months under the most favorable conditions.

If we accept these figures as fairly representing the cost of hand labor and time required to perform such operations, let us use as a comparison similar work performed with power drills in the sinking of the Golden Lode shaft, a distance of 403 feet, during the spring of 1895; also let us note some comparatively rapid sinking in the Golden Group mine during the month of August, 1897. While this work contrasts favorably with previous records of shaft-sinking throughout the Province, it does not by any means argue that the limit has been reached. On the contrary it has developed ideas which are convincing to the writer that even greater speed can be obtained without very materially increasing the cost per foot of the shaft sunk.

On the property owned by the Golden Lode Mining Company it was pretty well determined there existed a rich gold strike, but that such strike would be deep and consequently expensive to reach. After a careful survey it was found that if this strike was to be developed it would be necessary to sink a shaft 403 feet through hard country rock composed of quartzite, and as this lode was not accompanied by a belt, as is usually the case in mines of this Province, the shaft would have to be blasted out of the solid rock. When the depth to be sunk and the nature of the rock, together with many other disadvantages that were found to exist, were fully considered, the outlook seemed discouraging. It was a new departure, to sink a shaft 403 feet through hard, barren rock to determine the continuity of a gold strike,

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and was something a little removed from the hitherto gold mining practice in this Province.

The graduates of pre-historic practice were in full force and form, and ever ready to volunteer words of caution to any intending investor, and as the estimated cost per foot for timbering and sinking the shaft had been placed at \$15, this was their general point of attack. One would-be mining light, whose years of practice should have placed him beyond the limits of the initiatory department, very profoundly and confidentially confided to an intending investor that the cost would probably exceed \$40 per foot. Truly, the man who has knowledge for others and profiteth not by his own wisdom is indeed to be pitied.

During the month of January, the necessary buildings were erected in which were located the machinery necessary to perform the required work: in the engine house was located a small 35 horse power locomotive boiler, also a small high speed winding engine. Over the shaft, a distance of 125 feet from the engine house, was erected a hoisting tower in which was constructed a ventilating tower 50 feet in height, which in reality was an extension of the eastern compartment of the shaft up through the hoisting tower and 30 feet above it. As steam was employed as a motive force used in operating two Rand No. 2 rock drills, this ventilator was an absolute necessity, as it supplied cool and fresh air to the shaft and carried away the exhaust steam from the drills.

The shaft was divided into two compartments, each being 4 x 4 inside, requiring rock dimensions of  $5\frac{1}{2} \times 12$  feet.

Before beginning operations a model of the shaft was made, and into this model was inserted pegs which represented the position of each and every hole that was to be drilled and their direction. The drill men were fully instructed as to the duty each hole was expected to perform, and were also instructed to put down the holes each day, as shown on the model, irrespective of the seams or slips that might occur in the shafts.

The underground work was divided into three shifts of eight hours each. The first and drilling shift began at 7 a.m. and

consisted of a foreman, two drill men and two helpers. The men in this shift were expected to drill all necessary holes, and to have the work completed before three o'clock, which time they rarely exceeded, as most of the drilling operations were completed before one o'clock: the drills, tools and piping were then hoisted to the surface, leaving the shaft ready for blasting. The second shift, which began at three o'clock, consisted of two muckers and a firing boss, whose duty was to measure the depth of each and every hole, keep a record of the same, also keep a record of the amount of explosive used in each and every hole. This firing boss remained on sixteen hours, and had charge of both the second and third shifts. The records kept by him of the work performed in each shift were recorded in the office at the end of each shift in a book kept for that purpose. This shift was expected to fire the four sump holes and to clean up the same during their eight hours.

The third and last shift, which consisted of but two muckers, were expected to fire all the remaining holes, clean up the rock, quarry any loose rock in the bottom of the shaft, put in new slides and do any necessary timbering, and leave the shaft ready for the drilling shift, which came on again at seven.

On the surface the shifts were divided into two of 12 hours each. The first shift consisted of engineer, deck man, blacksmith and carpenter. The second shift comprised but two men, the engineer and deck man. The deck man in each shift was required to tally the amount of water and rock hoisted in his shift: the engineer also recorded the amount of fuel used each day, which with the other records were recorded in the office at the end of each shift, so that from a perusal of the records it was possible without going into the mine to approximately tell how fast the shaft was being sunk, and at what cost per foot.

When the shaft reached a depth of fifty feet, sinking was suspended and timbering begun. The shifts were then divided into two of 12 hours each.

The first shift cut three hitches in the rock, put in three timbers 12 x 12, and bolted down the heads. Upon these hitch timbers was constructed eight feet of crib work, the

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timber having previously been prepared by the carpenter. The timber used in this crib work was hewn from green logs, they being found the most suitable to withstand the heavy blasting. From the top of this crib to the timber above, stulls were placed in the shaft, and on these was spiked 2 inch plank, which formed the dividing.

The duty of the second timbering shift was to bring down new and permanent slides, new ladders, bring down the main steam pipe and to place a heavy platform over one half of this crib which was used as a station. This work was expected to be completed in 24 hours from the time of beginning. The shaft was then ready for sinking again. The hitches referred to were always cut 12 feet from the bottom. As three feet was found to be about the average sinking done per day, the steam pipe used below this station was cut into sections of three feet each, one piece being added each day. By this means the steam hose was always suspended in the shaft and not under foot.

The drill men each day after coming out of the shaft, took their machines apart, cleaned them thoroughly inside and out, added new parts when required, put in new packing, and kept them up to a standard, so that no delays were occasioned by drills being out of order.

During the month of April the work was performed with but one machine only, which sunk 55 feet 6 inches.

During the entire operation the total number of days occupied in drilling was 124, timbering 16, making in all 140 days required to sink and timber the shaft 403 feet. The average sinking was found to be 3.02 per shift, although five feet was in several instances recorded.

The following is a record of the work performed each month:—

MONTH.	Drilling.	Timbering.	Number of Holes.	Feet.	Explosive.	Buckets of Rock.	Feet Sunk.
April.....	20	4	134	482	201	861	55.6
May.....	24	2	241	941	365	1,249	75.2
June.....	19	4	182	714	316	1,077	73.8
July.....	23	2	231	981	324	1,323	69.6
August.....	23	3	240	953	450	1,393	85.0
September.....	15	3	147	657	236	949	44.2
	124	16	1,175	4,728	1,892	6,852	403.0

The average sinking, as will be seen, was 3.02 per day of 24 hours, while the amount of explosive used per foot is found to be 4.06 pounds per foot of shaft sinking, or \$1.22 per foot, which includes detonators, connecting wire and so forth. The average monthly sinking was 71 feet 6 inches. During the month of August 85 feet was sunk, being the best work performed during the operation.

The total cost of the shaft, which includes management, office expenses, labor, fuel, timber, repairs of tools and all expenses chargeable to the shaft was \$4,647, or \$11.53 per foot, completed and timbered ready for permanent occupancy.

During the summer of 1897 the shaft of the Golden Group Mine was sunk 100 feet below the 240 foot level. The time required to sink this shaft was 30 shifts, and had it not been found necessary to save the small rich lode on the foot wall, this 100 feet would have been accomplished in 25 days.

I am not at present in a position to give the exact cost of this work; it was, however, somewhat in excess of the cost of sinking the shaft of the Golden Lode Mine. The same methods

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	Buckets of Rock.	Feet Sunk.
1	861	55.6
5	1,249	75.2
6	1,077	73.8
4	1,323	69.6
0	1,393	85.0
6	949	44.2
2	6,852	403.0

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were, however, employed, and the same division of labor, showing that what could be done in one place can be done again under the same conditions and management.

When it is considered that the record of 80 feet per month, held by the Tamarack people, is the fastest sinking done in any metalliferous mine on this continent, the sinking of the Golden Lode and the Golden Group shafts in Nova Scotia, with a record of 72 feet per month, makes a fairly good second, and fully illustrates the point that we, as a mining community, are not obtaining the best possible results with the finances and mechanical appliances at our disposal, when we sink shafts 40 feet per month and perform other mining operations on similar lines.

#### DISCUSSION.

MR. LIBBEY—Mr. Hayward might have mentioned, when he stated it was under the same management, that it was the same character of rock.

MR. HAYWARD—The Golden Lode is one of the hardest in the Province. In most of the gold mines the lode is accompanied by a belt. In this we had to make a foot wall out of the solid rock.

MR. LIBBEY—It would be different sinking in slate formation.

MR. HAYWARD—In that case you would use a low grade powder.

MR. STUART—I would like to ask two questions. First, as to the quantity of water you had to contend with; and, second, would you advocate determining the position of the holes previous to examination of the shaft in all characters of rock?

MR. HAYWARD—The holes were put down as nearly as possible at the same depth, so as to leave the bottom of the shaft as nearly level as possible after each shift.

MR. PARTINGTON—Did it require fast timbering?

MR. HAYWARD—We timbered every fifty feet. We could cut fifty feet without timbering.

MR. POOLE—Did you fire shots singly?

MR. HAYWARD—Four sump holes were fired together. That broke five feet between holes.

MR. PARTINGTON—It would be interesting if you would submit a drawing, showing the position of each hole.

MR. HAYWARD—During the first 154 feet we had practically no water. From that down we had from ten to fifteen barrels each hour.

MR. STUART—Could you have obtained the same results if you had enough water to pump?

MR. HAYWARD—We would have the same results by using a tank with a vacuum pump. We did not take advantage of slips, because if we did that we might have to use only one drill at a time. The holes ranged from nine to eleven; two extra holes when there was a corner. An extra hole might be put in when there was a lump. The vein was slightly on the incline. I am quite satisfied that by sinking a shaft eighteen feet in length there is not the slightest difficulty (where you do not attempt to save quartz) in sinking one hundred feet per month. The difficulty in a short shaft is that you can only put in two men. The extra cost on the eighteen feet would be very little.

MR. POOLE presented a paper—

#### A COUPLE OF NOTES ON PUMPING.

In our *Transactions* for 1896 are some papers which refer to pumping with compressed air, and at the time doubt was expressed whether the ordinary direct-acting steam pump was an economical engine to apply compressed air for the purpose in question. Reasons were advanced why such a doubt might be held in the face of very general recommendation of the ordinary steam driven direct-acting pump.

An opportunity recently presented itself for testing the efficiency of such a pump with one of equal size controlled by fly-wheels, and the test was as follows:—Both pumps had plungers of the same size (4 in.) and of the same length of

stroke (12 in.) either could be the same head to be in good v the attendants

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stroke (12 in.) They were placed side by side so that at will either could be made to deliver into the same sized main against the same head of some 650 feet. Both pumps were considered to be in good working order, and any prejudice on the part of the attendants was in favor of the direct-acting pump.

The fly-wheel pump had little clearance in the cylinder and necessarily had to make the stroke of the full length of 12 in.; it cut off the air supply at  $\frac{5}{8}$  ins. and utilized the momentum stored in the fly-wheels for finishing the stroke. On the other hand the direct-acting pump had  $\frac{3}{4}$  in. clearance, and in spite of attention tripped often short of the 12 inches. In fact when ice began to clog the ports and any variation occurred in the air pressure the stroke would drop at times even to eight inches; and this pump necessarily took the full pressure of the air for the full length of the cylinder stroke and clearance.

The rotary pump did not suffer in the same way from ice, although it also makes ice if continuously run for several hours, no known device being able to prevent it under the existing circumstances. It may here be remarked that great relief was got by impinging a fine jet of water on the ports, but as the water available was somewhat destructive to the valve face the use of water was abandoned.

During these tests the conditions of each pump were identical: a uniform pressure of air was maintained; uniform speed of plunger, and the runs were for equal lengths of time, and the delivered water was measured in barrels.

The results in brief were as follows:—

The fly-wheel pump delivered 19 per cent. more water than the direct-acting pump with an equal number of strokes, so that on assumption that the valves in both were equally efficient the stroke of the latter pump could only have averaged 10 inches to the 12 inches of the other. In the compressor room, on the surface, the difference in the call for air was immediately noted, and a saving of 21 per cent. was recorded in favor of the fly-wheel pump; so it appeared that taking these results together, the fly-wheel pump did as much work as the direct-acting pump with only 60 per cent. of the air that the latter required.

The other note on pumping that I would mention relates to the cost of packing plungers of pit pumps that have to deal with dirty water. When a duplex compound steam pump was put in the Acadia pit some 14 years ago, the water it had to throw to the surface against a head of 977 feet was comparatively clean. But in the course of time a change was produced by the decomposition going on in the waste, and now a flocculent reddish deposit accompanies the water, and in the course of time this deposit causes the pump plungers of cast iron to cut in the packing. A year ago it became desirable to replace the set of four plungers, but instead of putting in all four of the same material two were put in of cast iron, and the other two of bronze. In the course of eight months the packing in the plunger glands was replaced four times about those of cast iron, while the original packing around the bronze plungers remained undisturbed. With such an experience it seems reasonable to suppose that the more costly bronze plungers will prove in the long run to be cheaper than those of cast iron under the circumstances mentioned.

#### DISCUSSION.

MR. HAYWARD—How far is the surface receiver from the compressor?

MR. POOLE—Ten feet.

MR. HAYWARD—We had in Montague a similar experience. The receiver was located in the engine room, about thirty feet from the compressor. The pipe would freeze up, and we placed our receiver one hundred feet away and overcame the difficulty. If the first receiver is placed at a longer distance from the compressor you will get better results.

MR. HAMPSON—The latest practice is not to abstract the water, but to dry the air. They have an air cooler. If you dry the air before you pass it to the receiver, you have done your first duty. It is friction that causes moisture.

MR. HAYWARD—A long pipe will do that.

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MR. HAMPSON—Whereas drills would work at some distance and show no ice, a pump worked between the drills and the compressor will freeze. In Mr. Hayward's case there were only drills. Mr. Libbey's drills never showed ice, yet in the case of a pump nearer the compressor we had great trouble with ice. The trouble is that the air at the pumps is at a much less temperature than the air in the mine.

MR. HAIGHT—The quantity of moisture that a given volume of air can hold depends on the temperature only. If a cubic foot of free air, saturated with moisture, is compressed to six atmospheres, it will deposit five-sixths of its moisture when it has returned to its original temperature. The average moisture in air is only about seventy per cent., so that not so much as five-sixths will be deposited. The temperature in the air cylinder of a compressor is much too high for any moisture to be deposited there, so it is necessary to give the air a chance to cool and then to deposit its moisture. Water in the form of a fog may be carried along in a rapid current of air, in the same manner as it is carried in a current of steam giving wet steam, but that water will be separated when the air passes slowly through a receiver. It is merely a question of cooling the compressed air, and then letting it pass slowly through a receiver and deposit its moisture.

MR. HAMPSON—The trouble is that in this country too small a pipe is used. In one mine I found that they had a three inch pipe from the compressor to the receiver, and from the receiver two two-inch pipes. You cannot take enough air through a two-inch pipe to work three drills.

MR. BROWN—The air which goes through water is the driest when it gets into the pit.

MR. HAMPSON—The principal trouble I find is in the exhaust passages. If the exhaust is direct there will be very little trouble.

## MINING AND MILLING COSTS IN QUEENS COUNTY.

MR. LIBBEY presented a paper—

## NOTES ON MINING AND MILLING GOLD ORE IN QUEENS COUNTY, N. S.

Believing that accurate figures giving the actual cost of mining ore from one of Nova Scotia's narrow veins would be of interest to this Society, and to intending investors in this Province, the following results of work both with hand drills and air drills are given. In making comparisons with the cost of landing ore at the rock-breaker on other mines, it must be remembered that the fissure vein at Brookfield averages to be not over 14 inches in width of crushing material. The extreme depth perpendicularly of the workings of the mine is 450 feet.

The figures given include the cost of sinking and drifting, and also, in the first table is covered the cost of excavating a large chamber to hold a double plunger Northey pump and a cistern capable of holding mine water for 12 hours.

During six months from May 1st to November 1st, 1897, 5,606 tons of ore were sent to the mill at an average cost of \$2.54 per ton, as follows for ore landed at the rock-breaker:—

Labor which includes blacksmiths and deck men..	\$11,173 99
Timber and poles.....	392 40
Shovels.....	35 20
Picks .....	20 60
Blacksmiths' coal, 6 tons, at \$10.66 .....	63 96
Charcoal, 300 bushels, at 15c.....	45 00
Axes .....	5 00
Hoisting ropes (estimated).....	50 00
Candles .....	364 29
Loss of steel .....	71 82
Fuel (pumping station and mill) .....	1,046 00
Explosives .....	654 75
Iron (including rails for tracks).....	126 70
Miscellaneous expenses.....	125 00
Lumber .....	45 00
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Some of my coal mining brethren will think coal is dear, but I am obliged to pay freight and teaming. Following are the figures for three months of work with the Ingersoll-Sergeant air plant, and it should be borne in mind, that not only have green men been broken in, but the method of stoping is being gradually changed from breast stoping to back stoping. The results are especially gratifying to the Brookfield Mining Company, as many old timers have flatly stated that a small lead could not be worked as cheaply by an air plant as by hand labor, and in one instance recently, an air plant has been discontinued and a return made to hand drilling.

The months taken are January, February and March, 1898, during which time 2,840 tons were sent to the mill at an average cost of \$2.44 per ton; as follows, for ore landed at the rock-breaker:—

Labor (which includes Blacksmiths and deck men) ..	\$5,078 95
Timber and poles .....	198 80
Shovels .....	10 00
Picks .....	2 00
Blacksmiths' coal, 4½ tons, at \$10.66 .....	47 97
Charcoal, 150 bushels, at 15c .....	22 50
Hoisting ropes .....	25 00
Candles .....	171 00
Loss of steel .....	11 25
Fuel at pumping station and mill .....	717 00
Explosives .....	512 50
Iron (including rails for tracks) .....	43 45
Miscellaneous expenses .....	75 00
Lumber .....	25 00
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	\$6,940 42

The result thus far is apparently to place our ore at the deck head ten cents per ton cheaper with an air plant than by hand work.

We are, however, doing more than twenty-five per cent. more of sinking and drifting with the air plant. In fact, it

would be impossible to place men enough in the mine to equal by hand the work now done by power.

Following is a table showing the expenses of running the 20-stamp mill for six months, commencing September 1st, 1897, and ending February 28th, 1898.

During this time 5,910 tons of ore were milled and concentrated at an average cost of 63 cents:—

Fuel .....	\$876 00
Labor 2 firemen.....	360 00
" 3 amalgamators .....	900 00
" 2 concentrators .....	420 00
" 1 carpenter .....	242 65
" 1 engineer .....	300 00
Miscel. expenses, including lubricants ..	75 00
Cost total for shoes and dies.....	397 53
Mercury lost, 79½ lbs. at 60c.....	47 55
Screen wire, 192 feet, at 50c.....	96 00
Total.....	\$3,714 73

#### DISCUSSION.

MR. HAYWARD—Last year we broke the rock, hoisted it to the surface, pumped the mine, carted the ore to the mill, and paid official expenses in Halifax, at 43 cents per foot. You can bore better in whin than in slate under certain conditions.

On motion of Mr. Bell, Messrs. Brown, Fergie, Poole, Hayward and Wylde were appointed a committee to revise and edit papers and reports of discussions.

The meeting then adjourned.

#### ANNUAL DINNER.

The Annual Dinner of the members took place at eight o'clock, in the Halifax Hotel. Among the other guests present were Mr. Longley, Attorney-General for the Province, Mr. Foster, United States Consul, and Major Ferguson, an English gentleman visiting the country in the interests of a British

syndicate. After menu, the Chairman Queen," which was by that of "The P was also received Consul having s Poole proposed

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quite sure that no that Mr. Murray, w ernment on all occas am very sure that s him from attending at these social gath ever since its forma my lot seems to be vicissitudes. I do of this government some political oppon get out half as bad remain a member of duty to advance the can. (Applause.) you have referred do less than say tha pies a unique positio been mining associa Canada, but among t any degree of healt

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syndicate. After ample justice had been done to an excellent menu, the Chairman gave the time-honored toast of "The Queen," which was received with characteristic loyalty, followed by that of "The President of the United States," a toast which was also received with great heartiness. The United States Consul having suitably acknowledged the compliment, Mr. Poole proposed

### THE LOCAL GOVERNMENT.

HON. MR. LONGLEY—Mr. President and gentlemen, I am quite sure that none of you regret more sincerely than I do, that Mr. Murray, who properly represents the Provincial Government on all occasions, should not be present here to-night. I am very sure that some matter of public moment has prevented him from attending. I have had the pleasure of being present at these social gatherings of the Mining Society of Nova Scotia ever since its formation. Some people come and some go, but my lot seems to be doomed to stay in this body through all its vicissitudes. I do not suppose there is any political opponent of this government (and by some strange infatuation there are some political opponents of this government) that wants me to get out half as badly as I want to get out, although while I remain a member of the government it shall be my pleasure and duty to advance the interests of the people of Nova Scotia all I can. (Applause.) I thank you for the kind manner in which you have referred to the Local Government, and I cannot do less than say that this Mining Society of Nova Scotia occupies a unique position in the Dominion of Canada. There have been mining associations formed here, there and elsewhere in Canada, but among them all this is the only one that exists with any degree of health and prosperity.

The object of this dinner of the Mining Society is rather for fun than to discuss questions which relate to mining, yet you will pardon me if I venture to say a word or two more in line with the purposes and objects of this Society. The first observation is that whereas the mining interests of Nova Scotia are

to-day in the front rank of the industrial interests of this Province, and while the mining interests of Nova Scotia, I have no hesitation in saying, are the greatest mining interests to be found anywhere in the Dominion of Canada, the fact remains that fortuitous circumstances have brought about that in the great money markets of the world other Provinces of Canada receive greater booms than Nova Scotia. But water finds its level, and as a matter of fact in the long run that country will take the most important place in relation to mining interests that has the greatest mining resources, and if it be a fact, taking all our minerals into consideration, that Nova Scotia has the greatest resources of any portion of the Dominion, the time will come when this will be recognized, and when this will be the favorite field for the investment of the capital of the world. (Loud applause.)

Coal occupies a position which must be satisfactory to those interested in mining matters. A few years ago the government granted a special lease and charter to the Dominion Coal Company. Two or three things were predicted with respect to that, not altogether consistent with one another; but in making predictions consistency is no factor. The first prediction was that these coal mines falling into the hands of foreigners would be closed in a short time, to the detriment of the people of Cape Breton and the utter ruin and downfall of the British Empire. That prophecy has not been fulfilled. The Dominion Coal Company have exercised a most low-lived tendency toward getting out coal. They have reached that stage that they would sell that coal to Englishmen, Spaniards or Ethiopians; in fact to any person who would buy coal. (Hear, hear.) There was a prediction that these people would be able, by means of the special boon given them by the government, to drive all other coal out of the Province, and that every other company would have to pack up and get out. This was not fulfilled. The Intercolonial Company never had a more prosperous year than 1897, and I trust it may have many more prosperous years. The General Mining Association had a prosperous year also. (Applause.)

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We have another extremely important mining industry, namely, gold mining. It is one in which I have the most abounding faith. (Applause.) Not because I talk after dinner, but from a sincere conviction. The returns to date have been very satisfactory, considering the circumstances surrounding the development of gold mining since the discovery of gold. In the first place we have not received very large accessions of foreign capital in respect to the development of gold mines. So far as the investment of British capital in the gold mines of our Province is concerned, in the main (I am making no general statement), most of it has been invested under the most unfavorable auspices, under the management of incompetent English people (hear, hear), and in the main, not in every case, under the influence of English mining engineers who knew nothing about the conditions of gold mining in Nova Scotia, and whose methods were inconsistent with the remotest possibility of success. (Hear, hear.) That does not alter the fact that the gold mines of Nova Scotia to my mind now present more than ever prospects of splendid results to the investor of capital. (Applause.) Hitherto holes have been dug in the ground and some quartz taken out, and if it realized from one to five ounces to the ton, it was ground up and the gold taken out. But any systematic method of opening lodes and taking out the ore has hardly yet come into existence as a regular feature of the mining industry in Nova Scotia. Some years ago application was made to the Government of Nova Scotia by people interested in mining, pointing out that it was desirable that the government should give a special grant for the purpose of opening up leads and carrying on a system of underground mining on a large scale. The government did not accede to the desire that provincial money should be put into any such enterprise, and although there may be a difference of opinion at this table, and differences of opinion are always to be respected, I am bound to say I think that the majority of fair minded men here will agree that if the Government of Nova Scotia had done that they would have taken a course contrary to sound business prin-

ciples. (Applause.) Enterprises walking upon props are of no value, and will never get on a good footing if tampered by government aid. There will come a time, and it is rapidly approaching, when capitalists will become convinced that by sinking hundreds of feet below the surface the most profitable results possible will be attained, and when it is introduced as a legitimate business enterprise it will be on a permanent basis. I have one other observation to make with which I am sure you will all agree, and that is that we want to bring to our aid men having the fullest scientific knowledge of whatever pertains to this industry. It is, after all, a question of knowledge. Knowledge is power in Nova Scotia as elsewhere, and we need never expect to accomplish any miracles or to get permanent results by resorting to misrepresentations of any character. (Hear, hear.) We want to know dead cold facts in regard to our mineral resources, and when we have them we have a basis upon which we may expect to make money, or abandon the prospect of making money in the gold mining industry of Nova Scotia. I may state, Mr. Chairman, that I have been making myself the greatest possible efforts to get one or two wealthy men in the city of London to invest in Nova Scotia in one or two of the most promising gold mining centres, for the purpose of testing the sinking of a deep shaft and mining on a large scale. If they would do this under the direction of Canadian managers who had actual working experience here in Nova Scotia, I believe the result would be satisfactory.

There is another important mining industry to which I should refer, namely, iron mining. When we consider that we have unlimited resources with respect to coal in Nova Scotia, and according to Dr. Gilpin's report, which I do not think any person would care to call in question, that there is more iron than there is coal to smelt, and when coke can be obtained at a reasonable rate in Nova Scotia, it is unfortunate that hitherto the smelting of iron has not been attended with the best possible results. I hope to see Nova Scotia a great centre of smelting works. I still hope with the enterprise of our people, aided by

oreign capital, the Nova Scotia will take pig iron as well as

We also have a worthy of the interest far as the Government always manifested within its scope all industry. (Hear, hear.) pockets for favoring next day we get about the expectations at the expense. If the Government I would think we have am satisfied we have are engaged in the matter of Mr. Bell, and his a great organ of publicity in Nova Scotia. Nova Scotia are the best. It is one of the British subjects that the Government and all its laws of Nova Scotia, yet the mining laws as they have (Hear, hear.)

A commission is anything that can be a factory, that commission (Hear, hear.)

I feel that I have I have spoken of the possible interest to me. I am sure that I wish and prosperity. I thought received this toast, a



oreign capital, that we will have profitable results, and that Nova Scotia will take its place as one of the great producers of pig iron as well as steel.

We also have a fine copper deposit in Nova Scotia which is worthy of the interest of this Society and of the Government. So far as the Government is concerned, I think I may say it has always manifested an interest in mining matters, and tried to do within its scope all it could to assist in developing the mining industry. (Hear, hear.) One day we are abused like pick-pockets for favoring capitalists and owners of mines, and the next day we get abused for lending ourselves to demagogue associations at the expense of those putting capital into enterprises. If the Government were praised by one and abused by the other, I would think we had done wrong, but when abused by both, I am satisfied we have done pretty nearly right. (Laughter.) We are engaged in the revision of the Statutes. I have the opinion of Mr. Bell, and his authority for stating, representing as he does a great organ of public opinion with reference to mining matters in Nova Scotia and in Canada, that the mining laws of Nova Scotia are the best yet of any of the Provinces of the Dominion. It is one of the inestimable boons of all free born British subjects that they have the liberty to abuse the Government and all its laws, and they will even abuse the mining laws of Nova Scotia, yet in the main I think we have as good mining laws as they have in any part of this continent of America. (Hear, hear.)

A commission is now engaged in revising the Statutes, and anything that can be done to make the mining laws more satisfactory, that commission will have pleasure, I am sure, in doing. (Hear, hear.)

I feel that I have occupied too much of your attention, but I have spoken of these matters because they are of the greatest possible interest to me and to the Government of this country. I am sure that I wish this Mining Society the utmost success and prosperity. I thank you for the manner in which you have received this toast, and as I have so long in the past had the

privilege of attending these meetings, I trust an accident of fate will not deprive me of a position, one of the perquisites of which is to enable me to enjoy the delights of your most charming hospitality. (Loud applause.)

### THE MINING INDUSTRY OF NOVA SCOTIA.

MR. B. T. A. BELL—Gentlemen, I have great pleasure in proposing this toast, not only as one of the oldest members of this Society, but also as one who has an extensive acquaintance with the mineral resources of the other sections of the Dominion. I can heartily endorse the highly eulogistic sentiments expressed by our friend, the Hon. Attorney General, with respect to the great future in store for the mineral resources of Nova Scotia. I can assure you from my peregrinations throughout this country, and from my knowledge of other mining districts in the Dominion, I am more than ever confident that Nova Scotia will in the future occupy a very prominent position as a mineral producer, both of coal and gold, as well as other minerals. I have great pleasure in asking you to drink continued success to the mineral industries of Nova Scotia. (Applause.)

MR. LIBBEY—I hardly anticipated the pleasure of making a speech, and I must confess there is one of the alloys of metal that I lack, and that is brass. The Hon. Attorney-General has very ably set forth the prospects of the Province, and I cordially agree with him in saying that the mining industry does not need pap. (Hear, hear.) Although I represent a mining industry as severely taxed as any other, I may say that the gold miners do not need any help. We will not even ask to have the two per cent. taken off. (Laughter.) One matter I would like to mention particularly, is the Mining Report. We should either have a comprehensive report setting forth what has been done, or none at all. (Hear, hear.) Most of you are familiar with what we are doing at Brookfield, and I believe there are many other places in the Province capable of making returns that would put us in the shade, and I have no doubt that in the near

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The last toast  
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future they will do so. I can only add my best wishes for the future success of the mining industry. (Applause.)

Mr. C. A. MEISSNER also replied to the toast, referring more particularly to the importance of the iron and steel industries of Nova Scotia.

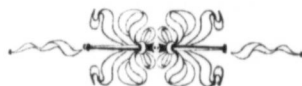
### THE GUESTS.

The last toast was that of the Guests, proposed by the Chair.

MAJOR FERGUSON—I am very much indebted to my friend, Mr. Oland, for the pleasure of meeting you here. I feel that I am rather a fraud, because I only left the service five months ago, and can scarcely be looked upon as an authority on mining matters. I represent capitalists who have sent me out here to examine and report upon the gold mines of British America and the Yukon. We have delayed our departure from Nova Scotia very much beyond the time originally intended for it, because we have found so much interesting matter here that we felt we could not leave this place without further investigations. The mining engineers associated with me tell me from their experience, that they have never seen or dreamed of the possibility of such a field of venture as that of Nova Scotia. Some of the properties, however, are worthless, simply because they have not been worked in a systematic manner. The first idea is the one expressed by Hon. Mr. Longley, that you must go down and get into the old country. You have a new country on the surface which is misleading. You must find capital to go down. So confident are we in what we have seen and heard that we are endeavoring to acquire some property here, and I hope in the course of a few days we will have acquired it. I feel assured that there will be no necessity for us to go further afield with the object of making money. I can only say that I am deeply indebted to you for having given me this opportunity of meeting you, and I wish you every success; and I hope if we do locate here, we shall be good friends and

pull together, and help each other to the best of our ability.  
(Applause.)

The remainder of the evening until long past midnight was spent in the enjoyment of a first-class musical programme. The entertainment being materially enhanced by the splendid vocal contributions of a theatrical company then playing in Halifax. Mr. Johnston's clever recitations were also the source of much amusement and were deservedly encored.



## July Meeting

The July meeting was held at Westville, on

The members of the Society arrived at Westville on July 1st, arriving at 7 o'clock.

On Wednesday morning the members proceeded to the works of the Mr. Graham Fraser, where they saw an interesting view of the Steel Works. From the Steel Works they proceeded to Fraser's Mountain, where they saw the surrounding country.

In the afternoon the members visited the old Ford Pit, where they saw the workings of the Acadia Coal Co., and also the various points of interest there to Mr. Poole's collection. The day was terminated by Mrs. Poole's dinner.

In the evening the members met at 7 o'clock. There were present the Vice-Presidents, Lieutenants H. S. Poole and E. M. MacDonald, Mr. Clendenin, Hugh Fraser, G. Rutherford, and others.

The Minutes of the previous meeting were read.

On motion of Mr. G. S. Troop was

**THE SECRET**

man of the Committee presented evidence from mine, and stated that circular



## July Meeting, held in Pictou County.

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The July meeting of the Society was held at New Glasgow and Westville, on the 27th and 28th July.

The members left Halifax on the afternoon of Tuesday, 26th July, arriving at New Glasgow at 10 o'clock.

On Wednesday, in the forenoon, the party were driven out to the works of the N. S. Steel Co., and under the guidance of Mr. Graham Fraser, Mr. Harvey Graham and Mr. Thos. Cantley, an interesting two hours was spent inspecting their plant. From the Steel works the party were driven to the summit of Fraser's Mountain, and enjoyed the beautiful view of the surrounding country which is to be seen from that spot.

In the afternoon, a visit was paid to the surface works of the old Ford Pit, where Mr. Poole and Mr. Rutherford, of the Acadia Coal Co., met the party and conducted them over the various points of interest in that locality. Proceeding from there to Mr. Poole's residence, the party were hospitably entertained by Mrs. Poole, returning to New Glasgow at 6 o'clock.

In the evening, a meeting was held at Hotel Vendome, at 8 o'clock. There were present: Mr. Charles Fergie, President; Vice-Presidents Libbey, Meissner and Hayward; Past Presidents H. S. Poole and R. H. Brown, Messrs. Robb, Graham Fraser, E. M. MacDonald, Crockett, M. R. Morrow, F. H. Mason, J. W. Clendenin, Hugh Fletcher, W. G. Matheson, Harvey Graham, J. G. Rutherford, and H. M. Wylde, Sec.-Treas.

The Minutes of the last meeting were read and confirmed.

On motion of Secretary Wylde, seconded by Mr. Morrow, Mr. G. S. Troop was elected a member.

THE SECRETARY, in the absence of Mr. Wilson, Chairman of the Committee appointed at last meeting to obtain evidence from miners regarding amendments to the Mines Act, stated that circular letters had been issued, but very few replies

had been received, and it was decided that, if possible, printed copies of the Mines Act, as amended by the Commission appointed by Government, be obtained and issued to members.

MR. C. A. MEISSNER read a paper—

#### NOTES ON COAL AND COKE.

At a meeting of the Mining Society in this section (Pictou County) it will probably be interesting to give a few notes on coke and coal, especially with reference to the comparative benefits of washing the latter. My references are in the line of coke and coal for blasting furnace use.

The Nova Scotia coals, as a rule, are very well suited for blast furnace purposes, except that the ash is too high. To overcome this, washing is about the only remedy, and I think this has been pretty well demonstrated by this time, by the Luhrig washing plant at Ferrona, and the Robinson washing plant at Westville. As to comparative efficiency of these two plants I am not prepared to give any figures, though it would be a matter of very great interest to be able to make a comparison as to quantity of output per day and quality of coke, also data as to waste, and cost of washing. The difference in cost of erection of the two plants is very great, and in view of that the above data would be of very great interest.

Structurally, our coke here is probably not quite as good as the cokes in Pennsylvania, particularly the Connelsville and West Virginia; but the later results of washing all indicate that there is no difficulty in getting the ash to range from nine to fourteen per cent.

As to the increase in value brought about by washing, the following data gathered by Mr. Zirkler and myself at the time when our furnace was still running, may be of interest; of course some of the figures have changed since then, prices of coal are different, and the quality of the coke is very much better; ash is now much lower than it was then, as the data refers to the earlier stages of washing at the Drummond Colliery; but they will do as a matter of comparison.

A very interesting article given in an article some years ago, of Iron Ore, Lime the time my data coals, washed and

#### Comparative

WASHED COAL—Cost \$1

12 p.c. ash.  
20.5 vol. mat.  
66.0 fixed ca  
1.5 sulphur.

100.0 p.c.

These figures a coal would of course in price would have to be determined by mutual agreement,

According to al coal would be about ing coke would be p.c. sulphur.

The unwashed coke, and composition 23.5 p.c. ash, 1.5 p

If the price of v ton of coke made p price per ton of co cost of coal.

The price of un of coke, and the ton

As to the real 15.20 p.c. of ash, v ton, to flux this ash 0.076 of carbon to

A very interesting set of data on this subject, however, is given in an article written by Mr. R. E. Chambers, of Ferrona, some years ago, entitled "A method of ascertaining the value of Iron Ore, Limestone and Coke, for Blast Furnace Use." At the time my data were collected, the average analyses of these coals, washed and unwashed, were about as follows:—

*Comparative Cost and Value of Drummond Coal,  
Washed and Unwashed.*

WASHED COAL—Cost \$1.49 per ton.

UNWASHED COAL—Cost \$1.17 per ton.

12 p.c. ash.  
20.5 vol. matter.  
66.0 fixed carbon.  
1.5 sulphur.

19 p.c. ash.  
19.0 vol. matter.  
60.0 fixed carbon.  
2.0 sulphur.

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100.0 p.c.

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100.0 p.c.

These figures are based on dry coal (212° F.); the washed coal would of course carry more moisture, for which allowance in price would have to be made. The amount of moisture would have to be determined by analysis, or a certain figure could, by mutual agreement, be taken as standard.

According to above analysis the theoretical yield of washed coal would be about 79 p.c., and the composition of the resulting coke would be about 83.50 p.c. carbon, 15.20 p.c. ash, 1.30 p.c. sulphur.

The unwashed coal would yield theoretically about 80 p.c. of coke, and composition of this coke would be about 75 p.c. carbon, 23.5 p.c. ash, 1.5 p.c. sulphur.

If the price of washed coal is \$1.49 per ton, the price of 0.79 ton of coke made per ton of coal, would be the same, and the price per ton of coke would be  $\frac{1.49}{0.79} = \$1.886$ , only considering cost of coal.

The price of unwashed coal is \$1.17 per ton, giving 0.80 tons of coke, and the ton of coke therefore at  $\frac{1.17}{0.80} = \$1.462$ .

As to the real value of the coke, the washed coke with 15.20 p.c. of ash, will require about 0.15 ton of limestone per ton, to flux this ash, and the resulting 0.19 ton of slag will take 0.076 of carbon to melt it.

Therefore from every ton of coke used we get :—  
 $0.835c. - 0.076c. = 0.759c.$  T or 75.90 p.c. of available carbon at  
 a price of

\$1.886	(on account of coal)
\$0.150	" " limestone)

---

\$2.036

and the price of one ton available carbon out of washed coke =

\$2.036  
 ——— = \$2.682

\$0.759 p.c. c.

23.50 p.c. ash in unwashed coke will require 0.395 T. of lime-  
 stone per ton of coke to be fluxed, and take 0.158 of carbon to  
 melt the resulting 0.395 T. of slag, leaving an available carbon  
 of  $0.75c. - 0.158c. = 0.592c.$  T. or 59.20 p.c. at a price of

\$1.462	on acct. of coal
0.235	" " limestone

---

\$1.697

and the price per ton of available carbon out of unwashed coke is

\$1.697  
 ——— = \$2.866

\$0.592 p.c.

These figures are only theoretical, and in real practice we  
 could not get such yields as 79 and 80 p.c. in our bee-hive  
 ovens, but both coals would be affected in the same way and the  
 figures of \$2.682 per ton available carbon from washed coal  
 and \$2.866 per ton available carbon from unwashed coal show  
 about the right proportion of prices.

Another interesting little set of data that were made by us  
 at the time the furnace was running, was on the question of raw  
 coal in the furnace, which I give herewith :—

Our Drummond coke then contained on an average about 18  
 p. c. ash, while the Drummond lump coal showed about 19 p.c.  
 ash : sulphur was practically the same in both. Volatile mat-  
 ter and moisture in the coal was 25 p.c., and the proportion of

fixed carbon, neglig-  
 coke : 56 p.c. in D

One hundred  
 stone to flux the  
 about 8.2 tons of  
 available for the f  
 ash and 8.2 carbon  
 in coke.

The cost is 100

15

or per ton availabl

One hundred to  
 carbon ; it takes 15  
 ing slag of 23.3  
 and the carbon re  
 56—9.3 = 46.7 ava

The cost is 100

19

or per ton of avail

Now as we wen  
 tons of coke by 10  
 use 160 tons of c  
 required 160 tons o  
 to 100 tons of coke  
 another way :

74.8 tons available

74.8 tons available c

$74.8 \times 4.88 = \$365.$

$74.8 \times 4.80 = \$359.$

While apparent



fixed carbon, neglecting sulphur, was: 83 p.c. in Drummond coke; 56 p.c. in Drummond coal.

One hundred tons of coke require about 15 tons of limestone to flux the ash; the resulting slag of 20.3 tons requires about 8.2 tons of carbon to melt it: the carbon thus remaining available for the furnace process is: 100 original coke less (17 ash and 8.2 carbon = 25.2) or  $100 - 25.2 = 74.8$  available carbon in coke.

The cost is 100 tons of coke. . . . . \$350.00

15 tons of limestone. . . 15.00

---

\$365.00

or per ton available carbon = 365.00

---

= \$4.88

74.8

One hundred tons of coal contain about 56 tons of available carbon; it takes 19 tons of limestone to flux the ash: the resulting slag of 23.3 tons requires 9.3 tons of carbon to melt and the carbon remaining available for the furnace process =  $56 - 9.3 = 46.7$  available carbon in coal.

The cost is 100 tons of coal = \$205.00

19 tons of limestone = \$19.00—Total \$224.00

or per ton of available carbon 224.00

---

= \$4.80

46.7

Now as we were then using the coal, we were replacing 100 tons of coke by 100 tons of coal, while we could have afforded to use 160 tons of coal without additional expense, because it required 160 tons of coal at 46 p.c. available carbon to be equal to 100 tons of coke at 74 p.c. available carbon, or to put it in another way:

74.8 tons available carbon out of 100 tons of coke are equal to 74.8 tons available carbon out of 160 tons of coal, and the price is

$74.8 \times 4.88 = \$365.00$  for coke carbon, and

$74.8 \times 4.80 = \$359.00$  for coal carbon.

While apparently this would indicate quite an advantage in

the use of raw coal, I think this advantage is entirely dependent on the quality of the coal; with a hard splinty coal such as they use in Scotland, the advantage is very decided; with our soft coal here, however, I do not see that we gain anything particular by the use of them, except that at times when we are short of coke, the use of a proportion of coal tided us over without injury; I do not think it would have been safe to have continued any large quantity very long. In fact, at the time I judged that the only real value lay in the improvement of the gas, and I think that for this purpose it is well to always have coal ready for use in the furnace whenever the gas gets poor, and I have often wondered why it is not used more by furnacemen at times when the shortage of gas makes whatever troubles are occurring, much more serious. I think our soft coals really burn when thus put in the furnace long before they reach the melting zone, so that the greater portion does not do the work that the hard coke is expected to do in the furnace.

MR. POOLE gave a very interesting description of the Picton coal field, illustrating his remarks with maps.

A vote of thanks was tendered to Mr. Meissner and Mr. Poole for their papers, and also to the N. S. Steel Co., and to Mr. Poole, for the kind manner in which they had entertained the members during their visit.

The meeting then adjourned.

On Thursday, 28th July, the party drove to Westville, and proceeded to the Drummond Colliery, where the Vice-President and Manager, Mr. Chas. Fergie, met them. Pit clothes and safety lamps were issued, and boarding the cars a visit was paid to the workings underground. On regaining the surface, Mr. Fergie, after shewing the party over his surface works, escorted them to his residence, where they were cordially welcomed by Mrs. Fergie. A sumptuous luncheon was then served, after which, with three cheers for Mr. and Mrs. Fergie, the party drove to the station to catch the train for Halifax, arriving there at 9 o'clock, having had a very successful meeting.

A meeting of the  
the rooms of the Soc  
Present: Messrs. C  
Charles Archibald,  
Joseph Austen, H.  
Graham Fraser, F.  
Charles Starr, A. E.  
Wylde.

The Secretary  
which were, on mot

Captain Riley,  
and Wylde, was dul

Mr. Alex. McNe

#### SOME NOTES ON THE

There is in this  
many persons, not u  
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them made to turn u  
This false notion is c  
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prohibitory law.

But while this is  
estimate the importa  
the laws and the in  
Nova Scotia we have  
and its critics. In

## December Meeting.

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A meeting of the Mining Society of Nova Scotia was held in the rooms of the Society on December 21st, 1898, at 10.30 o'clock. Present : Messrs. Charles Fergie, President, Alexander McNeil, Charles Archibald, John H. Anderson, C. E. Willis, B. C. Wilson, Joseph Austen, H. V. Haight, H. A. Saunders, J. D. McGregor, Graham Fraser, F. H. Mason, C. F. Andrews, A. A. Hayward, Charles Starr, A. E. Hampson, George E. Francklyn, and H. M. Wylde.

The Secretary read the minutes of the previous meeting, which were, on motion, adopted.

Captain Riley, of Montreal, proposed by Messrs. Andrews and Wylde, was duly elected a member of the Society.

Mr. Alex. McNeil, of Halifax, read a paper, entitled—

### SOME NOTES ON THE PROPOSED REVISION OF THE MINES ACT OF NOVA SCOTIA

There is in this country a strange craze for more law. With many persons, not merely a single industry—such, for instance, as mining—is dependent upon what our Legislature may do, but the general welfare and prosperity of the whole country is by them made to turn upon the action of a handful of law-makers. This false notion is carried to such a degree that there are many earnest and sincere men who believe that more than three-quarters of the evils of this country could be removed by prohibitory law.

But while this is an extreme view, it is difficult to over-estimate the importance of the true relation existing between the laws and the industrial development of the country. In Nova Scotia we have a Mining Law which has both its admirers and its critics. In the letter of "Working Miner," in the

October number of the Canadian Mining Review, and the spirited paper on a "New Gold Mines Act," read at your last meeting, you have an instance of the favorable comments of the one, and the adverse criticism of the other.

The intimate relation existing between the Government and those engaged in the mineral industry in this Province makes it imperative that the laws governing all parties should be stable, equitable and impartial. But it is difficult, it is impossible, to devise a revolutionary change in the law that would not materially affect existing rights. And who is familiar with the legislation and litigation of the past that will seek changes in the law, except when absolutely necessary? Let us look at this matter in relation to the important subject of "Surface Rights." You will find Sections 18 to 43 inclusive, of the proposed Act, deal with this subject. You may urge that this law is cumbersome, that it is too favorable to the owner of the surface, that it does not give the lessee entry or possession, and many other objections. But against these is the complete, sufficient and satisfactory answer—IT IS SETTLED. It has been tried and interpreted by the highest Court of Appeal. We now know what it means. Leave it there. The well-known case of Palgrave vs. McMillan, besides settling the law on surface rights, has a valuable lesson for those who seek changes in the law, for it must be remembered that the Palgrave Mining Company suffered, not on account of the law as it appeared in the Act, but because the Supreme Court of Nova Scotia persisted in reading into it things which were not there. We know now, for the Privy Council has said so, that our Supreme Court was wrong in regarding the Warden in this matter as a Judicial Officer, or his appointment of an arbitrator as a judicial proceeding, or that a notice that was not mentioned in the Act should be given. We know that they were wrong in setting aside the award for uncertainty, because it could not in the nature of things be made certain. Do we want more capitalists disgusted? Do we want another good, substantial mining company to spend years of time and thousands of dollars to find out what the law is? Do

we want another firm idle while the spook investors' hopes? Do we want stubborn surface owners' company. Given this Palgrave vs. McMillan

What miner would have pronounced satisfactory if besought by the constant notes of a professional

There is another class of men who are forever denouncing the law. Hobhouse, who dealt with one party against the award, clearly the framers of the subject they were dealing with

Turn again to the case. A careful reading of the *Attorney-General v. Temple*, may put us to rest as to means; but one thing is certain: to read sense and common sense into the Legislature, in its evil days, had made no sense of protracted and expensive decisions was, we hear little lately

Let us look at the case. It may lose his lease under sections 47, 57, 62, 218. It will be found to—

- (a) File for a year
- (b) Pay stipulation material from a license



we want another fine property such as Hurricane Point, to lie idle while the spooks of litigation enjoy a witches' dance with investors' hopes? If we do, get a new law on surface rights, a stubborn surface owner, a valuable property and a wealthy company. Given this combination, we can expect a repetition of *Palgrave vs. McMillan*.

What miner would exchange a well-tried machinery, pronounced satisfactory by the best experts, for something new, even if besought by the dulcet tones of a rival agent or the discordant notes of a professional grumbler?

There is another lesson in *Palgrave vs. McMillan* for those who are forever denouncing our law as unskillfully drawn. Lord Hobhouse, who delivered the judgment of the Privy Council, dealing with one phase of the objection of uncertainty made against the award, said: "It is only important as showing how clearly the framers of the statute saw the uncertainty of the subject they were dealing with."

Turn again to the much controverted question of forfeiture. A careful reading of the cases *Attorney-General vs. Reynolds*, *Attorney-General vs. Sheraton*, and *Attorney-General vs. Temple*, may put us in a Fundy fog as to what the law really means; but one thing is clear enough—the courts are struggling to read sense and consistency into a rapidly changing law. The Legislature, in its evident desire to rid forfeiture of some of its terrors, had made numerous changes. The result was a period of protracted and expensive litigation. The general result of these decisions was, however, beneficial, and as a consequence, we hear little lately of forfeitures.

Let us look at the proposed law to see by what ways a man may lose his lease by forfeiture. The matter is covered by sections 47, 57, 62, 141 to 143, 174, 177, 202, 203, 206, 216 to 218. It will be found that forfeiture is the penalty for failure to—

(a) File for a year from the time of application.

(b) Pay stipulated royalties on gold and silver bearing material from a licensed mine.

- (c) To comply with stipulations in the lease.
- (d) To pay annual rental thirty days after notice mailed.
- (e) In case of mines other than gold or gold and silver, abandonment for a year.
- (f) Non-working in certain cases.
- (g) Fraud and misrepresentation.

Surely, someone exclaims, here are as many pitfalls as were to be seen on the bridge in the Valley of Bagdad. They should all, with possibly one exception, be included in section (c), namely, the stipulations in the lease.

This leads us to an examination of what is by far the most important matter for our consideration, namely, the lease. If it is not expedient to have a new Gold Mines Act, it is both necessary and expedient to have a new Gold Mines Lease. In this connection, let us consider what a lease of mines of gold and gold and silver now contains, and what, from the lessee's standpoint, it should contain. A glance at the lease in Appendix A, shows that it embodies a series of stipulations on the part of the lessee, but there are no covenants on the part of the lessor. This is not the kind of lease drawn when the lessor and lessee meet and agree upon terms. Look, for example, at the lease between the Government and the Dominion Coal Company, as ratified by Act I. of the Acts of 1893. Here, men prepared to go into the business of coal mining upon such an extensive scale as to yield largely increased royalties to the Government, sought for and obtained important changes and provisions in their lease. The most important of these was that the lease should be construed as declaring the respective rights of the parties thereto. And the next most important provision was that the Government promised, and the Legislature ratified the promise, that this relationship should not be disturbed by subsequent legislation. Then there are the important covenants on the part of the lessor ensuring possession and quiet enjoyment, freedom from additional burdens of taxation, guarantees of ownership of the leases in the coal, and the consequent freedom from city, town

and municipal tax transfers. And in

"The said lessor, the said lessee, its not, during the pe other person, firm or any lease to min hereby demised, ex firm or corporation, hereby conferred, or

More than this, less protection than

Section 7 provide the parties thereto. These are all reason with necessary char dix A. Then there holders might surre

Especially shoul of the lessor that should not be tak instance of this kin of the proposed Act.

In the Attorney ing the judgment of second ground for h in that case, that l different position fro regards forfeiture.

tion, thus taking aw referred to, would Attorney-General v should be provided a

It is, however, printed pamphlet be it is for the most pa

and municipal taxation, that the government will assent to transfers. And in section 6 of the lease is the following :—

“The said lessor further covenants and agrees to and with the said lessee, its successors and assigns, that the lessor will not, during the pendency of this lease, give or grant to any other person, firm or corporation, any license to search or work, or any lease to mine any mineral in, over or under the areas hereby demised, except upon the condition that the said person, firm or corporation, shall not interfere with any of the powers hereby conferred, or the premises hereby demised.”

More than this, the lessee could not reasonably require, and less protection than this, it were a disgrace to the lessor to afford.

Section 7 provides for arbitration in case of dispute between the parties thereto. Sections 8 and 9 deal with forfeiture. These are all reasonable and desirable provisions, and should be, with necessary changes, inserted in the form of lease in Appendix A. Then there should be a provision that existing leaseholders might surrender the old and take out the new lease.

Especially should every lease contain a promise on the part of the lessor that the rights secured to the lessee thereunder should not be taken away by subsequent enactments. An instance of this kind of legislation may be found in section 148 of the proposed Act.

In the *Attorney-General vs. Temple*, Sedgwick, J., delivering the judgment of the Supreme Court of Canada, gives as his second ground for holding the declaration of forfeiture invalid in that case, that lessees, prior to 17th April, 1889, were in a different position from those holding subsequent to that date as regards forfeiture. Section 148 seeks to remove this distinction, thus taking away a right which, according to the judgment referred to, would have been sufficient to save the lease in *Attorney-General vs. Temple*. This is manifestly unfair, and should be provided against.

It is, however, not very profitable to closely criticise the printed pamphlet before us. It is not the present law, although it is for the most part a copy of it. Nor is it a copy of the Bill

that the revisors of the statutes will present to the Legislature. It is only a part of it. And of that part of it the provisions respecting appeal and registration are to be considerably changed. Sub-heads are to be inserted, and such other changes as the revisors may deem desirable. But the pamphlet printed by this Society is merely the preliminary draft of one of the revisors. Doubtless, when the matter is brought before the "Commissioners for Revising the Statutes of Nova Scotia," many verbal changes and corrections will be made, and mis-placed sections put where they belong, and ambiguous portions made clear. This is the duty of the revisors, and they are well qualified to perform that duty.

But if substantial changes are desired by this Society, they should be formulated at this meeting.

Does our Society as a body believe that the dual system of location by metes and bounds or by staking, is unfair and prejudicial to the best interests of mining in this Province? That a larger gold area should be adopted? That the rental and royalty claims are over-burdensome? That the life of the lease should be still further extended? That protection should be afforded the holders of lease and licenses against other or subsequent holders? That better provision should be made for surveys and inspection?

These are some of the practical questions that should be discussed by men in the business. It cannot be expected that the men in the Department of Mines or the Government, much less the Revisors of the Statutes, will undertake to make changes in the law affecting such matters. But if the practical men in this Society see the need for such changes, or have learned by experience that provisions in the present law work hardships to the mining industry, this is an opportune time for them to have such changes made. Let those changes be made now, and then let agitation for amendments cease. The *Canadian Mining Manual*, at page 203, says:—"The Mining Law of Nova Scotia is exceedingly fair and easy to interpret." But still there is a

persistent agitation. Mining Law is what

Therefore, every Province should be and for all. There Law of Mines as to depend the future of mineral industry on development upon once make up their efforts to de Province, and then the assistance of expect Nova Scotia indisputably holds in this great Dominion.

#### THE PRESIDENT

is a very valuable useful to us in carrying than combine our discussion of the proposition perhaps give us the of the revised Coal

#### MR. WILSON-

tee to recommend. The Committee united with all the members from one. I got so gentlemen interested tically, nothing was before the meeting. posed law which re and perhaps not v should not judge it



persistent agitation for change. And in the minds of many, our Mining Law is wholly inadequate.

Therefore, every effort of every friend of the industry in this Province should be directed towards having the law settled once and for all. There is perhaps nothing so important about the Law of Mines as to get clear of the notion that upon it will depend the future of the mining industry of the Province. The mineral industry of this Province must depend for its successful development upon the faith of our own people. Let our people once make up their minds that their prosperity depends upon their efforts to develop the marvellous mineral wealth of the Province, and then we may expect Government interest and aid, the assistance of the foreign investor; in a word, we may expect Nova Scotia to continue to hold the proud position she indisputably holds to-day, of being the leading mineral Province in this great Dominion.

#### DISCUSSION.

THE PRESIDENT—You will agree with me that the paper is a very valuable one, and contains many hints which will be useful to us in carrying on our discussion. We could not do better than combine our discussion of the paper with the general discussion of the proposed revision. Those interested in gold will perhaps give us their views. Unfortunately, we have not a copy of the revised Coal Regulation Act.

MR. WILSON—I was appointed a member of the Committee to recommend changes desirable from a miner's standpoint. The Committee unfortunately was too large. I communicated with all the members, but I regret to say I only got a reply from one. I got some very good suggestions from one of the gentlemen interested in coal, in regard to our gold mines. Practically, nothing was done, and there is really no report to put before the meeting. I have looked over the part of the proposed law which refers to gold mining. It is badly mixed up, and perhaps not very carefully drawn. Perhaps after all we should not judge it too severely wherein it does not meet with

our views. One thing that struck me was in regard to the size of the area. The Mines Act provides that it shall be 250 by 150 feet. That I think has been considered entirely too small. Of course, the matter has been remedied to a certain extent by the provision which compels an applicant to take up six areas at a time. Why not make the size of an area equal to six of the present ones?

There is another thing to which I would like to call the attention of the Society. Section 161 makes not only the mill owner, but every employee as well, liable in case the regulations in regard to mills are not carried out. It is rather severe that every workman should be obliged to ascertain whether or not the mill has a license. If he sought that information from his employer he might be discharged for impertinence. Whilst the owner or agent should be made responsible, I think the portions of the section affecting any others should be struck out.

I would also call attention to clause 155. It does not state that bondsmen are necessary. If there are to be bondsmen, they should have some protection in the way of notice that the proper returns have not been made. The law provides that returns shall be made monthly, but instances are known where persons have been called upon to pay royalties accruing over three years, which were not demanded by the Government until some change, such as disposal of the mill, had occurred.

MR. FERGIE—They are easier on the gold miners than on the coal men.

MR. WILSON—I can state that there was a mill running crushing quartz in this county for five years without paying royalty, and they did not come down on the bondsmen because the bondsmen had gone to Africa. I consider that a bondsman has certain rights as well as the Government, and that if the Government fail to report to him after three months that the royalties have not been paid, he should then be in a position to take action which would relieve him from his responsibility. At all events, he should not be liable for any claim over three months' standing.

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MR. AUSTEN—I have a case in point. I have received notice from the office that I am a bondsman, and that they look to me for \$2,000.00. They say I am liable under the bond for the penalty, and I have not the means of knowing whether the owner should have made returns or not.

MR. MCNEIL—You are only liable for the amount due.

MR. AUSTEN—I cannot determine the amount due.

MR. WILSON—Last year they got out an alluvial lease. I see that a person can take up 500 acres, and then after his experimental term has expired he can make an application by payment of \$250.00, which seems to be a pretty good fee. There is something to be said as to whether these leases are forfeitable for non-working. From section 150 one would infer that they were forfeitable for non-working.

There are a good many things in the law that from my standpoint I think could be improved, but still when you get one thing improved perhaps you are intrenching on another. The points I refer to I think are important.

MR. AUSTEN—With regard to forfeitures, I think that persons entering into a bond for others should have some little show. I had no means of knowing whether at this particular mill the returns had been made for the last month, the last year, or the last ten years, but I find that they have not been made for a considerable time. I have no doubt I will get out all right, as my man is a very good one and a member of this Society.

MR. ARCHIBALD—I must confess to not having examined this new law with great attention. I have been much pleased with the paper read, and I would move a vote of thanks to Mr. McNeil. It is regrettable that there are not more members present. There are some absent who always take a great interest in the laws relating to mining, and they should be here this morning to discuss the subject. It is a question whether it would not be as well to have this discussion adjourned. The best way would be to make an outline of the different points for discussion and take them up one by one. Then the discussion

would be more intelligible. I move a vote of thanks to Mr. McNeil for the able paper read.

MR. WILLIS seconded the motion, which was put and carried.

MR. WILLIS—There are two matters about which I would like to say something. One is in regard to the size of the area. I think the time has come in Nova Scotia for the size to be increased. If you look at the mining map of any district you will find that it is cut up into a number of leases of one area each. Under this law a man takes a prospecting license say for fifty areas. At the end of the year he takes up six areas under lease, and up to a short time ago he could take up one. If a man wants to buy a property, he has to buy up a large number of these areas. Six areas are too few to allow anyone to take up at one time. In other countries the areas are 1,000 by 1,500 feet along the vein, and no man should have an opportunity to take up these small blocks.

The other remark I wished to make was in regard to the rental. Before the law was changed, which was I think in 1892, a man who was working a mine actively could commute his labor. So many days work in each year were required to be done per area, and if this provision was complied with for ten years, that was sufficient to make the lease non-forfeitable for the balance of the term. At the Oxford mine fifty times the amount of labor required was done in the first five years, and Mr. Reid took the lease to the Commissioner, who put a clause in it making it non-forfeitable for the remainder of the term. Could we not have a provision under the present system of rentals by which a man paying a lump sum in advance, could have his lease made non-forfeitable?

MR. FERGIE.—Would they not say that you were locking up that property?

MR. WILLIS.—If a man paid a lump sum in advance they would have the use of the money for twenty or forty years, as the case might be.

MR. FERGIE—rental.

MR. WILLIS.—you get it back if the year.

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MR. FERGIE.—If you are paying royalty that pays your rental.

MR. WILLIS.—You have to pay your rent in advance, and you get it back if you do the stated amount of days' labour for the year.

MR. FERGIE.—Our lease says it shall be forfeited if the rent is not paid. We pay our royalty every three months.

The Act speaks of the magnetic meridian. I think the base lines should be the true meridian.

MR. WILLIS.—The reason of that is because they cannot lay out the true meridian. An amendment was passed some five years ago substituting the true meridian. They tried it for one year, but not having a man competent to lay it they repealed the amendment the following year.

One word more in regard to the size of the area. There is no reason why these areas should be laid 150 feet east and west, and 250 feet north and south. The longest way should be on the lead. In Cow Bay all the leads run north and south, and they have the long way there. In the United States the areas are 1,500 by 1,000 feet, and they have to remain that way. The sections between areas can be taken up.

MR. WILSON.—In section 158 the royalty is placed at two per cent. on silver at one dollar per ounce, which makes it about four per cent.

MR. POOLE.—One difficulty I see in the way of changing the size of the areas is this. There are so many taken up under the present arrangement that a change would lead to confusion.

The magnetic meridian of twenty years will not be the same as to-day, so that the standard line will have to be implied.

Section 193 speaks of "other materials," and yet there are only six or eight minerals retained by the Government, and they are all mentioned there. It seems to be the idea in this Province that if we only have legislation everything will run itself, and that no official need be appointed to carry it out.

On motion, the following gentlemen were appointed a Committee to wait on the Committee of the House, when the proposed Mining Act comes up for consideration, and present the views of the Society :—Messrs. Poole, McNeil, Wilson, Willis, McInnes, and Graham Fraser.

A short paper by Mr. J. G. Rutherford was read, entitled

#### UNEXPECTED RESULT OF A SHOT.

A shift consisting of two miners and a helper are driving one of a pair of levels in a seam of coal at the Albion Mines. The levels are 9 feet wide by 8 feet high, in coal of a superior quality, though of a strong nature. A brattice of  $\frac{1}{2}$ -inch boards nailed to props is carried at about 3 feet from the high wall to within 12 feet of the face. Props are also set against the high wall at intervals of 4 feet, with the two-fold purpose of supporting the roof timber, and by the intervention of slabs preventing the sides from spawling. The seam at this particular spot dips at an angle of about 22 degrees.

The explosive used in getting the coal is called flameless powder : is made up in stout paper cartridges of specified capacity, and is manufactured by the Acadia Powder Company, Halifax.

All shots are fired by electricity.

A few days ago the men went to work as usual, but before going to the face disposed of their superfluous clothing in manner following. The helper or loader hung his solitary coat to a nail in a prop. Brown, one of the miners, wore, in addition to his ordinary jacket, an overcoat, and divested himself of both garments at the same time. In the righthand bottom pocket of the overcoat there were three detonators, or caps, as the men call them, with 48 inch wires, and in the outside breast pocket on the left side there was a 9 oz. cartridge of F. P. The coats thus taken off were folded inwardly and placed over a slab immediately in front of a prop, and quite close to the helper's coat.

It is not clear that Brown laid his garments over the slab

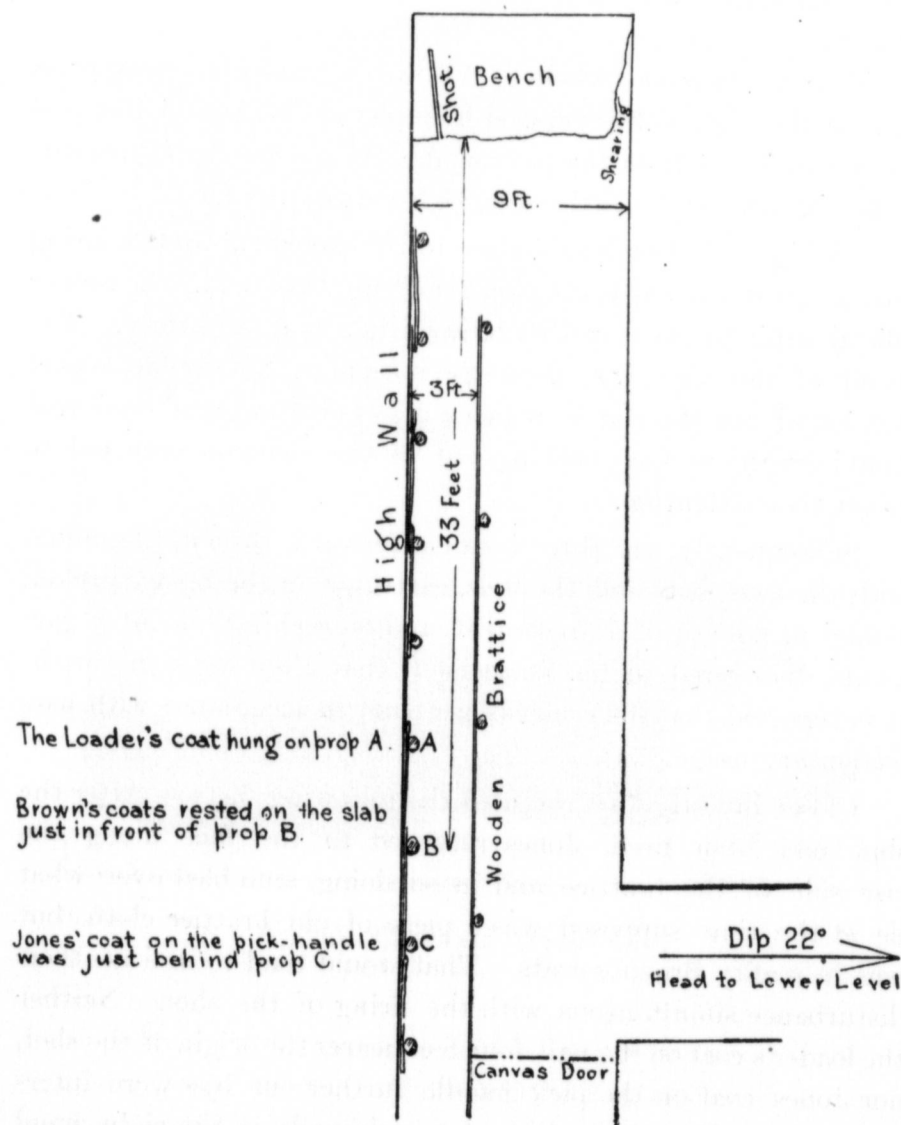
Plan of  
the cl

The Loader's coat hung

Brown's coats rested on  
just in front of prop

Jones' coat on the pick  
was just behind prop

Plan of Level shewing the position of  
the clothing before the shot was fired.



with the cartridge projecting from the breast pocket uppermost, but the most natural assumption would be, that in order to avoid damage to it by the weight of the coats, it would be placed in that position.

Jones, the other miner, hung his coat with 18 ozs. of F. P. in the pockets over the handle of a pick leaning against the high wall, and sheltered by a prop just four feet out by of Brown's clothes.

Thus we have the whole of the men's garments on supports against the high wall separated by intervals of about 4 feet, and from 2 to 3 feet from the pavement. All are on the return side of the brattice and a little over 30 feet from the face.

A high side bench shot close to the pavement and pointing almost directly towards the men's clothing was fired by the proper official, after the men had withdrawn to a place of safety. The result of the shot was perfectly normal. No double report was heard, nor the clatter which a heavy discharge of small coal would create, in fact, nothing out of the common occurred to arrest their attention.

Subsequently, say three hours afterward, Brown, the miner, with the two coats and the 9 oz. cartridge in the breast pocket, retired in pursuit of refreshment, and on seeking his outer garments, discovered to his amazement that they were in shreds. It is reported that his remarks were not in accordance with parliamentary usage.

Closer investigation revealed the following facts:—After the shot had been fired, Jones returned to the face along the rise side of the brattice, and in so doing, stumbled over what he at the time supposed was a piece of old brattice cloth, but was in reality Brown's coats. That would tend to indicate their disturbance simultaneous with the firing of the shot. Neither the loader's coat on the nail, four feet nearer the origin of the shot, nor Jones' coat on the pick handle further out by were interfered with. The three detonators originally in the right hand pocket of Brown's top-coat were found on the pavement uninjured, but the 9 oz. cartridge in the left breast pocket had





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MINER'S CLOTHING AFTER SHOT.

disappeared. The paper end of a cartridge was found close to the spot, and together with the damaged coats is herewith presented for exhibition.

The questions that naturally arise are, what destroyed Brown's coats? Was the cartridge in the pocket detonated by a violent blow from a fragment of coal or pyrites which is present in the seam, or was the damage inflicted solely by a discharge of small coal from the bench shot?

In the former case one should expect to find some injury to the support upon which the coats rested, and in the latter an accumulation of small coal might be looked for. Besides, how could the loader's coat escape injury from violently impelled fragments of coal.

The writer personally examined the locality and failed to find indications of either one or the other, but indentations such as could be made by impact with small coal, and on a level with the coats, were discernible upon the prop against which they rested.

On examination the coats show that the left side received most injury, and there is no indication of burning.

An experiment was carried out on the surface by exploding a 9 oz. cartridge in the breast pocket of a coat placed to represent the conditions prevailing at the time of the actual occurrence, except that a small book was placed in the right hand pocket in lieu of detonators. After the explosion, the appearance of the coat did not differ materially from that observed in the case of Brown: the left side sustained most damage and the book was in the pocket unharmed.

The facts are presented for what they are worth, and the writer, while leaning to the opinion that the cartridge was by some means exploded, leaves it to the better judgment of his fellow members to say what became of the mysterious nine ounces.

#### DISCUSSION.

MR. FERGIE—The accident is a peculiar one, probably the first on record. The question is, whether it occurred by concussion or direct impact of coal from the face. Perhaps we

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#### DISCUSSION

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could not do better than ask Mr. Wilson, who knows more about that powder, to tell us something about it.

MR. WILSON—The investigation seems to have been very thorough, and from my knowledge of that powder and of the ingredients, I would infer from the description here given, that it has been the result of impact of a piece of coal or other material from the face. It would be pretty hard to get that powder exploded by concussion; we have laid one cartridge within two feet of another, and tried that. In that case we have not found that an explosion occurred, but we have found that direct impact will set it off, for instance, a bullet from a gun.

MR. FERGIE—Would it be possible for one of these cartridges to explode by the roof falling on it?

MR. WILSON—I would say not, as the roof falls from a small distance, and does not get up sufficient speed.

On motion the meeting adjourned until 3 p.m.

#### AFTERNOON SESSION.

MR. FERGIE—I have here a telegram from Mr. Stuart re the carrying of explosives on the I. C. R. The question is, whether or not we should petition the Government in regard to the matter.

MR. WILSON—Our Company has been in correspondence with the Railway Department during the past month in regard to carrying dynamite—rates, conditions, etc., and it took considerable time to get a definite answer. When we did, it was "No." We withdrew from any further correspondence in the matter.

#### DISCUSSION ON MR. ALEX. McNEIL'S PAPER.

(CONTINUED.)

MR. FERGIE—There have been two or three opinions as to the size of the areas. Mr. Willis thought they should be increased to 1,000 by 1,500 feet.

MR. HAYWARD—I agree with Mr. Willis that it would not be too large, and it would be of more benefit to those taking up claims for the sole purpose of working.

MR. WILSON—I concur in that view, but the question will arise how the Government will appreciate that. It might cut off their revenue. When a man has to take such a large amount and has to pay a proportionate price for the large area, it is going to cut out a great many small investors. They are a kind of milch cow for the Government, and it is a question whether they would receive the thing very kindly or not. The principle, however, is undoubtedly sound.

MR. POOLE—My view is, that although I think the areas too small, owing to the trouble of making the change and the slowness with which the change could be inaugurated, we should rather work for the maintenance of established rights.

MR. HAIGHT—By blocking smaller areas into the larger, the areas might be limited.

MR. FERGIE—Mr. Andrews intended to advocate bondship in some company instead of individual securities. I would like to call the attention of the Society to Section 184.

MR. MCNEIL—The provision I mentioned in the Dominion Coal Company's lease would limit that.

MR. FERGIE—Mr. Willis has suggested that by paying a sum down, your property should be non-forfeitable.

MR. MCNEIL—There should be no such thing as forfeiture outside the terms of the lease.

MR. FERGIE—We seem to be unanimous about the base line, that it should be the true meridian. Mr. Andrews called my attention to the fact that the section as to the division of property is not in the draft. If there was any intention of altering it, he said he did not think it should be altered.

MR. CARRUTHERS asked what provision there was for the filing of plans and workings of mines.

MR. POOLE—There was a provision for the filing of plans showing the depth and extent of the workings of all gold mines,

but it entailed it was struck out of the Government to be supplied by the Government. The Government motion was

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but it entailed too much trouble on the Mines Department, and it was struck out of the Act. It would be well to ask the Government to restore that clause of the Acts of 1895 which compelled maps of the extent and depth of the workings to be furnished to the Government. I move that the Committee ask the Government to restore clause 5 of the Acts of 1885. This motion was seconded by Mr. McNeil, and passed.

MR. FERGIE—Are Government officials allowed to act as consulting experts and use information they get as officials?

MR. AUSTEN—That is a new clause which was put in a few years ago, in view of the case of Mr. Fairbanks.

MR. MCNEIL—They were held to be entitled at that time, but made a mistake in taking out the lease, and this clause was inserted to make it clear that they could not take up areas.

MR. FERGIE—I think it should be distinctly understood that they be not allowed to take fees or give information of any such kind.

MR. POOLE—The following should be inserted: "Nor shall they receive any fee or consideration of any sort for services or information relating to mines or mining properties in the Province."

The latter part of section 17 should be modified to read "as between the Government and the lessee himself only."

MR. MCNEIL—There is no provision in section 105 for renewing.

MR. FERGIE—Would it not be better to add—"with the option of renewing."

MR. FERGIE—What is the general opinion as to interfering with the size of the area?

MR. AUSTEN—I do not think it should be interfered with.

MR. FERGIE—I take it that this clause should not be interfered with. I think it is a mistake to make recommendations unless they are absolutely necessary.

MR. MCNEIL—I think it would be well if there is time

before the revision, for the Society to obtain the report of the Commissioners of Queensland in regard to this matter.

MR. WILLIS—With regard to a gold mining lease covering all the minerals contained in that block of ground, it seems to me that this is a matter demanding attention. A man may take up gold areas and there may be next to his quartz a vein of iron or copper. There is nothing to prevent somebody covering his area "for other minerals." On page 23 of the Act of 1896 there is a new feature in regard to taking up alluvial ground. It seems to me that the only way to settle it is to enact that if a man takes up areas for gold his lease should cover all minerals.

MR. MASON—As a matter of fact the Government would not give a license to search for other minerals over a lease.

MR. McNEIL—The clause I referred to in the lease of the Dominion Coal Company would cover that, and should be embodied in all leases.

MR. POOLE—I am of the opinion that the "working" clause should be re-inserted in the Act.

MR. FERGIE—I take it that is the voice of the meeting.

MR. McNEIL—If you have that provision, you must have regular inspection.

MR. POOLE—We suggested inspection to the Government a year ago. They did really mean to appoint an inspector, but there was such a host of political friends after the position that they could not give it.

A letter from the Federated Institution of Mining Engineers was read, inviting this Society to become a Corresponding Society. A communication from the Incorporated London Chamber of Miners, regarding a proposed Mining and Metallurgical Exhibition in London and the affiliation of Mining Chambers, was also read.

On motion, both matters were deferred until the Annual Meeting.

The meeting then adjourned.