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CIRCULATION.

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CONTENTS.

CO-OPERATION IN MINING.

In a thoughtful and frank paper, reprinted in this number of the Canadian Mining Journal, Mr. W. H. Prest analyzes the present condition of gold mining in Nova Scotia, and suggests as a tonic certain forms of co-operation.

"For two generations," says Mr. Prest, "the gold miners of Nova Scotia have struggled, each one for himself. . . . . without organization, without sufficient funds, and without that patriotic feeling for the industry we represent, which, once expressed in energy would place gold mining in Nova Scotia in a respected footing. . . . . And while we watch our province gold yield is dropping year by year and we are unable to stop it."

Mr. Prest then traces, picturesquely enough, the unrealized dreams that have been indulged in by "editors, politicians and mining men," and evolves the following diagnosis. The causes of the decline, he states, are:

First, not want of capital, but lack of confidence.
Second, want of knowledge and skill in the workmen.
Third, want of funds by the actual owners.
Fourth, want of co-operation between the capitalists and the prospector.

Instances are not lacking all over Nova Scotia of work badly done, of locations foolishly chosen, and of the stoppage of prospecting in the verge of success. As for the larger incorporations, these have uniformly suffered from the fact that while controlled from inside, their financial support had to be sought from outside.

All this being so, Mr. Prest urges co-operative efforts in certain directions and within certain limits. Emphasis is laid first upon the open valuation of mining property as a preliminary to capitalization. "Mere extent of territory counts for little," Mr. Prest wisely asserts, "where the principal criteria in selection are the quantity and the importance of rich 'float.'" The chief points to be considered, therefore, in placing a value upon a Nova Scotian gold property, are as follows:

First, the determination of the quantity of gould-bearing boulders, and the preparation of a plan shewing the distribution of these and of all gold-bearing quartz found. Panning results should also be mapped.

Second, the maximum value and the quantity of rich "float" should be estimated as closely as circumstances will permit. This can be done but roughly; nevertheless, it is thought by Mr. Prest to be of great importance.

Third, the position, character, and size of the drift boulders indicate the character of the vein. Giving due

weight to post-glacial changes, much can be learned of the vein itself.

Points Four and Five deal with the same indications of value.

Sixth, the presence of heavy overburden is not necessarily a deterrent. Only when prospecting is carried on without system will the depth of cover be a serious factor.

Seventh, the possibility of drainage should be well considered.

Eighth, the possession of water-power is often of vital consequence.

Ninth, the saving implied by the use of water-power should be measured in terms of steam-power.

Tenth, the accessibility of the mine is sometimes in Nova Scotia a serious item, and the possible need of building roads will, naturally, affect its value.

Mr. Prest then further suggests that all employees should become shareholders in the mine where they work. Gold-mining is not competitive; but knowledge and co-operation are much needed in the small mines of Nova Scotia. Intimate knowledge, for instance, of post-glacial geology is a *sine qua non* for the prospector. And the workman, who often farms, lumbers, and fishes in addition to doing a little mining, requires a direct inducement to keep him at work.

Mr. Prest's suggestions amount broadly to this,—let the operators pool their knowledge of the country and of the industry, give the miner a tangible and fixed interest in the mine, and the spirit of co-operation will at least have been generated. To an extent it will be possible to control valuation and capitalization. The mining fraternity, working as a unit, can accomplish these things and many more.

GEOLOGICAL SURVEY SUMMARY REPORT.

The summary report of the Geological Survey Branch of the Department of Mines, for 1911, is the most comprehensive yet published. Although, for sufficient reasons, it makes its appearance very late in the year, the character of the report itself compensates in a measure for this delay.

The Survey staff now includes 40 technical officers, 13 draughtsmen, and the necessary complement of stenographers. There are also an official photographer, a librarian, taxidermist, a collector, and several special clerks, etc. The total grant for the year ending March 31st, 1911, was $381,889, of which an unexpended balance of $120,594.81 remained unexpended at that date, and lapsed. The seeming anomaly was, no doubt, due to the fact that the arbitrarily fixed fiscal year does not correspond with the calendar year.

The field work during 1911 was conducted by 30 geological parties, and six topographical parties. The expenditure in each Province is given herewith:

Explorations in British Columbia	$26,352.37
Topographical surveys in British Columbia	39,766.30
Explorations and surveys in Ontario	10,770.60
Explorations in Quebec	4,904.39
Explorations and surveys in New Brunswick	6,203.45
Explorations in Nova Scotia	4,549.49
Explorations in North-West Territories ...	8,710.84

It will be noticed that British Columbia gets nearly two-thirds of the whole sum expended in field-work. While allowance must be made for the fact that long distances must be covered and heavy expenses incurred in geological investigation or topographical surveying in British Columbia, yet the disparity between the expenditures in the west and in the east is too marked. Quebec, New Brunswick, and Nova Scotia are more in need of attention than ever before.

In his introductory remarks the Director refers feelingly to the deaths of Dr. R. W. Ells and Mr. R. L. Broadbent. The former had been in active service for no less than 39 years. The latter was largely responsible for the excellent mineralogical exhibits now housed in the Victoria Museum.

Reference also is made to the resignation of Mr. J. A. Dresser, who accepted a very responsible position with a mining corporation. The Director lays stress in mentioning this resignation upon the urgent need of higher salaries and more rapid promotion. He points out that the loss of such an experienced officer is irreparable. However, as the Survey continues to be absolutely removed from political and other undesirable influences, and as it has a considerable body of well-trained young geologists and topographers to draw upon, its general position is healthy.

One important event during the year was the acceptance by Dr. Charles D. Walcott, secretary of the Smithsonian Institution, of the honorary position of Collaborator in Geology. This insures co-operation whenever necessary between workers on both sides of the boundary.

. . . . .

In the report before us several important papers are presented in fuller detail than has hitherto been usual. Quartz mining in Klondike district, mining in Portland Canal district, the geology of Nelson map-area, the progress of clay investigations, placer gold in Quebec, the gypsum of New Brunswick ,the gold-bearing series of the Midway Basin, N.S., are among the subjects treated at length .

The Summary Report for 1911 may fairly be described as a comprehensive and satisfactory publication.

NICOL HALL.

The formal opening of the Kingston School of Mining's new Mining and Metallurgical Building took place on October 16th. A description of the building will be found elsewhere in this issue. We wish here to congratulate the School upon this much-needed addition to its equipment. We desire also to place on record our appreciation of Professor William Nicol's devotion and generosity. Without Professor Nicol's munificent financial aid, or, in fact, without his unceasing labours in every direction, the erection of the new structure

would have been delayed for years. The School of Mining would not then have been able to perform the functions that it is supposed to perform.

Most appropriately is the new building named Nicol Hall. It will be an enduring reminder of one man's loyal service to the institution.

But Professor Nicol himself would be the last man to desire that his services should shut from view the equally consistent labours of his associates. The director and all the professors have never spared themselves in working for the School of Mining.

A NEW TIN PROCESS.

An Australian, Mr. Arthur Richards, who is manager of the Cornwall Tailings Company, is experimenting successfully with a process whereby almost 100 per cent. of the tin in old tailing dumps or in fresh ore can be extracted at a low cost. At present, the usual practice permits of a recovery of not more than 60 to 75 per cent. of the tin. Hence, Mr. Richard's process will mean much to Cornish operators.

Mr. Richards mixes the crude ore, or the residues, with small proportions of cheap coal, salt, and a chemical unspecified. The tin is volatilized as tin chloride and collected in a chamber. It is claimed that practically none of it is lost.

As heretofore it has been possible to extract not more than from 30 to 50 per cent. of the tin left in old tailings, it will be seen the process will be of utmost importance from this point of view also.

THE C. M. I. WESTERN MEETING.

The Canadian Mining Institute recently held its first general semi-annual meeting in the West. The experiment was entirely successful and in future the western meeting will be a regular event. As is the case in the United States, the mining interests in Canada are very diverse; they are also spread over an enormous area. The problem of distances alone in a formidable one, in its relation to the general efficiency of the Institute. It has been solved to some extent by the organization of branches. But for the establishment of the Western Branch some few years ago it would have been difficult to have retained the interest and co-operation of western members in the work of the society. The present provision for a general meeting annually in the West will further stimulate interest, while having the important effect of strengthening the bonds of union between the eastern and western membership. It will, moreover, enable western members to participate more directly in the administration of the Institute's affairs, since they will now be afforded the opportunity of expressing their views as a body on any question of general policy. One outcome of the Institute's meeting at Frank was the organization of a strong branch for Southern Alberta. Another branch will, it is hoped, be established shortly in the north. These branches should serve a most useful purpose, not only in bringing coal operators in closer touch with one another, but in voicing the views of the mining men of the Province concerning legislation, intimately affecting their interests, which it is the intention of the Provincial Government to introduce in the near future.

EDITORIAL NOTES.

We hardly take to the idea of having the La Rose cash surplus, which amounted to about $1,500,000, handled by the Canadian Mining and Exploration Company. The latter company has ample money of its own to invest. It seems to us far better for La Rose to take care of itself.

The discovery of a rich vein of niccolite and smaltite, carrying from 4,000 to 5,000 ounces per ton, under Cart Lake, Cobalt, is one of the most significant occurrences. It will have the effect of placing the Seneca-Superior Company on the list of next year's producers, and will lend much encouragement to such mines as the Provincial.

The total average working cost of ore mined and milled at the El Oro mine, during the year ending June 30, 1912, was $3.79 per ton. This includes a development charge of 65 cents per ton ,and 23 cents per ton for Mexican, State and Federal taxes. Due in part to disturbed political conditions, mining costs exceeded those of the previous year by 34 cents per ton.

SPECIAL CORRESPONDENCE

MORE HISTORY.

Editor, Canadian Mining Journal:

Sir,—In the special issue of your periodical (July 1, 1912) in an article entitled, "The Special Research Work of the Mining Department of McGill University" the statement appeared that "McGill was the first of the Canadian Universities to give instruction in mining and metallurgy as a regular course in 1871." Commenting upon this your footnote mentioned that "Queen's University will dispute this statement." Your briefly worded, but pointed prophecy, has proved true, for in the last issue of the Canadian Mining Journal (Oct. 15, 1912, p. 699), under the heading "A Matter of History," Dr. W. L. Goodwin takes grave exception to this as "an extraordinary statement" and writes that "the facts are that up to 1893 no practical provision had been made anywhere in Canada for education in mining and metallurgy."

After an examination of the complete records the writer of this communication finds that the original

statement was correct. The course in mining at McGill University was established in 1871 and was therefore in full operation for 22 years prior to 1893. The late Dr. B. J. Harrington was appointed to take charge of the course; later he was assisted by J. Fraser Torrance, who had received a special training at Freiburg, and by W. A. Carlyle. The first graduate in mining was J. Fraser Torrance, B.A., who received his degree in 1873 after a three years' course. In 1873 the course was lengthened to four years. Upon his appointment Dr. Harrington secured a complete set of appliances such as were then considered essential from a practical standpoint to illustrate what was even then considered a very important course. Mining models and diagrams were provided and an extensive suite of specimens of ores and metallurgical products were collected or purchased and placed in convenient places for reference and inspection. Ore dressing laboratories alone were lacking to complete the equipment in a modern way for teaching mining and conducting the necessary research work. From 1873 to 1892, both years inclusive, there were 22 graduates in mining, among whom may be mentioned the following: W. Fleet Robertson (1880), Provincial Mineralogist of British Columbia; Dr. Albert P. Low (1882), Deputy Minister of Mines for Canada; W. H. Howard (1883), American Smelting & Refining Company, Garfield, Utah; E. P. Matthewson (1885), who, as manager of the reduction works of the Anaconda Copper Mining Company at Anaconda, Montana, has probably the foremost position in the smelting industry of the United States; Prof. W. A. Carlyle (1887), Professor of Metallurgy, Imperial College of Science and Technology, South Kensington, London, England; W. F. Ferrier (1887), formerly geologist to the United States Smelting & Refining Company, and now general manager of the Natural Resources Exploration Company of Canada; C. H. Macnutt (1888), General Manager Poderosa Mining Company, Antofogasta, Chili; C. B. Kingston, of Lewis & Marks, Johannesburg, Transvaal, S.A.

Indeed, I think it may be said without fear of contradiction, that during a similar period no mining school in North America has produced so large a proportion of graduates who are occupying the highest position in the mining and metallurgical professions. Honour to whom honour is due.

Yours truly,

ALFRED E. BARLOW.

Westmount, October 20th, 1912.

POTASH, SILICA AND ALUMINA FROM FELDSPAR.

By Edward Hart.

Paper presented at the Eighth International Congress of Applied Chemistry, New York, 1912.

In a study of the commercial utilization of feldspar, which I undertook several years ago, it soon became evident that the potash alone would not pay the cost of extraction. This is the cause of the commercial failure of all the methods heretofore proposed. It is necessary, therefore, to separate and put into marketable form other constituents—silica and alumina—if our method is to be successful.

With this purpose in view I have finally worked out the following process which gives good prospect of commercial success:

The feldspar chosen should contain not much less than 12 per cent. potash. Spar of this quality can be obtained in quantity, but one of the pitfalls inventors must avoid is the expectation of getting spar containing the theoretical 16.9 per cent. of potash. The spar mixed with the proper amount of potassium sulphate and carbon is fused. The carbon added is so regulated that the resulting slag contains a considerable proportion of sulphids. This has the double advantage of saving a part of the sulphur, disengaged as hydrogen sulphide on dissolving in acids, which aids also in the complete decomposition by breaking apart the particles as it is given off. Experiments show that if a colourless slag is obtained of even higher alkali content it is much less easily decomposed by sulphuric acid.

The slag so obtained must be very finely pulverized and treated in closed vessels with dilute sulphuric acid, leaving behind a very pure silica which only needs washing and ignition to yield a marketable product fitted for the potter's use or for the manufacture of sodium silicate.

The solution contains potash, alum and any small amounts of other metals such as iron, manganese and soda as sulphates. Lime is inadmissible, as the sulphate forms crusts on evaporating.

The solution on cooling gives at once crystals of alum, which washing with a little water and centrifuging renders marketable. Any iron present remains as ferrous sulphate in the mother liquor. Alum, however, is marketable only in limited quantity and must be, for the most part, converted into its constituents, aluminum and potassium sulphates. This is easily done by adding to the solution in a closed vessel potassium sulphide in slight excess when aluminum hydroxide mixed with a little sulphur precipitates in a form easily washed. This is dissolved in hot sulphuric acid, run through a filter and allowed to solidify. The potassium sulphate is obtained by evaporation.

Each ton of feldspar (12 per cent. K_2O) should yield:
444 lbs. K_2SO_4.
2,040 lbs. commercial aluminum sulphate (18% Al_2O_3).
1,300 lbs. SiO_2.

PUBLICATIONS RECEIVED.

Statutes of Canada—1912—Acts of the Parliament of the United Kingdom of Great Britain and Ireland passed in the Session held in the First and Second Years of the Reign of His Majesty King George V.—Imperial Orders in Council and Treaties Negotiated and Public General Acts, and Local and Private Acts of the Canadian Parliament—Ottawa, 1912.

The Quarterly of the Colorado School of Mines—October—1912—Issued by the Colorado School of Mines, Golden, Colorado—Contains an instruction scheme of classification for applying to mining information.

Electrical Symbols for Mine Maps, by H. H. Clark—Technical Paper 22—Bureau of Mines, U. S. Department of the Interior—1912.

Report of the Department of Mines, Western Australia, for the year 1911—Perth, 1912.

Statistics of the Clay-Working Industries in the United States in 1911, by Jefferson Middleton—Advance Chapter from the Mineral Resources of the United States for the year 1911, Washington—1912.

LITERATURE AND MINING.

A Lecture Delivered Before the Engineering Students of the University of Toronto, by J. C. Murray.*

The relation of literature to mining has always been unsatisfactory. Although the literary workers of the past and of the present owe much to mining that debt has neither been paid nor recognized. The existence of this debt needs no proof. I need only mention one of the several devices whereby ingenious authors relieve impecunious heroes. The English novelist creates rich gold mines in vague Australia; the American novelist usually prefers the Western States. However, there appears to be a well-grounded belief in certain literary circles—manufacturing circles is a better phrase, for the average novel is truly a manufactured article—that mining is the only honourable means whereby a man can become suddenly rich without selling his soul. And there is some real basis of fact behind this. Hence it is that in the pages of modern fiction many scores of bronzed, bearded, brawny lovers have returned from Australian "diggings" to crush their usually anaemic betrothed in their yearning arms. So, also, mining endows many a deserving character in fiction with unhoped-for affluence. Usually both authors and readers can lay claim to a profound and absolute ignorance of everything pertaining to the industry. This seems to apply even to the few authors who have written novels that purport to be devoted to mining matters. I remember one novel, the scene of which was laid in the Coeur D'Alenes. The author was—perhaps is yet—a lady. She set herself calmly to work to disorganize the bowels of the earth. She controverted all the fundamentals of geology, and introduced radical changes in stamp-mill practice. I remember that the stamps of a 10-stamp mill were described as weighing hundreds of tons. This sufficiently shows the degree of accuracy that can be expected from the lay writer.

The time has come when better things can be hoped for. Ten or twenty years ago the mining engineer was regarded (and here I use a cheerfully contemptuous phrase coined by an English professor occupying an important chair in one of our universities) as an "educated plumber." The phrase loses half its value when it is not pronounced in the ultra-English dialect with substitution of "ah" for "er"—the last syllable.

Times have changed. Even at universities the mining engineer is looked upon as a more or less intelligent person. The public has begun to think well of him and to expect much of him. And gradually, through a series of reactions, the public is becoming better informed as to mining. Hence I believe the day will arrive when aspiring novelists will no longer dare to take undue liberties with the principles and practice of mining. Half a century ago, for instance, Mrs. Humphrey Ward could have misplaced North Bay with impunity. But to-day she is suffering for her lack of consideration. Similarly with mining. The author who can now perpetrate the grossest solecism about mining without suffering for it, will be brought severely to book by the more critical reader of the future.

These generalities, however, are not what I intended to inflict upon you. With some indefinite intention of showing how much to interest him specially the mining man may find in general literature, I begun to throw together a few notes. Lack of time and pressure of work have made it quite impossible for me to put these notes in coherent form. I must ask you to accept them as they are.

Perhaps in any library the department of travel will be found richest in allusions to mining. But many historical works contain much that interests the mining engineer, those of Parkman and Prescott, for instance, being liberally sprinkled with references to mining matters. Search for such references is hardly to be considered a worthy object in itself, but encountering them certainly adds zest to one's reading.

Lately I have been re-reading a few books that occupy places of honour in my small library.

The first book that I wish to glance over is the English translation of one of the greatest books of travel ever written—The Travels of Marco Polo, the Venetian. I may refresh your memories by reminding you that Marco Polo was born in the year 1254. His father and his uncle were dauntless travellers. Together they spent almost nine years in travelling between Venice and Cathay, where they visited the mighty Kubla Khan whom Coleridge immortalized. A vivid imagination indeed would be required to picture the perils and hardships of that long journey into mysterious and unknown regions. It is no wonder that young Marco Polo's ambition was roused by the travellers' tales.

Marco's father and uncle returned to Venice in 1269. They had been commissioned by Kubla Khan to bring back with them 100 missionaries to operate upon the Cathaians. This they could not do without the permission of His Holiness the Pope. It happened that there was a papal interregnum, no successor to Clement IV. having been elected. After waiting for two years for the new Pope, Gregary X., to be elected, the Polos succeeded in getting two Dominicans. The hardships of travel very soon frightened these two worthies, and the three Polos—father, son, and uncle—started without them on their tremendous journey across Asia. Four years it took them to reach Shangtu where Kubla Khan held court. Young Marco Polo immediately achieved popularity and rose in honour and wealth until he became one of the most important men in Kubla Khan's wide dominions. Not until the year 1295, after twenty-four years of absence, did the Polos see Venice again. The book that has come down to us was dictated to a Genoese scribe by Marco Polo during his imprisonment for a political offence, four years after his return. Cameras, note-books and fountain pens were not current in those days. The traveller, therefore, had to trust to his memory. And it takes one's breath away to think that Marco Polo could remember details of his travels so accurately that much of his description holds good to-day.

We have to do, however, with Marco Polo's allusions to mining and kindred matters. It will not be necessary to go farther into biographical details. Chapter IV. of Marco Polo's book opens with a reference to a "rich mine of silver," within a castle named Paipurth in Armenia Major, and closes with a paragraph on the Zorzaman (the Kingdom of Georgia) oil springs—the marvellously rich Baku oil field of to-day. "A fountain of oil," says Marco, "discharges so great a quantity as to furnish loading for many camels. The use of it," he continues," is not for the purpose of food,

*Editor, The Canadian Mining Journal.

but as an unguent for the cure of cutaneous distempers in men and cattle; as well as other complaints; and it is also good for burning. In the neighbouring country no other is used in their lamps, and people come from distant parts to procure it."

It is impressive to learn that the Baku gushers have been supplying the needs of a large population for many centuries. As I do not intend to introduce any statistics into this brief talk, I shall merely state that the Baku fields in Southern Russia are to-day of enormous commercial importance.

The extensive Kingdom of Badakhshan, near the modern Afghanistan is described by Polo as being rich in minerals. "In this country," he writes, "are found the precious stones called balaso rubies of fine quality and great value, so called from the name of the province. They are embedded in the high mountains, but are searched for only in one, named Sekinan. In this mountain the King causes mines to be worked in the same manner as for gold or silver; and through this channel alone they are obtained; no person daring under pain or death, to make an excavation for the purpose, unless as a special favour, he obtains his Majesty's license. Occasionally the King gives them as presents to strangers who pass through his dominion, as they are not procurable by purchase from others, and cannot be exported without his permission. His object in these restrictions," as Polo quaintly expresses it, "is, that the rubies of his country. . . . should preserve their estimation and maintain their high price; for if they could be dug for indiscriminately . . . . . so great is their abundance, that they would soon be of little value." . . . It must comfort the spirit of that departed King to know that rubies are still embarrassingly precious. "There are mountains likewise in which are found veins of lapis lazuli. . . . the stone which yields the azure colour, here the finest in the world. The mines of silver, copper and lead are likewise very productive."

As Marco Polo proceeded through each succeeding province or kingdom he made mental notes of its resources. In many cases, as in that quoted above, he dwells especially upon the minerals chalcedony, onyx and jasper are frequently mentioned. Silver less frequently; but gold is often referred to.

Near the capital city Kain-du in Eastern Tartary, the lake pearl fisheries attracted Polo. Here also the ruler restricted the search for these precious articles for fear of glutting the market. This monopoly and close control of mining was characteristic of the times, and was given the colour of wisdom by the very limited markets.

In consequence of the abundance of gold found in the rivers of the Province of Karazan (the modern Chinese Province of Yun-nan) gold was worth only six times as much as silver. Even then, there was a profitable business in exchanging silver for gold and vice versa in countries where the relative value of each metal was different. Five days' journey westward from Karazan lay the Province of Kardandan. Here is an interesting excerpt:—

"The currency of this country is gold by weight, and also the porcelain shells. An ounce of gold is exchanged for five ounces of silver. . . . . there being no silver mines in this country, but much gold, and consequently the merchants who import silver obtain a large profit." "Both the men and women," adds Polo, "have the custom of covering their teeth with thin plates of gold, fitted with great nicety." A form of vanity that survives to this day and generation.

Perhaps I have quoted enough to show that Marco Polo was consistently interested in the mineral resources of Mediaeval Asia.

I shall pass now to an author of a quite different type and of a later date—Mr. Samuel Pepys.

(To be continued.)

APPARATUS FOR CONTROL OF OVER-SPEEDING AND OVER-WINDING IN WINDING ENGINES.

From the Report of the Western Australia Department of Mines.

The following particulars of some of the appliances recently introduced for prevention of over-winding and of undue speed in winding have been obtained from the patentees and manufacturers, and are submitted in the hope that the information may be of service to mine owners and managers who may be looking for such devices.

Melling's Patent Controller for the prevention of overspeeding and overwinding in winding engines, made by the Worsley Mesnes Iron Works, Ltd., Wigan, England:

"The blue print enclosed illustrates generally the method we use in coupling up our patent controller to steam brake and to the stop-valve, and also shows a general arrangement of a post brake gear, including our patent adjuster for the purpose of taking up the wear automatically on the brake-blocks.

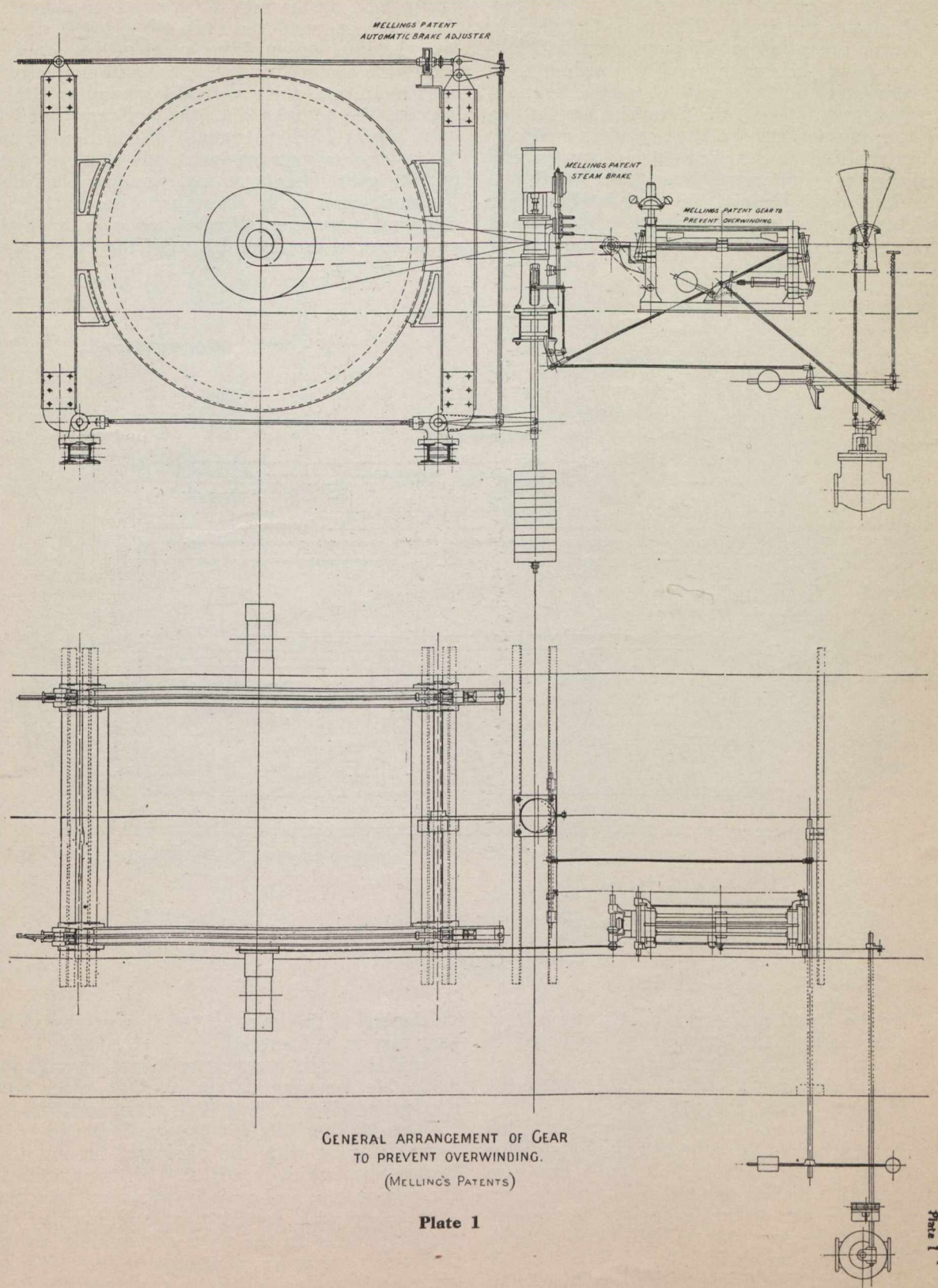
"The blue print referred to is reproduced on a reduced scale as Plate I. herewith, and Plate II, shows the controller more in detail, with letters as in the following description:

"This gear is for the purpose of making safer the working of winding engines—(1.) By providing means for controlling and stopping the engines in the event of the engineman failing to do so at the right time. (2) By controlling the speed of the engines during the wind to that which is fixed to be the maximum. (3) By gradually reducing the speed of the engines when nearing the end of the wind if the engineman has failed to so do. (4) By effectually stopping the engines when the extreme limit of the cage's movement is reached. (5) By stopping the engines at once by means of the emergency portion of the gear, should the engineman start them in the wrong direction.

"The overwinding gear for the above is made by preference in the horizontal type, but can be fixed vertically if desired. The gear can be placed either at the

side of the engines or between them, and can be fixed very readily on the engine-room floor.

"Motion is imparted to the machine from the engine-shaft or drag-shaft, by means of a roller chain and tooth wheels, one wheel being keyed on the crank shaft or drag shaft, and the other wheel being keyed on the shaft B (see illustration). On this shaft B there is keyed a mitre wheel which drives the screw shaft E, and also another sprocket wheel which drives the governor by means of a roller chain. On this screw shaft E is fitted the nut or block F which has on it the raised end pieces or catches F1 and F2. During one wind, this nut F is traversed along the screw from one end to the other. In the illustration it is shown as being mid-way of its traverse, and the notched bar G (which is held in position by the governor) is shown also in its mid-position, as would be the case when the engines were running below their maximum speed. The governor is so adjusted as that the maximum working speed of winding is not sufficient to bring the notched bar G into contact with one or other of the steel catches F1 and F2, but if from any reason this maxi-



GENERAL ARRANGEMENT OF GEAR
TO PREVENT OVERWINDING.
(MELLING'S PATENTS)

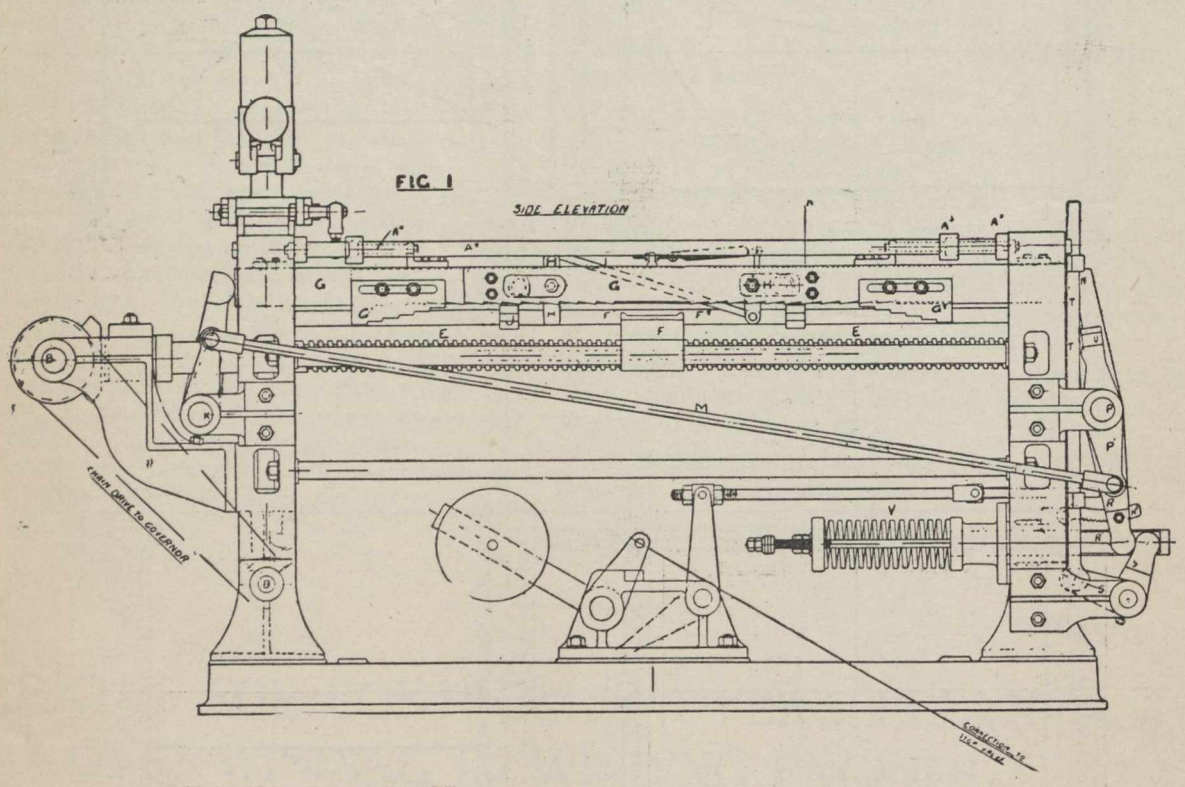
Plate 1

Plate 1.

mum speed is exceeded, the governor rises to its top position, brings the bar G into contact with the catches F1 and F2 on the nut F, and is immediately traversed along the nut. When the notched bar is moved by contact with the nut, this operation immediately closes the stop valve by means of a trip mechanism (shown on the top of the baseplate in the centre, in the illustration) and applies the brake. The period of time in which this latter operation is completed can be regulated so as to bring the brake on with freedom from sudden jar or strain, and the engines can be brought to rest in from, say, three to six revolutions of the drum. If the engines run at their proper ordinary rate, and are checked at the right time, near the end of the wind, by the engineman, the notcher bar G will of course be kept quite clear of the steel catches. Near the end of the notched bar G adjustable step pieces G1 and G2 are fitted, which are for the purpose of slowing down the speed and stopping the engines at the end of the wind, if the engineman has failed to close his stop valve at the right time.

"If desired, the gear may also be made to reverse the engines in addition, when required.

"At the end of the wind, if the engineman has failed to stop the engines before the cage has risen above the fangs or catches a predetermined distance, say two feet, then a bar, O, which is secured to the nut, comes into contact with either of the levers which are connected together by the coupling rod M2. One of these levers P1, i.e., the one which is keyed on the shaft P, has an end, U, which is held in position under a lip or shoulder on the bar T, by the spring V. As soon as the bar O on the nut comes into contact with either of the levers coupled together by M2 it immediately knocks the lever U out of the lip on the bar T and the spring V causes the stop valve to be instantly tripped to its closed position, and the brake immediately applied; this will cause the engines to be effectually stopped in not more than five feet above the ordinary working level. This condition of safety would also be secured if the engines were started in the wrong direction. On the lever R is carried a catch R1, which can be held by the rack R2 for the purpose of keeping the brake on until the rack R2 is lifted up, when, if brought into action from overspeeding only, the bar G and the controlling levers are automatically brought back again into their normal position, and the engineman is free to take his brake off and open his stop valve again. When brought into action by means of the emergency arrangement, all that is required to put the gear into its normal working condition is for the engineman or an assistant to lift up the bar T by means of a spanner, which is made to fit on the hexagonal boss of the lever P1, until the lip T1 again rests on the end of the lever U; the stop valve and brake are then free to be operated.



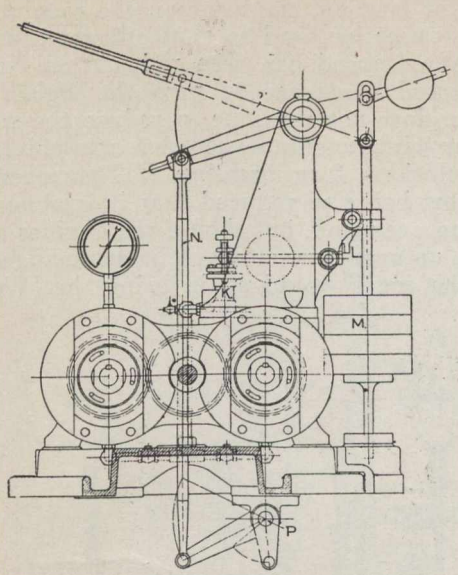
Melling's Patent Controller, for the Prevention of Overspeeding and Overwinding.

Plate 2

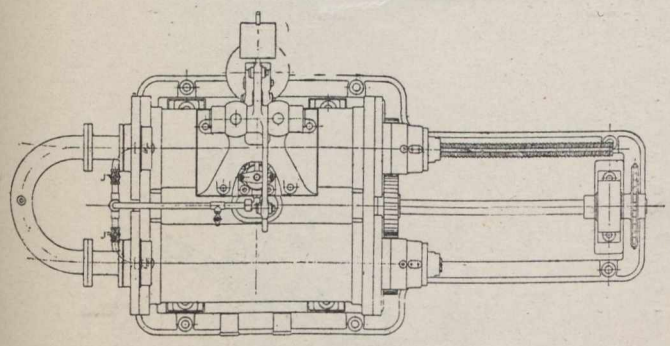
"All the parts are very compact, strong, and easily accessible for examination, and the space occupied is approximately 6 ft. long, 1 ft. wide, and 1 ft. 6 in. high.

"Our Melling's Patent Automatic Brake Adjuster has been designed with the object of having the engine brakes automatically adjusted without attention from the engineman, and as it is important that the brakes should act with certainty and regularity, the brake adjuster takes up the wear as required, so that there is not any excessive movement of the steam brake required at any time to tighten or put on the brakes. The arrangement is constructed so that the actual 'screwing up' of the brake is done during the 'off movement,' much less strain being thus put on to the gear. The movement of two of the posts or straps, combined with the bell-crank levers at the top ends, is sufficient

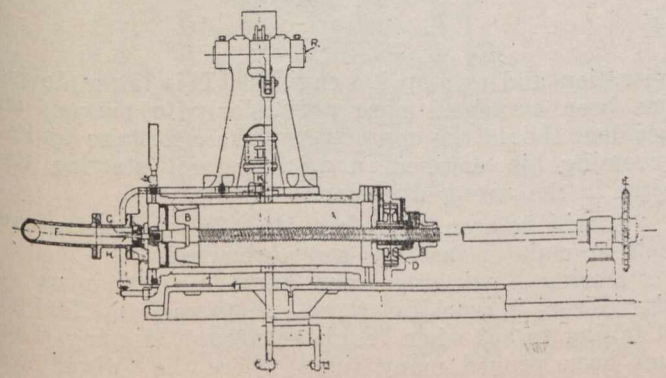
to operate a lever which turns a toothed wheel by means of a catch; this wheel being keyed on to the main tension screw. The amount of movement of the posts or straps required, or in other words, the amount of travel of the Steam Brake Piston in order to tighten the brakes, is not much, but as the wear on the blocks



END ELEVATION
(to a larger scale than those on opposite page)
OF
WILDE & PETRIE'S PATENT OVERWINDING and OVERSPEED CONTROLLER



PLAN
OF
WILDE & PETRIE'S PATENT OVERWINDING and OVERSPEED CONTROLLER



SIDE ELEVATION
OF
WILDE & PETRIE'S PATENT OVERWINDING and OVERSPEED CONTROLLER

Plate 3

increases, this travel or movement increases until the catch lever has moved the toothed wheel another tooth round. The whole arrangement in no way causes extra wear on the brake blocks, as it will be readily seen that should it so happen that the brake blocks were particularly hard or unwearable, automatic adjustment would only take place very rarely.

"The whole arrangement of the overwinding and brake gear, combined with our Melling's Patent Steam Brake, is of the most modern design, and gives by its adoption, certainty and confidence to those who use them, and is one of the best and most efficient means that could be adopted for safety in modern winding, and has been proved absolutely reliable after 12 months of continuous working."

Wilde and Petrie's Patent Overwinding and Overspeed Controller for Winding Engines, made by Walker Bros. (Wigan), Ltd., Pagefield Iron Works, England.

"The object of this gear is to prevent a winding engine running at a dangerous speed and to arrest the engines should the cage pass the keys beyond a safe limit at the termination of the wind; also to prevent the engines being started again in the same direction should the man omit, by oversight, to reverse his levers.

"The gear consists of the twin cylinders AA, in which plungers BB are moved to and fro by square threaded screws in opposite directions to each other, and at a speed directly proportional to that of the cages.

"The screws are rotated by spur wheels D in the front cylinder covers, which receive their motion from a sprocket wheel E and chain or other suitable gearing connected with the crank shaft of the engine.

"The spur wheels are fitted with ball thrust bearings on either side to take up the end thrust of the pistons. At the back end of each cylinder is a non-return valve G, opening inwards with a small orifice in the centre, and on the piston end of each screw is fixed a taper needle valve, H, which at a fixed point in the wind enters the orifice.

"The needle valve is of such a diameter as to close entirely the latter as the piston approaches the end of its stroke.

"Leading from the bottom of the back end of each of the twin cylinders are pipes communicating with a plunger K, placed above the two cylinders, and connected by means of a trip gear L, with the throttle valve and brakes, which are actuated by the descent of the weight M, and the consequent movement of the bell crank P.

"These pipes, which each contain a non-return valve, J, the space between the backs of the pistons and the connecting pipe, F, are entirely filled with oil or other suitable fluid. At the start of the wind, the piston B, which is in a position next to the spur wheels, and not as shown on the diagram, begins to force oil through the orifice in valve G, and through the pipe F, into the other twin cylinder.

"As the velocity of the cages increases, so does that of the oil flowing through the valves G. Hence the pressure of the twin cylinders necessary to force the oil through the orifice varies with the speed of the cages.

"The method of working is as follows:

"At the fixed point in the wind precisely when the engine winder should shut off steam and apply the brakes, the needle H enters the orifice of the valve.

"Thus the effective area for the passage of the oil from one cylinder to the other is gradually decreased, and if the speed of the engines does not vary proportionately, the pressure of the oil rises, lifts the plunger, and so closes the throttle and applies the brakes.

"In the event of starting in the wrong direction, since the needle valve completely blocks the orifice in

the valve G, the slightest movement of the piston at once raises the oil pressure and actuates the mechanism.

"The connections of the trip gear to the throttle valve are such that the engine winder may regain control of the latter by simply drawing his handling lever back to the closed position, but the steam brake cannot be released until the trip mechanism is reset.

"The main advantages of this gear are as follows:

"Positive action being independent of a centrifugal governor and hence ready response to any change of speed.

"Simplicity of design with the pin joints and idle parts reduced to a minimum.

"Easy adjustment to suit varying conditions.

"Simple application to any existing engine. (Plate III.)"

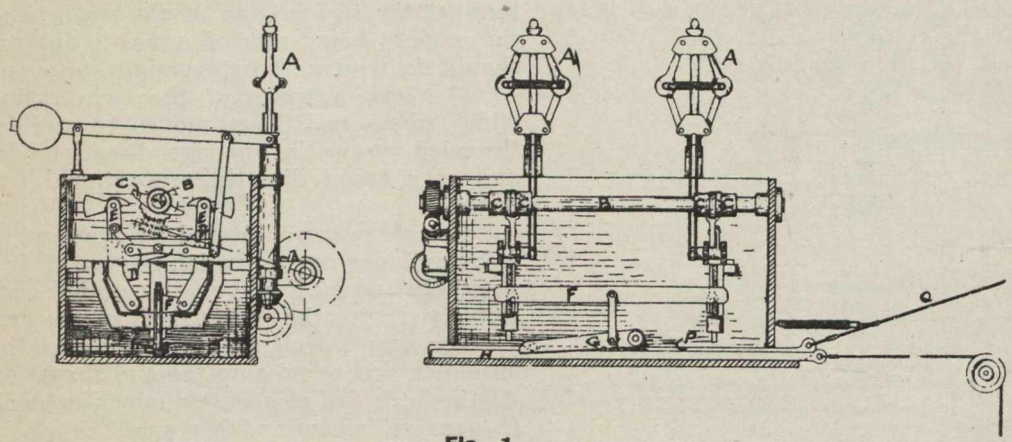


Fig. 1.

THE "VISOR."
(BERTRAM'S PATENT.)

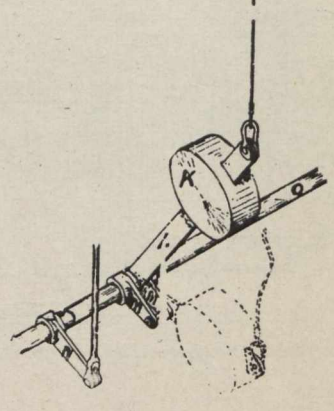


Plate 4

Bertram's Patent Visor for Prevention of Overwinding and Starting Engines in the wrong direction, made by John Wood and Sons, Ltd., Barley Brook Foundry, Wigan, England.

"The approximate price of the 'Visor,' packed for shipment and delivered f.o.b. Liverpool, is about £120, and the approximate weight when packed is from 16 to 20 cwts.

"We have supplied and installed up to date about 150 machines in various parts of the country, also South Africa, and have supplied the same to other engineers on this side for shipment along with engines of their own particular build.

"We may also add that the 'Visor' has been laid before the Home Office. It complies with the proposed new Mines Regulation Act now before the House of Commons, and is also referred to in the Blue Book, pages 10, 11, and 12 of our Royal Commission on Coal Mines, etc.

"As is well known, the 'Visor' not only prevents overwinding at the end of a run, but also at the beginning if the engineman starts the engines in the wrong direction.

"By the arrangement of two governors at different speeds, the operation is as follows: No. 1 governor is set so that if the engineman does not reduce the speed of the engines, say, at four or five revolutions from the point of landing, the cams on the revolving shaft come into operation, and so shut off steam and apply the brake. If speed has been reduced on No. 1 governor allowed the cams to pass the Nebs, and the engineman does not continue to reduce the speed, No. 2 governor will come into operation at a point, say 1½ or 2 revolutions from landing. The speed of the engines now being so reduced that it is almost impossible for an overwind, but should the engines still keep revolving, an arrangement fixed in the headgear in the path of the cages would again bring the 'Visor' into operation and to stop his engines. This latter device has been arranged more particularly to prevent an accident should the engineman make a mistake by not reversing his engines, and, therefore, starting the same in the wrong direction.

"It will be seen, therefore, that the engineman can neither make a fast nor slow overwind.

"During a winding every piece of mechanism of the 'Visor' is working, therefore, there is no fear of it failing to act when required through sticking. This has been proved many times where the 'Visor' has not come into action for months and then acted when it was found the engineman had failed to do his duty.

"The 'Visor' is applicable to any class of winding engines, whether new or at present working, without necessitating a new brake, providing the present brake is efficient.

"Each 'Visor' is sent out with worm wheel and gear for driving from engine shaft, and all attachments to pit head frame, starting valve and brakes. Where it is

impossible for one of our engineers to see the engines, the following particulars are required to enable us to send the 'Visor' ready for fixing:

"1. Number of revolutions of drum per wind.

"2. Maximum speed of engines during wind.

"3. Number of revolutions from end of wind, when steam is shut off.

"4. Sketch showing methods of working starting valve.

"5. Sketch showing methods of working steam brake.

"6. If there is no steam brake, sketch showing type of foot brake, and how worked.

quired positions. As the speed of the engines gets up, first one and then the other governor flies out quickly, and throws (through the medium of levers D), the vertical arms E with hooks attached inwards, bringing the said hooks in line of contact with beaked cams C. When nearing the end of the wind, if the engines are brought to rest in the usual manenr, the governors fall, and bring back the hooks out of the line of contact.

"If, however, through any cause whatever, steam is not shut off at the usual point, or the engines not being slowed down, the hooks make contact with the beaked cams C, and thus lift up the sliding frame and

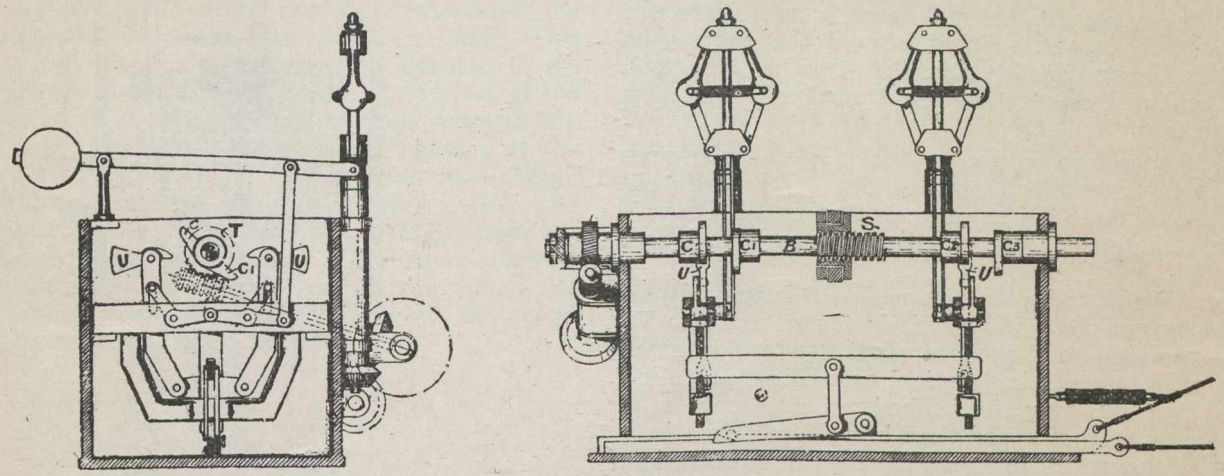


Fig. 2.

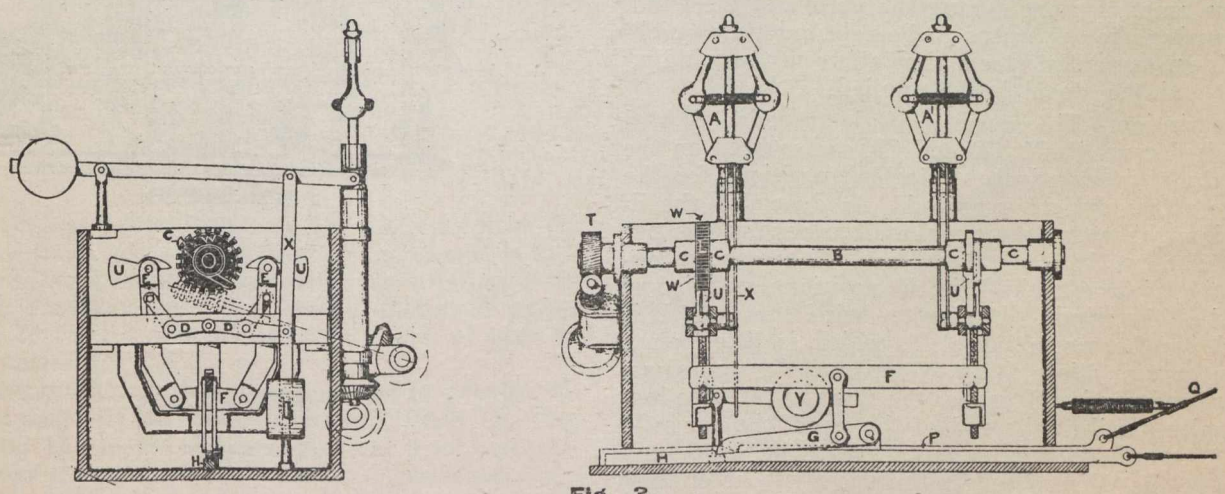


Fig. 3.

Plate 5

"7. Sketch showing room available on crank or drag crank shaft for fixing 'Visor' driving wheels.

"The illustration (Plate IV., Fig. 1) has been specially prepared to show how the 'Visor' does its work, and it must be understood that the positions are not drawn with absolute accuracy.

"The governors (A) which act only as speed indicators are driven by suitable gearing from the crank or drag crank shaft of the winding engines, as also is the worm wheel shaft B; the latter shaft makes approximately one revolution per winding, and carries the beaked cams C which are adjusted to the exact re-

bar F; this is connected to the pawl G, which being lifted out of the notch in the bar H, releases the same, and as this holds the weight K in suspension, these immediately fall, and respectively close the starting valve, and apply the brakes.

"The arrangement of levers for closing the valve, or applying the brake is the one most commonly used, but it will be easily understood that local arrangements necessarily entail special designs to suit.

"The one shown acts as follows: O is the actuating shaft for the starting valve or steam brake (as the case may be), and is worked by the engine through

the lever N, which is keyed on. On this shaft are also keyed, double levers M, with the loose lever L, between the same. On the lever L is the weight K, which is held in suspension by a cord attached to the draw bar H of the 'Visor.' When the engineman is working this shaft, the lever L is stationary, and the levers M work up and down underneath it. When the weight is released by the 'Visor' it falls and forces the lever L on the levers M, which, being keyed on turn the shaft and close the starting valve, or apply the brake. Of course, two of these arrangements are necessary, i.e., one for the starting valve, and one for the brakes.

"It will also be noticed that in the 'Visor' there is a second draw bar P, which is connected by the wire cord Q to catches in the pit head frame. These are fixed over the cages, so that, should the engines be started in the wrong direction, the draw bar P is pulled out, and will, as seen, release draw bar H, and stop the engines.

"It will therefore be seen that so long as the engines are properly controlled, nothing out of the ordinary occurs, but should the engineman neglect his duty in any way whatever, then the 'Visor' steps in and does his work."

Messrs. Wood and Sons also make an improved patented arrangement for long winds shown in Plate V., Fig. 2, applying to the worm shaft, "which is given a longitudinal traversing motion, as well as a rotating motion, thus allowing the beaked cams to move at a considerably greater speed than heretofore. In a long wind with the worm shaft making only one revolution, and merely rotating, the travel of the beaked cam is very slow, and in the event of the apparatus coming into gear, apt to allow the engines to run too far, owing to the slow release. But with the longitudinal traversing motion, the cams can be made to revolve two or three times or more during the period of the wind, thus causing the apparatus to be released very quickly, and, consequently, steam shut off from the winding engine, and the steam brake applied.

"Description.—The worm shaft is threaded S, and the beaked cams C, C1, C2 and C3, are secured on the worm shaft in relatively suitable positions for the number of revolutions required. As drawn in the illustration, the worm shaft makes four revolutions per wind. The two beaked cams C and C1 are shown opposite the trips or hooks U in the positions occupied at the end of the winds. During the wind the shaft B is rotated by the worm wheel T, which is fitted on a feather key, to allow shaft to traverse through same. The screwed portion S, causes the shaft to traverse longitudinally, until at the end of the wind, the cams C1 and C3, come into line of contact with hooks U, and disengage the 'Visor,' unless the speed of the engines is suitably retarded in the usual manner."

Another improvement to prevent excessive speed of the winding engines is shown in Plate V., Fig. 3, which not only prevents overwinding and starting in the wrong direction, but also prevents the engine being run above a predetermined speed. To illustrate: A pair of winding engines when doing what is considered their full duty, attain a maximum speed of say, 60 revolutions per minute, or one revolution per second. It may, owing to peculiar local circumstances, be considered unsafe to run much above the speed, even when winding coal. Granted that this is so, then it is manifestly unsafe to attain a higher speed when lowering men down the pit, as, at this time, the heaviest weight is in the descending cage, the tendency is for the engines to race. In such a case, we should recommend the Improved 'Visor' which, when the speed attained to, say, 65 to 70 revolutions per minute, would automatically come into action and stop the engines in its usual manner.

"Detailed description.—In connection with the slowest of the two governors A, there is arranged a multiple cam W, which is also secured to the worm shaft B. During a winding operation, when the engines are running at their normal speed, the hooks U, are, as previously described with the original 'Visor' thrown into the path of contact of the beaked cams C, but not sufficiently far as to engage in the notches of the multiple cam W. If, however, the speed be sensibly in-

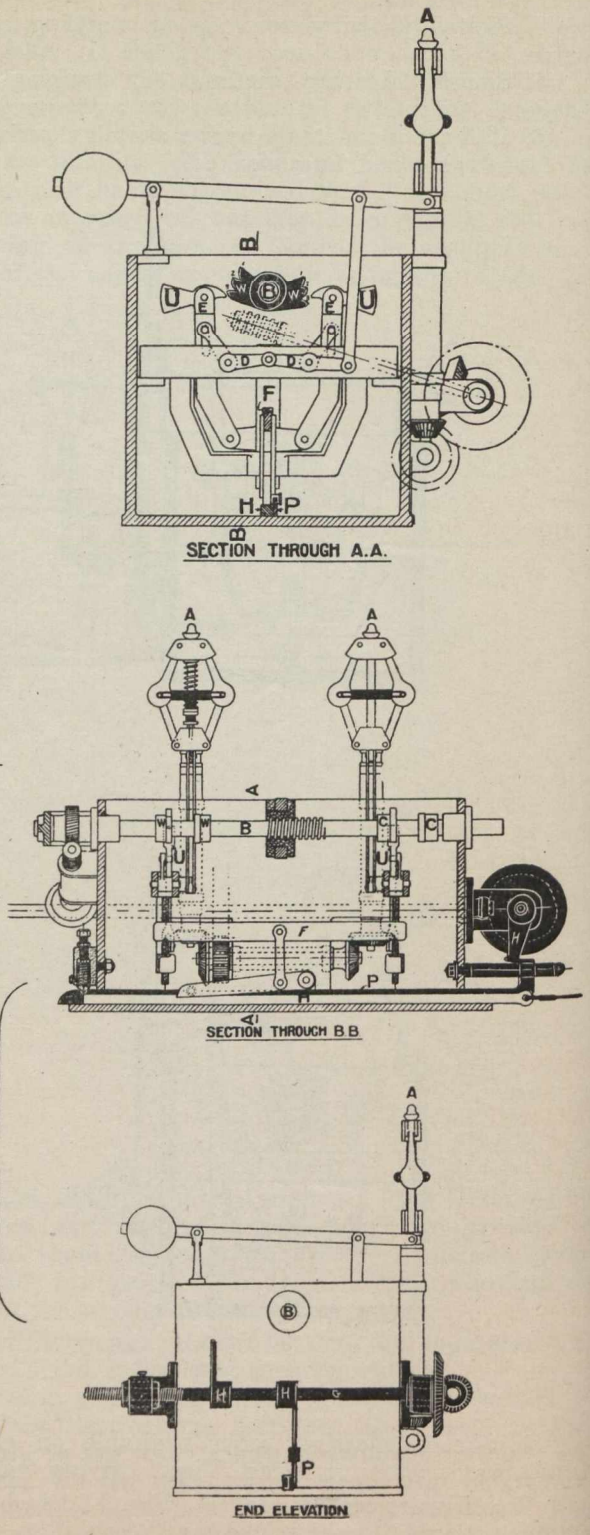


Fig. 5

Fig. 4

Plate 6

creased, say by five to ten revolutions per minute, then the governor A, by expanding still further, lifts the weight Y by the link X, and thus throws the hooks U into contact with the multiple cam W. This, of course, immediately releases the draw bar H, and the engines are brought to a standstill.

"It will be noted that this improved arrangement is in gear from the beginning to the end of the wind, so that at no point in the wind is it possible to exceed the minimum speed determined upon."

An improved device to prevent starting in the wrong direction is shown in Plate VI., Fig. 4. "A small shaft G at the end of the 'Visor' box is driven by bevel gearing from the drum shaft, and the ration of the gearing is such that the shaft G has approximately the same number of revolutions as the drum shaft. This shaft C is also given a cross traverse. Secured to the shaft C are two long cams H, which at the end of the wind (owing to the traversing motion) respectively come to rest just before the point of contact of the draw bar P. From this, it can be seen that should the cage after reaching banking out level, still continue to ascend, the cam H will immediately draw the bar P, and operate the 'Visor.' The same happens after banking out, should the engineman start the engines in the wrong direction. To show the quick-

Plate 7

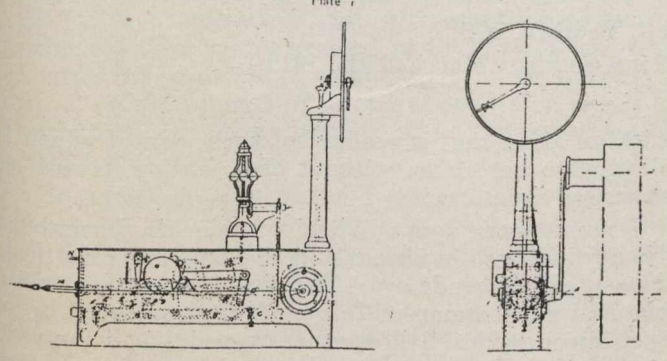


Fig 1

The "Simplex" Patent Overwinder

Plate 7

ness of the operation, it is only necessary to draw the bar P one-third inch. The radius of the cam H is four inches, and to illustrate—supposing the winding drum is 16 feet diameter, the radius is eight feet or 96 inches 96-4=24 to 1 ratio, ⅛in. of 24=3 in. travel of cage, to operate the 'Visor.'

Yet another improvement is a device to prevent increase of speed at the end of the wind, Plate VI., Fig. 5. "After the speed of the engines at 4 to 5 revolutions from the end of the wind has decreased sufficiently for the cam to pass the hook in connection with the slow governor, there is arranged in connection with the fast governor A1, a three beaked cam W, secured to the worm shaft B. During the winding operations, when the engines are, say, from 1½ to 2 revolutions from the end of the wind, and the speed is not sufficiently decreased, the hook U comes in contact with the first of the beaks on cam W. This, of course, immediately releases the draw bar H, and the engines are brought to a standstill. If the speed be slow enough to allow of the cam W to pass the hook U, and the steam be again applied so that the speed of the engine be increased, then the second of the beaks on cam W will be brought into the path of contact of the hook U, and the 'Visor' will be brought into operation.

"Should the speed of the engines be decreasing sufficiently to allow the first two beaks of the cam W to pass the hook, but not sufficiently to come to rest at banking level, then the last of the beaks would put the 'Visor' into operation just before the cage reaches the top."

Simplex Patent Overwinder, made by Robert Daglish & Co., Ltd., St. Helens Foundry, Engine and Boiler Works, St. Helens, Lancashire.

This overwinder is described in part as follows in The Iron and Coal Trades Review of August 4th, 1911:

"There are many such forms of apparatus on the market, but the present trend of legislation cannot fail to lead to further developments in this direction. There are certain essentials in such apparatus which in many otherwise excellent devices have been overlooked. The most important is, perhaps, the advisability of the mechanism always being in gear, i.e., forming part and parcel of the winding unit; as with anything in the nature of a stand-by, only called upon in a case of emergency, it too frequently happens that, when such call is made, the apparatus has, from rust or other causes (incidental to the lying-by), become more or less inefficient, if not wholly useless. The other essentials are positiveness of action, simplicity and accessibility of the working parts, and last but not least, economy in initial cost. No maker of repute will sacrifice in the smallest degree efficiency for economical production, but at the same time the requirements of the smaller or less prosperous undertakings have to be considered.

"These are the paramount considerations which have led Messrs. R. Daglish & Company, Limited, St. Helens, Lancashire, to evolve what they appropriately call the 'Simplex' Patent Over-Winder. They claim that it is the simplest and the least complicated of any that have yet been introduced, although it covers all the necessary points which have to be dealt with in an overwinder. The apparatus will retard the engine when the speed is slightly in excess of normal, and when three or four revolutions from the top. Should the engine speed be greater in the last three or four revolutions when approaching completion of the wind, or should the engineman by accident put on steam between these points, part of the braking mechanism will suddenly close the regulator or throttle-valve, and apply the brake with a pressure corresponding to the speed of the engine.

"The apparatus may be worked by gearing chain drive, or direct from the crank of the engine. This last method is shown in our illustration Fig. 1, in conjunction with which the following description explains the construction and working of the apparatus. The mechanism is driven from the crank of the engine on the shaft A, which drives the screwed spindle D through bevel wheels B and C. On the screwed spindle are two guide nuts EE, which can be adjusted to meet the required depth of shaft or wind, while fixed on the nuts are rollers FF, which actuate the wipers HH. When the engine commences to wind the nuts travel along the screwed spindle, releasing the wipers, which move upwards, drawing down the racked lever J. At the same time, the governor will rise, pushing forward the vertical rod K. Should the speed of the cage be slightly in excess of the normal in the last three or four revolutions of the wind, the governor will still hold the vertical rod K forward, and the rollers running down the wiper will force up the lever J, and engage with the rod K, drawing forward the trip rod M through the lever L, which will suddenly close the

regulator and apply the brake with a pressure corresponding to the speed of the engine.

"When the trip or braking rod is once drawn back to apply the brake, whatever may be the position of the governor, there is no release; the rod being notched at the end is held back by the sliding handle N. Should the engine from any cause creep away, or insufficient braking power be applied, and the cage reach a certain point above its normal position, one of the nuts EE will strike against one of the collars OO, fixed at opposite ends of the sliding bar G, which operates a double-movement bell-crank P, drawing back the catch lever T through the double-ended rod S, and thus quickly releasing the weight Q, which, being connected to the braking rod M, through the lever E, and the floating rod R, will close the regulator and apply full braking power to the engine simultaneously. Should the engineman start his engine in the wrong direction, the weight will be instantly released, performing the same operation as above.

"When the engine has made a partial overwind and the cage has come to rest before reaching the surface in the last three or four revolutions, the brake is thus only partially applied according to the speed of the governor, doing away with any heavy jerking at the cage and lessening the great strain put on the ropes by the sudden application of the full brake power. To release the brake, a small handle N is raised, when the brake is released, the throttle valve being free to engage in its former position. When the engine has made an over-wind, or the engineman started it in the wrong direction, the weight which has applied the full braking power will be lifted and the engine brought back to its normal running position.

"The indicator is of the column type worked with worm and wheel from the shaft A. It is fitted with a gong and large dial, and the pointer travels seven-eights of a revolution for each wind. The 'Pickering' governor is worked from the screwed spindle by means of sprocket wheels and a roller chain."

AN APPEAL FOR CO-OPERATION.

By Walter Henry Prest, Bedford, N.S.

(Read before the Mining Society of Nova Scotia, March 27th, 1912.)

For several years the annual gold yield of Nova Scotia has been decreasing, with the probable future prospect of a still further decrease. There is no doubt that our gold resources are still valuable and the frequent discovery of rich float shows that bonanzas still exist, and yet a general loss of confidence, both in ourselves and our resources, is undeniable. What is the cause? Are we up-to-date? Do we keep abreast of other lines of business in working and business methods? Are we co-operating? I am afraid not.

For two generations the gold miners of Nova Scotia have struggled, each one for himself, as well as we knew or could, without organization, without sufficient funds, and without that patriotic feeling for the industry we represent, which, once expressed in energy would place gold mining in Nova Scotia on a respected footing. So through the decades we have struggled and waited, each gazing at the future from his own narrow point of view—the one his father left him. Through our own individual opera-glasses, so to speak, we have watched for the coming of our own individual capitalist. And while we watch, our provincial gold yield is dropping year by year and we are unable to stop it.

Prophetic geniuses, yet living, predicted prosperity from time to time, when each to-morrow would be a boom-day. Editors, politicians, and mining men joined in the happy chorus, yet did nothing. The most extravagant statements were made and believed. Promoters were loaded up with oratory and aimed at the long-expected capitalists from the United States. English capitalists were becoming interested. Low-grade ores would become the salvation of the gold mining industry in Nova Scotia. Our country would yet be a leader among the world's gold producers, and so on ad nauseum. In view of our decreasing gold yield, can we claim the fulfilment of even a fraction of these predictions? No doubt each individual owner has done his best. But it is like the proposed invasion of an enemy's country with an army that is ready, but each man of which is allowed to act alone, without organization, means, or expert advice.

Several years ago a friend of mine in Lunenburg County indulged in visions of a 60-stamp mill on a large deposit of low-grade ore. The vision of another friend pictured a 100-stamp mill on an immense deposit of an even lower grade. Still another capped the climax with an island full of an exceedingly low-grade ore, for which he only wanted a 100-stamp mill to start with. Each, as he imagined, was the worm in the apple for whose special benefit that apple seemed to have been made. Another, whose radiant face spoke a wealth of hopes, had a property with float rich enough to interest a Rockefeller. And I, your now thoroughly humbled servant, also had something rich enough to keep him poor ever since developing it! And each of these refused co-operation for the soundest of reasons, that as he could easily become rich from the yield of his own mine alone, it would be folly to waste time on properties of doubtful or unknown value. Other temporary combinations of high hopes and low-grade ores have been witnessed at Salmon River, Gay's River, Memramcook, and elsewhere. As far as I know, few of these experimenters in individualism have become rich, although nearly all are still holding their old areas, and still wearily looking for the capitalist that has never come.

Among the principal causes of our dwindling gold yield, are: (1) Not want of capital, but want of confidence. This is evident when we read that over $1,000,000 of Nova Scotian money is invested in Mexico. (2) Want of knowledge and skill in the workmen. (3) Want of funds by the actual owners. (4) Want of co-operation between the capitalist and the prospector. We have examples all over Nova Scotia of half-finished work, badly done work, badly located, scattered, and spasmodic work, and time wasted in waiting for and

searching for funds. As usual, those willing to work had little money, while those with money had little confidence in gold mining; so prospecting was often stopped on the verge of success and the money expended sacrificed.

Time after time false hopes have been raised by the incorporation of a professedly genuine development company. But the leading spirits therein were spirits indeed, for the companies they gave birth to soon disappeared from view. These spectral concerns usually embodied two principles,—viz., financial control from the inside and financial support from the outside, both destructive to a fair degree of co-operation.

We have co-operative creameries in Canada and co-operative commercial and manufacturing enterprises elsewhere, therefore, why not have co-operative gold mines? Perhaps it is needless to say that combination has replaced competition as a ruling principle in business, and a sub-principle of combination is that you help some one else, so that he can help you. Competition, however, still survives among the small men in their efforts to serve the big ones. The point is to awake to the fact that in union there is strength. Facts are convincing in themselves. The all important point is to inject the incentive that spurs men to action in new lines, to inspirit each one of us with the idea that his country will become great only as he becomes great, to fill us, each and every one, with ambition to grasp a principle that before seemed to be beyond our reach, I mean the principle of co-operation. I do not need to dwell on the benefits of co-operation, which is self evident to all who have struggled alone and unsuccessfully with a big problem.

In advising co-operation I am aware of the difficulties to be met with in getting men of varied opinions to work together. But greater difficulties have been met and conquered before, and could certainly be overcome now by those whose resources and confidence are equal to meet competition in the present struggle for existence. The chief of these difficulties will doubtless be the appraisement of undeveloped properties for the purpose of capitalization. There are those who usually drive hard bargains with the man who is down. There are those who may demand advantageous terms because they are in a position to do so. There is the man who not being a miner has an exaggerated idea of the prospective value of his property. There are others who insist on bonding. There are also men who have spent their last dollar in the work and who can help but little. Then there are some over-shrewd men who see in every proposition advanced, some scheme to injure them, but we trust these last are few. To offset these difficulties we must appoint as appraisers men of known probity and knowledge of the business in hand, and governed to some extent by rules agreed to beforehand. I have no doubt that the majority of owners will approve of any fair methods and rules for valuation and the rest will join after some progress has been made.

The appraisement of property for purposes of capitalization is in this scheme a very important question, and a difficult one, because in undeveloped or partly developed properties the values are chiefly hidden by surface soil, and no just comparison between them and running mines would ever be made by the ordinary mining engineer. They are, therefore, in a class by themselves. Mere extent of territory counts for little where the principal criteria of value in selection are the quantity and the importance of rich float.

There are the following points to be considered in such an appraisement:

First.—Quantity of gold-bearing boulders. An approximate plan should be prepared and on it jotted down the position, size, and character of each piece of gold-bearing quartz known to have been found there. The extent of ground containing fine gold obtained by panning, should also be noted down. Thus we get the quantity and limits of gold distribution, two important points in the consideration of an estimate of value.

Second.—Then comes a more difficult point—maximum value and quantity of rich float per ton, as estimated from loose quartz. This is nearly always exaggerated, often unintentionally so, and should be accepted conditionally or compromised.

Third.—The proportion, position, and limits of richest float should be carefully entered on a plan. This is a very important point, as under ordinary conditions of drift deposition, it indicates the extent of the paystreak proper, as distinguished from the poorer ore into which it usually passes. Two or three rich boulders close together usually indicates in undisturbed drift a narrow paystreak. Many widely distributed rich boulders indicate a very large paystreak. And yet we must be on our guard against the scattering influences of post-glacial modification. However, in the eastern districts the usually regular distribution of drift, makes this precaution of less account. The quantity of rich float found also depends largely on the amount of search that has been made for it. And as the location of the richest float is nearly always where many pits and trenches have been dug, therefore to allow value in proportion to the number of rich boulders found would in some cases depreciate unfairly the value of a comparatively unprospected property. I am paying particular attention, as you see, to the showing of rich boulders, because in order to insure a prize worth searching for, we should consider only the properties showing exceptionally good indications, avoiding all of doubtful value.

Fourth—Another point of value is the presence of known gold-bearing leads on the areas showing rich float. Unless they are known to contain pay-ore or are supposed to be the source of rich float, they would not add much to the prospective value of the property.

Fifth—Location on a pay-zone or fold in a district of undoubted value should be considered of some importance. Nearly all of us, however, are apt to build too high hopes on this aspect of the question. "On the same range," has always been a ready phrase luring many to financial ruin. With due respect to holders of opposite opinions, I would almost as soon be off the district as off the paystreak, let the range be where it may. Still like the previous point it should be considered in a question of prospective value.

Sixth.—The above five points deal with indications of value, but the following, pertaining to the costs of prospecting and mining, will either raise or lower the estimate of value already arrived at as the conditions to be considered are favourable or unfavourable. These points being distinctly different from the former, should not be touched on until an estimate of value from float ore, locations, etc., has already been decided on. This point, the depth and extent of the surface to be worked in, brings in the number and depth of the pits needed in prospecting. This has usually been considered the greatest bar to success in prospecting, often depreciating very much the prospective value of the property worked on. It is, however, not as serious an obstacle as much water. However, it greatly increases the cost of prospecting when done in the systemless

way so general throughout Nova Scotia. While deep surface is certainly a great drawback, it need not depreciate values much unless accompanied by a strong flow of water. As I showed in my recent paper on prospecting, much money could be saved by following up a carefully arranged programme planned on systematic lines, and only after a close examination of the ground to be worked over.

Seventh.—Another important point bearing on mining, even more strongly than on prospecting, is the quantity of water to be handled. Fortunate indeed is the Nova Scotian mine that is so dry that a pumping outfit is only a minor consideration. Prospectors who use a barrel for bailing are often subject to loss of time and frequent "drowning out" during heavy rains. An additional cost, especially in modified drift with its quicksands, water-worn gravels and other porous material, is the cribbing necessary to prevent caving. This, of course, lowers somewhat the prospective value of the property. The possibility of drainage means much both to prospector and miner of ore.

Eighth.—The presence of available water-power affects to a great extent the value of the property as a running mine; the difference in cost between steam and water-power often meaning "a mine" or "no mine." Therefore, the possession of water-power means an added value as compared to ordinary cases in which steam is used.

Ninth.—As steam is the power commonly used, I would propose making it the standard by which to compute the economy of water-power. But as the price of fuel, and some times labour, varies with locality, I would suggest making allowances for these differences in the cost of the production of steam.

Tenth.—An item bearing to a moderate extent on the cost of supplies, and also on the facilities for quick business, is the distance to the nearest post-office, frequency of mails, and distance to the nearest railway station or seaport. This would only apply seriously to a few of our mines, and in such places would have a bearing on the value of the property.

Eleventh.—The building of roads from mine or mill to government roads would affect costs during the earlier operations, as it is often impossible to get government advances for roads during the doubtful stages of mine work in isolated districts.

While this is only an approximate method of appraisement, it is about the best that can be made under the conditions. Conscientiously carried out, any deficiencies in this method of valuation would affect all undeveloped properties alike. The resulting values, considered as the purchase price, may be paid for in co-operative stock. Of course, in order to give to each contributor of property a fair return, the company should not be capitalized for more than the actual needs that the work in view calls for.

In order to ensure the reliability of workers, a preference should be shown to shareholders in the matter of employment. All employees should be urged to identify themselves with the company by the possession of a few shares of stock, thus ensuring to some extent their friendly co-operation.

To be sure that a foreman is fit for his position, I would have every man applying for such a job, pass an examination in the various duties pertaining to the work, and especially in the nature of drift transportation, and his ability to keep a record of work and plans that would be recognizable.

What is badly needed for the use of these men is a condensed handbook on glacial geology, shorn of all technical terms and worded in the phraseology of the mucker. Better a little slang, if easier understood, than an ignorant workman. Are none of our gold-mining friends in a position to supply the want? For its use is indispensable in the proper training of a prospector.

In selecting the first property for exploration several considerations should be looked into: Apparent value of float ore, depth of surface, and quantity of water. These seem to me to be the chief points. In my own work the extremes of cost in about 400 pits and trenches (of the most of which I have detailed plans) were from half a cent to seven cents per cubic foot, the latter cost nearly always caused by a large quantity of water. With data like this at our command we could estimate pretty fairly the probable cost of prospecting.

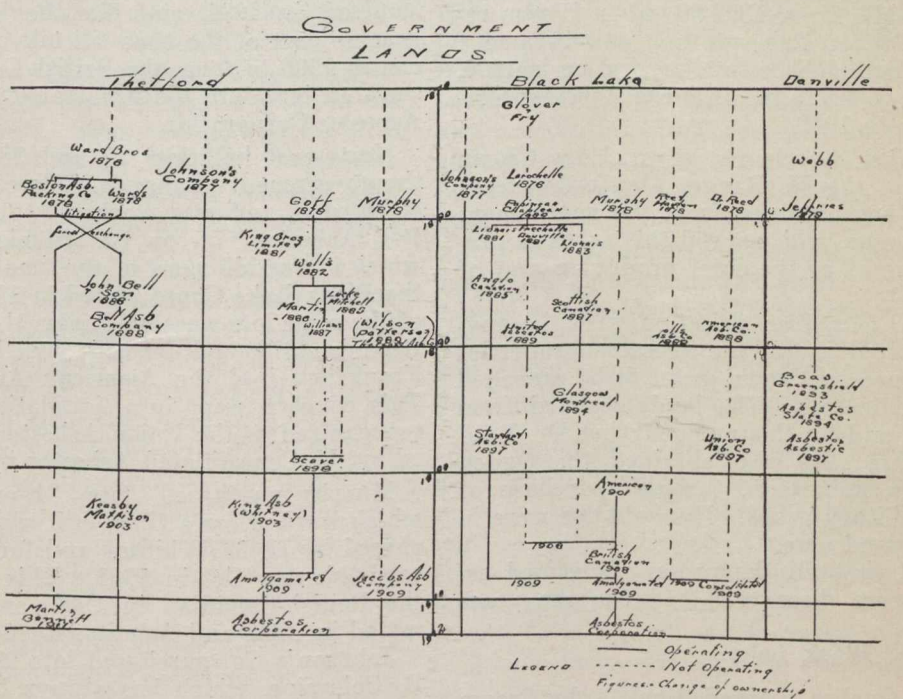
In conclusion I would like to refer once more to co-operation as applied to gold mining. Nearly all branches of business are organized, some socially, some commercially, some politically. Commercially, we, the gold miners of Nova Scotia, stand alone, each on his own precarious foothold. We are buffeted by circumstances and tripped up by each other, but of course legally and honorably according to the rules of the game. We cling to individualism as fondly and reverently as we cling to the two useless buttons on the sleeves of our coats.

Of course we all believe in co-operation, and if we object to it our chief reason is because it is so hard to convince the other man. But let the other man go. Time will convince him. It is chiefly competition that causes ninety per cent. of business failures in the lifetime of the average man. "Competition is the life of trade," said the lawyer, as he rushed his ruined clients through the insolvency court. But we gold miners need compete with no one, so we can afford to ignore principls moss—grown with age and dank with the injustice of centuries, principles whose dying mutterings tell of ruined homes and broken hearts. Therefore, let us co-operate. Let us make an effort to arrest a dwindling industry, ensure future profits without the usual risks, and finally to show a provincial gold yield that we will not be ashamed of as at present. Do not wait for precedents or opinions long since relegated to a mouldy past. Let us show the world that we have confidence in ourselves and then it will have confidence in us. So let us awake and get to work and forget not that our progress means to a certain extent the progress of the land we live in. And finally, may I dare to express the opinion that the greatest patriot of all is the man who elevates himself and his country by labour rather than by shedding the blood of some foreign patriot.

ASBESTOS HISTORY.

BY W. J. WOOLSEY, M.E.

The asbestos industry has grown to considerable proportions and the public generally are seriously interested in that growth. Various histories, more or less complete, have been written touching on the several phases, but we have had no reference library to instruct us in the development of the different mining properties, save a quiet retreat to one of the old pioneers. This led me to compose the chief features in the development for my private use. It seemed to me that a graphic presentation further assisted to clear up the uncertainty of dates and figures, and in the hopes that it may be interesting to a portion of the Journal's readers, I venture to submit for this their use. The properties given produce about 85% of the camp's output, and I have included in the chart only the chief producers to prevent confusion.



Thetford Mines.

In the years 1875 Fecteau first observed asbestos, while roaming through the forest where Thetford Mines now stands, on a hunting excursion. Mr. R. Ward, of Ward Brothers, also discovered some outcroppings of asbestos while hunting for a mill-site on the Thetford River during the same year. The Q. C. Railway survey party passing over the present site of Thetford during the summer of 1876 saw several outcrops, which several events created interest, but led to no growth in the industry.

The Boston Packing Company, two of its directors being Col. Hutchins and Mr. Hayden, had noted recent discoveries which had been made in Pennsylvania, and thought it likely that other and more valuable discoveries might be made, advertised as early as 1874 in Boston papers.

In 1876 M. Nolan visited the vicinity of Thetford Mines to attend a wedding and carried back with him a sample of the curious material, which he afterwards showed to Mr. Hatch of Montreal.

Ward brothers, Alfred and Robert, sons of Church of England clergyman at Lower Ireland, purchased from the government in 1876 the first asbestos property, securing same through Crown grant, entailing cost of 40 cents per acre and settling duties for four years. Their purchase covered lot 27 in the V range of Thetford.

In 1877 A. S. Johnson, of Inverness, purchased lot 27 in the VI. range of Thetford, and also 29, 30, and 31 in Range B., Coleraine, on conditions mentioned above.

In the summer of 1877 Mr. Johnston shipped about 200 lbs. sample to Philadelphia with a view to testing the value of the discovery and of working up a possible trade. The goods were favourably received and a shipment was made in May, 1878, by Ward Bros., and followed by a shipment from Johnson's property in September of the same year.

Ward Bros. now bonded their property to Mr. Hatch, of Montreal, for $6,000, $25 down, but the option was dropped. Again in 1878 Mr. Goff approached Mr. Thomas with a view to getting the Boston Asbestos Packing Co. interested in the Ward property. Mr. Thomas "went by" Mr. Goff and secured for the B. A. P. Co. the south-west half of Ward's for $6,000. The B. A. P. Co. worked their half for a time, but noting that their half was not as good as the north-east half, took legal proceedings to gain possession of the better half, and succeeded in forcing Ward Bros. to make the exchange. Ward Bros. worked along for another seven years when they got into a lawsuit with the Q. C. Railway over blockading their tracks, and, losing the suit, the property was so much entailed that they gave it up after which it lay idle from then till 1911 when it was again re-opened by the Martin-Bennett Asbestos Co., at a purchase price of $710,000.

The Boston Asbestos Packing Co. worked the other half of this property till 1886, when it was sold to John Bell & Son, asbestos manufacturers of London, England, which company was re-organized to take over the asbestos mining end of their business under the name of the Bell Asbestos Co., in 1888, which company re-

tained ownership till 1903, when it was taken over by the manufacturing company of Keasby & Mattison, of Ambler, Pa., the mines working under the name of the Bell Asbestos Mines Co.

In 1878 Mr. Murphy secured from the Crown the reduced lot 28 in VI. Range, which he worked till 1892, and then let lie idle till it was taken over by Wilson Patterson, of Montreal, and formed under the title of Thetford Asbestos Co. in 1889. This company did not do much and the property again remained idle till 1909, when it was purchased through Walter Raleigh Kerr for the Jacobs' Asbestos Co. In the same year, 1878, Mr. Goff purchased from the government lots 31 and 32, Range C., Coleraine, which he exchanged with Mr. Wells for some property in the United States. Wells sold his property and half was secured by Messrs Lucke and Mitchell, Sherbrooke, and a quarter each by Mr. R. H. Martin & Co., and J. J. Williams, in 1886. This property lay idle from 1892-96, when it was reorganized as the Beaver Asbestos Co., and became a part of the Amalgamated Asbestos Corporation in 1909, which concern was re-organized into the Asbestos Corporation of Canada in 1912.

King Bros., lumber merchants, secured by Crown grant everything in the V. Range, Thetford, except Wards'. In 1881 they obtained from the government lot 26 in the VI. Range, and worked this asbestos property till it was formed as the chief producing unit of the Amalgamated.

In 1878 Dr. Reed raised an agitation with the goverment which resulted in all the asbestos properties which had been issued by Crown grant to be cancelled and offered by public sale. The lands realized from $1 to $10 per acre, and by this manoeuvring Dr. Reed secured his holdings. He also obtained the Ogden block, located near Robertson, through purchase of what had been a military grant. His holdings were in all about four thousand acres.

It will be noted that all the present Thetford asbestos properties were discovered between the years 1876 and 1882.

Black Lake.

Glover & Fry, of Quebec, secured Block A. by Crown grant from the government previous to 1870. There was some dispute about the lines and an engineer, Poudrier, was engaged to re-survey the property which resulted in dividing same into Block A and Block B. Block A was secured by Larochelle in 1876, Larochelle being at the time a contractor on the Kenebec Railway, which operated from Levis to St. Joseph in Beauce. Larochelle borrowed money from a local bank and the property thereby came into the hands of Papaineau and Chapleau in 1880. In 1881 they sold a portion to Chas. Lionais, which was formed into the Anglo-Canadian in 1885. Frechette & Douville also purchased a part in 1881, which they worked till 1889 and then sold to the United Asbestos Co. in 1889. Lionais bought another part in 1883, which was purchased by the Scottish-Canadian in 1887. The Anglo-Canadian was reformed into the Standard Asbestos Co. in 1897 and made part of the Amalgamated in 1909, and the Asbestos Corporation in 1912. The United Asbestos Co. was purchased by Mr. H. M. Whitney, of the American Asbestos Co., in 1906, after lying idle a good deal for several years, and combined with the British-Canadian in 1908, became the beginning of the Amalgamated in 1909, and also part of the Asbestos Coporation in 1912. The Scottish-Canadian was sold to the Glasgow & Montreal in 1894, and like the Limited was idle the greater part of the time till taken over by the American in 1906 to form the British-Canadian in 1908, and move en bloc into the Amalgamated and later into the Asbestos Corporation.

North-east half lots 27 and 28 were secured from the government (Range B. Coleraine) in 1878 by Reed & Hayden, and was worked little till secured by the Bell Asbestos Co., on its organization in 1888, after which it was idle most of the time till incorporated into the Black Lake Consolidated in 1909. South-west half of the same lots were held from the government by Dr. Reed in 1878, and formed by Louis Wertheim, of Frankfurt, into the American Asbestos Co., in 1888. This concern went into liquidation, and in 1897 was reorganized as the Union Asbestos Mines and purchased by the Consolidated Asbestos in 1909.

Murphy purchased lots 31 and 31 R. C. in 1878 which worked for a time, but was mostly idle till purchased by H. M. Whitney and formed into the American Asbestos Co. in 1901. This was reorganized as the British-Canadian in 1908, and into the Amalgamated in 1909, and Asbestos Corporation in 1912.

Johnson's Co. purchased lots 29, 30, and 31, Range B. Coleraine, which has always been under the same ownership.

Danville.

Mr. Webb owned as farming lands lots 8 and 9 Range III. Shipton, which were purchased by Mr. Jeffrey in 1879, sold to Boas & Greenshield in 1893, and formed into Slate and Asbestos Co., and in 1897 incorporated into the Asbestos & Asbestic Co.

MINING DEVELOPMENTS IN WESTERN AUSTRALIA.

(Exclusive Correspondence of Canadian Mining Journal.)

London, October 3rd, 1912.

Western Australia, although still having only a trifling population for its enormous area, is developing rapidly. In 1890 the population was only just over 46,000; last year it had advanced to almost 300,000. In the same period the government revenue increased from $2,070,000 to $19,250,000. The external trade increased in the same period from $7,731,300 to $83,140,635. The great boosting factor has, of course, been the mining industry, and principally gold mining. Altogether over $515,000,000 worth of gold has been produced by Western Australia and the production goes on.

In the last five years of last century the effects, first of the Coolgardie and secondly of the Kalgoorlie discoveries, sent the gold mining industry rapidly ahead, and in those years the annual output rose by leaps and bounds from about 200,000 ounces to over a million ounces. This rapid rate of increase was maintained until 1903, when the gold output of the state reached the record of 2,064,801 ounces, of the value of $43,853,595. Since the zenith year of 1903 the gold output year by year has shown a gradual shrinkage, until for 1911 the figures were: Output, 1,370,868 ounces; value, $29,115,375.

The East Coolgardie Field, which practically means the Golden Mile, easily retained last year its place as the largest gold producer in the state. Out of the total output of 1,370,868 ounces, this field accounted for 809,547 ounces, or 59 per cent. of the whole, a higher percentage than it has ever yet shown. The East Coolgardie output, moreover, as compared with that of 1910, showed a shortage of 26,727 ounces, a percentage falling off of only 3.2 per cent. The total yield from fields other than East Coolgardie, last year was 561,321 ounces, and that was a decline from 1910 of 73,037 ounces. With one or two comparatively unimportant exceptions, every goldfield in Western Australia showed a less output for 1911 than for 1910. In most instances, however, the shortage was fairly insignificant; only in two or three cases was it serious.

An important development of the year has been the location by diamond drill in the Golden Horseshoe mine of a lode 15 feet wide, assaying 30 pennyweights to the ton (2,240 pounds). This drilling was done from the Great Boulder main shaft. Subsequently another drill hole was bored from the Great Boulder "Edwards" shaft, and located what is believed to be the same lode, but with a width of 27 feet, assaying 18 pennyweights per ton.

The Dundas field deserves notice as having been virtually the only one to show an increased output last year, 48,361 ounces, as compared with 43,261 ounces in 1910. The main producer on the Dundas field last year was the Mararoa, which turned out gold to the value of over $350,000, and paid $100,000 in dividends, besides accomplishing a great deal of useful development work. Other Dundas mines that have developed well and give good promise for the future are the Surprise and Viking No. 1. The latter has obtained some very rich returns.

The East Murchison field showed last year by far the largest shortage of output, having produced only 96,455 ounces, as compared with 138,748 ounces in 1910. This large deficit of 42,494 ounces, which accounts for nearly half the total falling off in the output of the state, was due mainly to the closing down of the Vivian and Gwalia Consolidated mines and to a big drop in the production of the Black Range and Oroya Black Range mines.

Although the Murchison field shows a slight falling off of output—123,365 ounces as against 130,983 ounces in 1910—there is no cause for disquiet about its prospects which are really very good. The big mine at Day Dawn, the Great Fingall, is developing satisfactorily at depth, while the Fenian, the Ingliston Consols, the Ingliston Extended and the Commodore give promise of becoming large producers.

A revival is probable on the North Coolgardie field, which produced 60,270 ounces last year, and did not fall far short of the previous year's output of 60,887 ounces. The chief mine of this field, the Menzies Consolidated, maintained its yield well during the year.

Looking at the gold mining industry as a whole it must be admitted that from the standpoint of statistics the result of last year's work was somewhat disappointing. As a set-off, however, the industry laboured under two disabilities, which, it is to be hoped, may prove to have been exceptional; the first was the shortage of labour, which hindered mining operations in the outback districts; and the second was the shortage of water, the result of two years' drought, which was severely felt in the outside districts. Given the removal of these two retarding influences—and in the natural course of events their removal is at least probable—the outlook is distinctly hopeful.

The copper mining is a factor of growing importance. The world's total production of copper last year was 869,370 tons (of 2,240 pounds), of which Australia generally contributed 44,660 tons, or just over 5 per cent. Copper (and lead) mines were discovered in Western Australia in 1842, but working was carried on in a most perfunctory manner in the early days. Rich lodes of copper have been located at Whim Creek, in the Pilbarra district of North-Western Australia, about 50 miles eastward of Roeburne, the copper ore being removed by quarrying. Promising lodes have also been struck elsewhere, such as at the Irwin mines and in the Kimberley district, which is intersected in places by copper and lead deposits in association with gold, and a rich lode has been located at Mount Barren, whilst various quartz reefs in the Wougan Hill contain copper in association with gold. Other fields are, of course, also producing this mineral. French and English capital are both engaged in developing Western Australian copper and much money is being spent on development work and equipment.

Tin is also mined in Western Australia, the bulk of it being derived from the Greenbushes field, where an interesting change in mining methods has occurred during the past four years, the alluvial miner having entirely given place to suction dredges. There are now stated to be about twelve plants in operation, varying in size from 12-inch nozzle pumps on floating dredges to 6-inch pumps driven by a small gas producer plant and portable steam engines.

In 1907 the Westralian output of tin was valued at $830,000, but in 1910 it had fallen to $230,000. Last year's production was worth about $275,000, so that the improvement that has taken place in the tin market since the heavy fall in 1907 has not been reflected by an equal increase in the output of the metal from Western Australia.

Regarding the Pilbarra tin fields, it is stated that Moolvella, which in 1907 was the largest producer of tin in the state, has practically died out entirely, and operations in connection with testing for dredgings plant on the Cooglegong Creek have been unsuccessful. Against this there has been a steady output from the Wodgina district, and it is reported that considerable lodes have been struck on one property in this district, with the result that some interest has been shown by people interested in tin in the Federated Malay States.

It is evident that the high price of tin no longer attracts the working prospector or miner, and that if the extensive field that exists in the West Pilbarra district is to be properly exploited it will have to be worked by capitalists and probably by means of dredging, provided sufficient water can be conserved.

GOLD MINING IN ONTARIO.

(Written for the Canadian Mining Journal.)

There lay in the vault of one of the city banks the other day, a couple of gold bars valued at $35,000, the product of the Hollinger mine. On the Rand or in one of the great gold mines of Australia or the Western States, the bars would have excited no more comment than a shipment of silver bars from Cobalt, yet on the floor of the bank vault in Toronto, to an enthusiast in Ontario gold mines, the bricks were a prophecy, an earnest of mighty things yet to be.

So far the business of gold mining in this Province has afforded more room for the exercise of hope than for the pleasures of realization. Not that there is no gold in Ontario. Indeed, there are probably few places of similar extent where it is more widely distributed. In the counties north of the east end of Lake Ontario; on the north shore of Lake Huron; on the eastern, northern and north-western banks of Lake Superior; on Rainy River; Seine River, and Lake of the Woods; on Larder Lake, Lake Wahnapitae, and Lake Abitibi; at Porcupine, Shining Tree, Swastika, and many other places, has the shining metal been found, sometimes as colors in the pan and sometimes as nuggets in the quartz.

Half a dozen times has it seemed that the gold mining industry had really arrived, and that at last the end of the rainbow had yielded up its prize.

Nearly fifty years ago the rufflers in the rush at Madoc had to be restrained by the mounted police of the day from invading the precincts of the Richardson chamber to prove whether or not its reputed riches were really there. No other pockets of a like kind were unearthed, but the prospectors of those and later days, showed that gold in the county of Hastings was not a myth, and it may well be that the quartz veins of Cordova and the auriferous mispickel ores of the region will yet make not the least considerable contribution to the gold output of the Province.

Lake of the Woods had its Sultana, its Mikado, its Regina, and its other deposits named after Oriental potentates. Once the Sultana seemed about to prove a bonanza, and indeed from first to last it yielded a good deal of gold. The Mikado, too, was not only rich at the grass roots, but carried values well down into the mine. Its productiveness led Colonel Engledue and his English associates, to undertake extensive and systematic operations in the hope of uncovering like bodies, but only the Elizabeth was found, and presently the Mikado vein ran into lean ground and activity was succeeded by silence.

The Golden Star, the Olive, Foley and their contemporaries, served in 1897 and 1898 to bring the Seine River into relief and Mine Centre into existence, but protogine bands, Hammond Reefs and Sawbills alike failed to produce in quantity, and once more there was quietness.

Sir Henry Clement Wilkinson, British general and Christian soldier, looked for "ounce rock" in the Regina, but found instead that the process of putting more money into a shaft than comes out of it cannot go on forever. The Ophir mine in Galbraith township, the Shakespeare mine at Webbwood, the Crystal at Lake Wahnapitae, the prospects in Davis, Kelly, Scadding and Rathbun, the Creighton gold mine, the big quartz dikes at Rossport, the numerous showings at Sturgeon Lake, all raised expectations that were doomed to disappointment. Practically nothing but the St. Anthony at Sturgeon came out of it all. Even the placers reported from the Vermilion Valley failed to show spots rich enough to warrant the working.

Later still, the pellucid waters of Lake Erie were alleged by clergymen, bankers, and other mining experts, to contain gold in abundance in the sandbanks covered by their waves. An old Californian miner had found it, and only a fatuous government refused them the privilege of taking it out. At the end of a long tale of disappointment one might fairly ask, What is the matter. Is there no gold in Ontario? No paystreaks there?

Beyond doubt much of the failure was due to inexperience and lack of skill, much to the choice of unlikely locations, partly also to too great a hurry for dividends, and partly to downright dishonesty and stock-jobbing. Stamp mills were run up and equipped before it had even been shown that the mine contained ore enough to keep them running. Sometimes the value of ore decreased with depth, sometimes the vein pinched, sometimes it faulted, sometimes it split ,sometimes there never was any. The record is discouraging enough, sufficiently so to put a check upon sanguineness when a new gold field is discovered.

Yet it is a long lane that has no turning. The prospects at Porcupine will not all prove to be mines, but some of them will. The Hollinger and Dome are mines now, and there are others not so large whose outlook is more than promising. The field was opened under auspicious circumstances in that the two principal deposits fell into strong hands, capable of proving them without recourse to the stock market, and that are still in control. Diamond drill bores promise richness in depth, and the situation is full of hope. It must be remembered, however, that there are as yet no deep shafts in Porcupine, and until much lower levels are reached it cannot be held that uncertainty is wholly removed. The gold output for this year, however, will be the largest in the history of Ontario, and 1913 and succeeding years should see many millions of Porcupine gold in circulation.

KINGSTON SCHOOL OF MINING.

New Mining and Metallurgy Building and Research Laboratories.

(Written for The Canadian Mining Journal.)

The School of Mining at Kingston, affiliated with Queen's University, formally opened its new Mining and Metallurgy Building on Wednesday, Oct. 16th. This building is the most modern of its kind and has been laid out so that mining and metallurgy may be presented to the students in the light of the most recent developments.

By the erection of this building, not only has the School of Mining assured herself one of the foremost places in the training of young men for mining and metallurgical engineering, but, as well, she will continue even more than ever to be a pioneer in the development of these sciences. The building has been laid out to make possible a wide variety of metallurgical research work.

One of the greatest sources of Canada's tremendous natural wealth is her mineral deposits. In Ontario alone are to be found the metals gold, silver, copper, nickel, cobalt, iron, lead and zinc, and a great variety of non-metallic substances. Canada supplies 70% of the nickel, and 15% of the silver for the world, and is practically the sole producer of cobalt. The development of these vast resources, so that humanity may at present benefit by them, and yet, so that posterity may not have cause to complain of undue wastefulness or extravagance, is one of the great problems of the day.

Proper development in these respects requires not only that new ways be found to increase the efficiency of production and the economy of utilization of the materials which are at present in use, but it requires that uses be found for the by-products of these processes of production, and for the great quantities of material which at present are being temporarily set aside in the rush for the obviously valuable. There is an ever increasing work to be done by the industrial scientist to keep the industries apace with the rapidly spreading boundary of scientific discovery.

This work is being done in part at the research laboratories of the various industries concerned. But, the largest problems, those which involve the welfare of every citizen, are often unsuccessfully undertaken, or not undertaken at all, by those in charge of these industries. For example, a large percentage of the zinc which goes into the melts in the process of the manufacture of brass, is volatilized, and passes through the flues, never to be recovered. This is not a loss to the manufacturer, but to the general public, who pay millions of dollars for this zinc in the increased price of brass. No individual concern has successfully found a way of avoiding this loss, nor has any concern a sufficiently large interest to warrant the expenditure of the money, the energy, and the time, which the solution of this problem would require. It is clearly the peoples' problem, and the investigation is now well under way for the United States Bureau of Mines at the Electro-chemical Laboratories of Cornell University. This is but a single instance among many.

Similarly the Canadian Government has undertaken to help in the solution of some of the numerous industrial problems which affect the Canadian people. Some of this work is being done at the Government Bureaus, and some is being done by the universities. Much of it can best be done by the co-operation of these two. Not only is it a function of the University to lend its laboratories and its professors to this sort of work, but it is its duty to train some of its students, having the necessary enthusiasm, so that they may have the scientific knowledge and the breadth of view to carry on researches of this type. The increasing demand for scientific investigation cannot fail to bring about greater co-operation between government and university in the future, which will affect them in all their relations.

With these facts in mind, the School of Mining has very wisely laid out a suitable portion of its new mining and metallurgy building for the establishment of a research department of metallurgy and applied electro-chemistry. This department has been in active operation since April of this year under the direction of Dr. H. T. Kalmus.

With the water power and coal situation as it is, the natural trend of development of many of the Canadian metallurgical industries will be through increased utilization of electric power. Hence this new research department has installed very complete electrical equipment. The power plant of the School of Mining has been enlarged for the purpose, and will soon be able to supply 120 kilowatts at 2200 volts to this laboratory. Suitable transformers, bus-bars, switchboards, etc., are installed so that electric furnaces may be operated at any current up to 3000 amperes, and at varying voltages up to 120 volts. This power equipment, with the most modern auxiliary apparatus, provides as complete an electro-metallurgical laboratory as is to be found anywhere in the world.

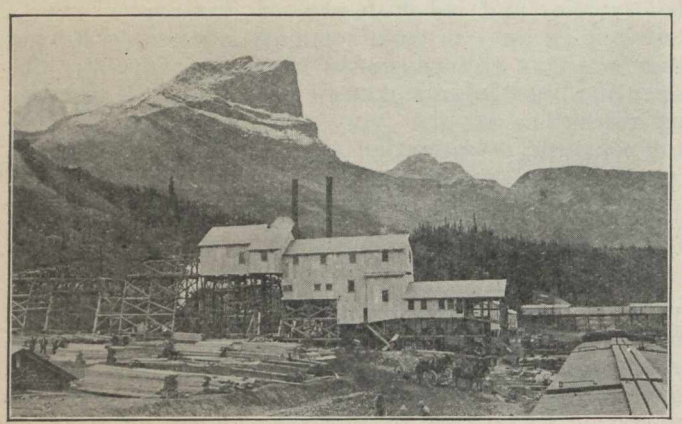
The first investigation, which is now well under way, and which is undertaken for the Mines Branch, Department of Mines, Ottawa, has to do with the utilization of the metal cobalt. Canada has produced, and is producing, millions of dollars worth of cobalt, of which only about one-third finds its way into the industries. Although this metal is in many respects similar to nickel, no important alloys of it with other metals are in use. An exhaustive series of researches is therefore being undertaken for the government on "The Metal Cobalt and its Alloys," for the purpose of increasing its usefulness in the industries.

No mention of this new mining and metallurgical department at Queen's would be satisfactory without noting that it was made possible by the magnificent munificence of Queen's own graduates. The building is called Nicol Hall after Prof. Nicol, whose extreme generosity made its erection possible, and it will stand as a lasting monument to him and to the large number of graduates whose gifts supplemented his.

THE JASPER PARK COLLIERIES.

Much interest is being taken in the development now taking place of an important coal area, on the line of the Grand Trunk Railway, some two hundred miles to the west of Edmonton. Of the several new collieries being established in this field, the Jasper Park is important. We are indebted to Mr. R. H. Morris, general manager of the undertaking, for the following account of the property and of the development operations to date:

The property of the Jasper Park Collieries, Limited, are situated at Pocahontas, Alberta, 208 miles west of



General View Jasper Collieries

Edmonton, and comprise four claims of 2,560 acres each, in all 10,240 acres. These claims extend on either side of the Athabaska River, and cover an area eight miles long, and two miles wide. The Grand Trunk Pacific Railway crosses the property on the south side of the river, while the Canadian Northern are now building their line on the north side of the river through the property.

Development work was begun on the south property in May, 1910; at this time the steel of the Grand Trunk Pacific Railway was at Wolf Creek, about 90 miles from the property. The first work consisted of prospecting, in building cabins as quarters for the men, in building trails and roads. The seams which were exposed about four miles south of the river were traced down near the line of the railroad.

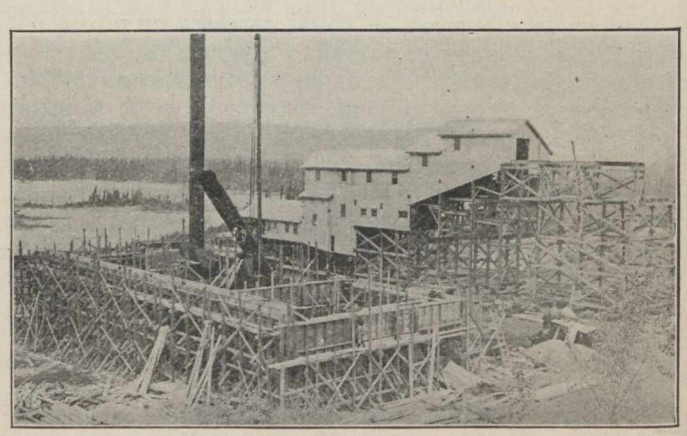
Work was then commenced on one of the seams at a point about 275 feet above the railway. This seam pitches from 50 to 56 degrees to the south-west, the line of the strike being S. 55 deg. E., and at about right angles to the line of the railroad.

A tunnel was driven on the outcrop of the seam which was partly in gravel, and partly in coal; the coal outcrop being covered from 16 to 25 feet with gravel in the first few hundred feet of the tunnel. At a point about 1,000 feet from the mouth of the tunnel an air shaft was sunk on the coal at a depth of forty feet, to the floor of the tunnel. Two hundred and twenty-five feet south from this shaft another was sunk on the coal, (about 18 feet when prospecting the seam), and when the tunnel reached this point, a connection was made to this shaft on the coal, the depth being sixty feet. From this shaft, a counter gangway was started and after leaving sufficient pillar to protect the shaft, rooms were started.

In the early development, the main difficulty was that of getting in supplies, all of which had to be freighted from Wolf Creek and Edson, a distance of 90 miles, over very poor roads. The steel on the Grand Trunk Pacific Railway was laid past the camp on June 17th, 1911.

The tunnel on the coal being 275 feet above the railway necessitated the installation of a hoisting plant, and a 30 h.p. friction drum two-motion American Hoist and Derrick Co. engine, and a 60 h.p. return tubular boiler, were installed. A tipple, wide enough to accommodate two tracks 36 inch guage was built of poles, and a home-made dump provided. The distance from the engine to the tipple is 1,200 feet on the incline, which varies from 13 to 28 degrees. The track on the tipple, incline, and in the mine, was laid with 16 lb. rail. Five-ton Fairbanks scales were installed on the tipple to weigh the coal in the mine cars, which are 1½-ton capacity, two cars being lowered in a trip. Connection to the main line of the railroad was made September 1st, 1911, by a siding 2,000 feet long, connected at both ends to the main line. The first car of coal was loaded on September 21, 1911. The present output is about 10,000 tons per month, and to date, over 85,000 tons have been loaded over the temporary plant. The Grand Trunk Pacific Railway has taken this entire output for locomotive use.

In order to increase the output it became necessary to instal a permanent plant of greater capacity, and accordingly a contract was let to the Roberts & Schaefer Co., of Chicago, Ill., for a complete and modern equipment of 2,000 tons daily capacity. Work has proceeded rapidly on the contract during the summer, and it is expected that in the course of the next few weeks the entire new equipment will be in operation. The plant consists of tipple, power plant, supply house



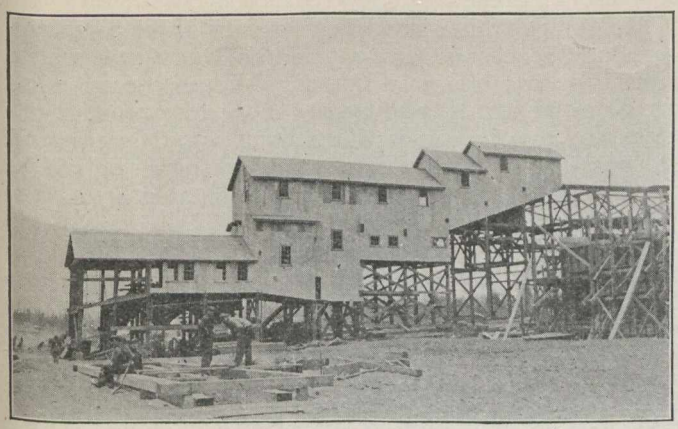
Reinforced Concrete Foundations of Power House

and shops, all of which are located on the flat near the main line of the railroad.

Since there is a considerable depth of gravel, sand, and clay overlying the coal seam on the face of the hill, a slope was sunk on the coal seam to what is the main tunnel 232 feet below the level of the upper tunnel. The mouth of this slope is about 1,500 feet from the face of the hill. From the foot of the slope the main tunnel on the coal was started and was driven 500 feet towards the face of the hill when the gravel wash was encountered.

Shortly after the main tunnel was started from the foot of the slope the line was projected to the face of the hill, and driving was begun to meet the tunnel

driving from the inside. The work progressed very favourably until a layer of quicksand and boulders was encountered. This occasioned much trouble, but on passing through the layer solid clay was reached, and it is anticipated that the connection will be made very shortly. Simultaneously with the driving of this con-



View of Tipple

nection, the main entry south with the necessary air-courses has been driven. When connected, 400 feet of gravel clay and sand will have been driven through in making the lower tunnel. The material from the slope has been handled by a 20 h.p. friction drum, two-motion, American Hoist and Derrick Co. engine, and a 30 h.p. internally fired boiler.

The tipple is a wooden structure, connected to the side of the hill by a wooden trestle, thence to the tunnel mouth by making a cut in the side hill. The tipple is equipped with a Phillip's cross-over dump. The coal from the dump goes to the feeder thence on to shaking screens of 1½-inch perforations. From the screens the coal goes to picking tables, the fine coal being deposited on the bottom of the tables, and the lump on top of the fine coal, which greatly facilitates picking. From the picking tables the coal is loaded into either box cars or gondolas, by adjusting the chutes. One 5-foot picking table is now being installed, but provision is made for the installation of another table for future requirements. These tables are the Roberts & Schaefer Co. design, and have a capacity of 200 tons per hour.

The loaded cars are fed on to the dump by a car feeder and are weighed over a 7-ton Fairbanks automatic dial scale. The empty cars after passing over the dump back switch to an empty car haul which elevates them. They are made up into trips by gravity. The tipple machinery is made by the Webster Manufacturing Co., of Tiffin, Ohio, after the design of the Roberts & Schaefer Co. The tipple machinery is driven by Westinghouse induction motors of 440 volts, 3 phase, 60 cycle, alternating current. A Christy portable box car loader is being installed, and is equipped with a 50 h.p. induction motor 440 volts. The railway cars will be handled through the tipple by a Fairmount car retarder. The tipple is sided with corrugated iron siding, and the roof is covered with asbestos roofing. The pickling table room is ceiled, has a double floor, and is heated by exhaust steam from the power plant, which also heats other parts of the tipple where necessary.

The power plant building is of reinforced concrete, the roof being covered with asbestos roofing. The building is 114 feet long by 45 feet wide, and has a solid wall partition separating the boilers from the engines and dynamos. In the boiler room four 150 h.p. 150 lb. pressure return tubular boilers, furnished by E. Leonard & Sons, have been installed. The boilers are set in batteries of two, and there is space in the boiler room for two additional boilers. In the boiler room are also the necessary pumps and heater. Coal is taken from the tipple screenings by means of two conveyors, which deposit the coal for boiler use in bins in front of the boilers. In the power room one 150 k.w. and one 50 k.w. 440 volt, 3-phase, 60-cycle, alternating current generators have been installed. These are made by the Electric Machinery Co., of Minneapolis, Minn. The 150 k.w. generator furnishes power to operate the necessary machinery of the plant, and the 50 k.w. generator is used for lighting and driving the fan at night. There is space in the power room for an additional unit to be installed. The supply house is a wooden structure 30x60 feet, with corrugated iron siding and asbestos roofing; ceiled on the inside with an office for the supply man, also the necessary racks. This building is located near the supply track and is convenient for unloading from the railroad cars. The shop building is a wooden structure, 30x90 feet, corrugated iron siding, asbestos roofing and ceiled on the inside. In this building are the machine, carpenter, and blacksmith shops. The shops are equipped with the necessary tools and machines, with a line shaft extending the entire length of the building which is driven by a 15 h.p. induction motor. The shop building is situated near the mouth of the tunnel and has a track extending the entire length inside the building, being connected to the main haulage road, making it convenient for taking in cars or locomotives for repairs. The greater part of the timber used in the plant has been sawed on the company's timber limit, which lies on the north side of the river. The lumber is sawed by contract, and brought down the river by raft.

The railway tracks will accommodate 60 empty cars above the tipple, and 60 loaded cars below the tipple. A Fairbanks 44 foot 60-ton empty car track scale is being installed above the tipple, and also a 44-foot 100-ton loaded car track scale is being installed below the tipple.

Ventilation for the mine is now being furnished by a six foot Sheldon fan, steam driven. A 15 h.p. induction motor is, however, being connected to the fan, which thus may be either steam or electrically driven.

Mining.

The seam now being worked has an average width of 8 feet and pitches from 50 to 56 degrees. The seam is clean, except for a small parting near the centre which varies from one inch to six inches in thickness. The mining is carried up the pitch in 15-foot breasts, 55 feet centres. The hanging wall and foot wall are of sandstone, with an occasional layer of shale adjacent to the rock. Where this shale occurs the coal parts very freely, as it also does from the sandstone. In drawing pillars the roof breaks freely, and a large recovery of coal is obtained. The upper tunnel is now in 3,700 feet, and has a lift of 300 feet above the tunnel which increases as work on the seam progresses. At present the coal is hauled by horses, and as it is expected to retain this mode of hauling for probably the next six months, permanent mechanical haulage has not been decided upon. Meanwhile the various types of haulage are being investigated, and special enquiry made concerning the storage battery locomotive. Wolf safety lamps are used in all the workings in coal, notwithstanding the fact that the mine gives

off very little gas. Monabel powder is used exclusively and electric batteries are employed in firing all shots.

There are two other seams to the west of the seam now being worked. The first is approximately 350 feet west of this seam, and from the outcrop showing is nine feet in thickness of clean coal. The other is 700 feet to the west of this seam, and shows twelve feet in thickness. These seams lie parallel to the seam now being worked, and pitch about the same angle. It is proposed to cross-cut to these seams from the tunnel of the present seam and bring all coal to the one plant. Approximately one mile to the east these seams are duplicated.

The coal is the bituminous coal of the Kootenay series. In the seam now being worked, the lower half of the seam is soft and mines in small flakes, while the upper part is harder, and mines more lumpy. In the lower tunnel, however, the lower part of the seam becomes harder. The following are analyses of coal obtained from a channeled sample across the seam from the two trenches:

	Top of Seam.	Bottom of Seam.
Moisture.	30	50
Volatile combustible ..	17.88	17.26
Fixed carbon	74.53	76.33
Ash.	6.32	5.20
B. T. U.	14974	14650
Sulphur.	97	71

This coal is an excellent steam coal, and by practical locomotive tests made by the Grand Trunk Pacific Railway, has equalled that of the best Pittsburgh coal. Tests that have been made of this coal show it to be a very good coking coal.

The town is called Pocahontas and derives its name from the fact that the analysis and character of the coal is very similar to that of the famous steam coal of West Virginia.

The company has now built twenty three-room cottages and seventeen four-roomed cottages, one twelve-room boarding house and a school house accommodating 50 to 60 pupils, and twenty more four-roomed cottages are now in course of construction. These houses are now being wired for electric lighting. The houses are well built, and make very comfortable homes for the men and their families.

A waterworks system is now being installed, the water coming from several springs about 1,000 feet from the houses. A well is being sunk at these springs, and as they do not freeze a constant supply of pure water is assured. A centrifugal pump, electrically driven, is being installed at this well, the water being piped through a 6-inch wooden pipe to a 20,000 gallon wood tank. The lateral pipes from the main are 4-inch in diameter, this pipe is buried 6 ft. 6 in. below the surface, and is well below the frost line.

The water supply from the town is carried down to the lower camp and thence to the plant, which not only supplies pure water, but affords a good fire protection.

A well equipped hospital is maintained, with a physician in charge, assisted by an experienced nurse.

The permanent plant is expected to be in operation about November 1, and by early spring a daily output of 1,000 tons is assured.

THE SEMI-ANNUAL MEETING OF THE CANADIAN MINING INSTITUTE.

The recent meeting of the Institute at Victoria and Frank was in the nature of an experiment. It is necessary that the big meeting of the year—the Annual meeting in March—should be held in the East. From attending this meeting Western members are debarred by reason of distance. They miss, therefore, one of the main privileges of membership, for the annual meeting is an event always pleasureably anticipated by those who are in a position to attend it. Moreover, Western opinion on important questions affecting either the industry or the Institute's policy cannot be voiced. Hence the project of holding semi-annual meetings in the West. The selection of Victoria for the first of the series was, perhaps, a mistake. Victoria has no longer concern in mining, being entirely absorbed in the matter of real estate speculation. In consequence the local attendance was relatively small. But if small it was select; enthusiasm compensated for lack of numbers; and the warm welcome and kind hospitality extended to the visiting members by the Premier and Minister of Mines, Sir Richard McBride; by the Hon. William Templeman, Mr. J. J. Shallcross (President of the Board of Trade), and others, was a very pleasant feature of the occasion. Some twenty members of the Western branch, including Mr. M. E. Purcell, Chairman, and Mr. E. Jacobs, Secretary, were in attendance at the Victoria meeting; and it is but fair to mention here that the success of the meeting was very largely due to Mr. Jacobs' efforts. The visiting members included the President of the Institute, Dr. A. E. Barlow, who presided; Mr. R. W. Brock, Director of the Geological Survey; Mr. D. B. Dowling, Mr. C. Camsell, Mr. J. G. S. Dudson, Mr. O. E. LeRoy, Mr. C. H. Clapp, Mr. W. H. Boyd, Mr. L. O. Armstrong, and the Secretary of the Institute.

In Victoria, three sessions were held on Thursday, September 18th, and one session on the following day. On the Friday evening the Institute and its Western branch, acting as joint hosts, entertained Mr. Templeman, Mr. Shallcross and other gentlemen at a dinner given in their honour at the Empress Hotel. The meeting was then adjourned until September 30th, on which date two sessions were held at Frank, Alta. The meeting here was eminently successful, and, as already reported in our last issue, resulted in the organization and establishment of a branch representative of the coal mining interests of Southern Alberta and Southeastern British Columbia. The arrangements for the Frank meeting were undertaken by a committee comprising Mr. J. T. Stirling, who acted as convener, and Messrs. O. E. S. Whiteside, W. D. L. Hardie, R. W. Coulthard, W. F. McNeill, and Lewis Stockett, to whom heartiest acknowledgments are due. On the whole, it may be considered that the experiment of holding an

annual meeting of the Institute in the West has justified itself, and there can be no doubt that it will be a regular provision in the future.

VICTORIA MEETING.

The proceedings at the morning session on September 18th were opened with an address of welcome by Sir Richard McBride. In view of the interest attaching to his remarks his speech is here presented practically in extenso. He said:

"I can quite understand the difficulties in the way of ensuring a very large and representative convention of your association at this season of the year. Many engineers are still in the field and those engaged at the mines can ill spare a week's time away from their work.

"Permit me now to extend to you on behalf of the Government and myself a hearty welcome to British Columbia—a province long notable for the wealth of its mining resources.

"Speaking for a moment on the subject of the Provincial Department of Mines, with which off and on I have been associated for upwards of eleven or twelve years, I feel from various acknowledgments received from mining engineers, from responsible commercial bodies in the province, as well as from companies operating here, and from the miners themselves, that the departmental policy has been productive of generally good result. We have in the last few years made a special attempt at the consolidation of the laws with regard to the operation of coal mines, and, with the assistance of our technical heads and permanent officials, we have, I think, passed an Act which not only protects the workmen and safeguards life and limb to an extent, perhaps, not so well covered heretofore by the regulations, but are at the same time giving fair recognition to the mining companies and the interests that they represent. Our Coal Mines Regulation Act, I may say, has been commended, not only at home, as I have just stated, but from States in the Union where coal mining is a prominent industry and from the Old Land complimentary references have been received. We do not assert that the legislation in itself is perfect or that it represents the last word in the way of mining regulation, but we do claim that it is immeasurably in advance of anything that has been attempted heretofore in any of the provinces of Canada.

"In connection with coal mining, it may also interest you to know that Mr. W. Fleet Robertson, the provincial mineralogist, has been for some time in the Groundhog coal basin. You are aware that very favourable reports and some very authoritative statements have been made by eminent mining engineers with regard to the coal deposits in that section. The government, in consequence, decided to send Mr. Robertson with a party to make a full and complete investigation of the conditions in this field.

"With reference to metalliferous mining, I merely remark that the mining industry in the Kootenay districts and elsewhere appears to be taking on new life. The operators and prospectors are working side by side and the Kootenay districts seem to be about to repeat the history of their early mining days in respect of mining exploitation and development. From the Slocan excellent accounts reach us as to the condition of affairs obtaining in the various mines, and it is common talk now that the Slocan district never looked better,—never was more promising than at present. From Rossland the news we got of well-known properties still operating there is most encouraging. In the Boundary, too, work is proceeding apace; smelters are busy, the larger mines are being operated at full capacity, and there is every reason to say that that section from a mining standpoint is prosperous. In the coast district, the Britannia mines, on Howe Sound, which have been in operation a number of years, are now making good returns from ore shipped, while the Granby Company has undertaken the work of developing mining properties at Granby Bay, Observation Inlet. There seems to be in sight, in connection with that property, the erection of another smelter in the province within the next two years. The property at Granby Bay is very valuable. It has already been well proved and the company has determined to develop at that point a large mining centre. Conditions at Portland Canal are rather quieter, although some work is proceeding there. In short, the mining industry of British Columbia is showing signs of prosperity on every side; conditions generally are improving, and there is every reason to anticipate prosperous times for the future. So far as the Provincial Government is concerned, if there is anything that we can do consistent with the public interest to assist in the expansion of the industry and in its wholesome growth and development, we are ready to move at once.

"Before I conclude my few words of welcome this morning, I think it is proper to observe that I am sure your Institute, in common with the Government, now that Western mining conditions are improving, is anxious to see that any company promotion that is attempted shall be along legitimate and right lines. There has been nothing in the industry in British Columbia so disastrous as that which occurred in the early days of lode mining fifteen or sixteen years ago, when scores of companies were promoted without the slightest possible justification. These worthless concerns were floated and the shares sold to innocent purchasers (strangers and foreigners to the country), with the result that the good name of British Columbia was injured to a most serious extent. I feel sure that your association, as well as the Government, will provide, as far as possible, against a recurrence of these conditions by insisting that promoters shall be most careful to move along right and proper lines.

"I may conclude with a reference to what is taking place to-day in Kamloops in the foregathering of our Pioneers to celebrate the early discovery of the Thompson and Fraser veins' goldfields. Time, of course, has thinned their ranks. Fifty years is a long time, and when we consider the hardships and the trials the pioneer gold seekers had to undergo while finding their way to the Cariboo goldfields, it is gratifying to know that so large a number of the original sixty-two are present in the City of Kamloops to-day.

"Before I take my seat I would like to say that you have in Mr. E. Jacobs, Secretary of your Western branch, a very energetic and active official. It has always been a great pleasure to me and those associated with me in the Provincial Department of Mines to work with Mr. Jacobs. We have invariably found him painstaking and anxious always to get at the truth of anything that has to do with mining in British Columbia, and ever ready to go the utmost pains to ensure the accuracy of his statements when he writes for publication. I cannot forget, too, that we have here our old friend Mr. H. Mortimer-Lamb, the secretary of your Institute, who some years ago was closely identified with mining in British Columbia. We have always followed Mr. Mortimer-Lamb's work since he left us, and we are glad to see the success he has achieved in his new field. While he is now resident some thousands of miles from British Columbia, it is fair to say that

whenever opportunity offers he is only too ready to say a good word for this province.

"I thank you very much for the opportunity you have given me to address you this morning, and I trust that your deliberations, like those that have characterized all the meetings of your organization, will be fruitful of excellent results."

At the invitation of the President, the Hon. William Templeman then addressed the meeting as follows:

"I esteem it a privilege to have the opportunity of saying a word or two to the members of the Canadian Mining Institute. I look upon your organization as one of the most important associations for the advancement of a particular industry that exists in Canada. During my regime, or my temporary occupation of the position of Minister of Mines for the Dominion of Canada, I had much to do with the Canadian Mining Institute. As you know, Mr. Chairman, you are very familiar, I think, with all the facts; the Department of Mines was organized only four or five years ago, and, during the organization of that department, the members of the Government and myself frequently sought the advice of the Mining Institute.

"During my term of office the question arose regarding the necessity of providing a mining law for the Dominion. The Institute unanimously recommended that steps be taken in this direction, and, after a conference with the Premier and myself and others, it was determined that a mining law for the Dominion of Canada should be prepared.

"The Act was prepared by a committee under the auspices or direction of the department. It was prepared by a committee of gentlemen representing very largely the Canadian Mining Institute, who, for months and months, studied the various provincial mining laws and those of the States of the American Union to complete a mining act that would be as nearly the last word in mining law and mining regulations as it was possible to have. I am quite sure that a mining law by the Dominion that would commend itself to the provinces would do a great deal towards accomplishing uniformity in mining laws throughout the Dominion—a thing much to be desired. So that, speaking of this, I deside to say that whatever has thus far been done towards preparing a law for the Dominion of Canada is due to the great interest, the intelligent interest taken in the subject by the Canadian Mining Institute. It is the great power behind the Mining Department at Ottawa at all events, and it is the power to which the department, during my time, looked for assistance and aid, and never looked in vain.

"It is to be hoped that the Institute will impress upon the Dominion Government the absolute necessity of completing the organization of the Department of Mines. It is most important to my mind that the Department of Mines should be made one of the leading departments of the Dominion Government. There is a strong feeling here that there should be a separate Minister of Mines. It would be a very excellent thing if we could have a separate portfolio of that kind, but we all realize that the Cabinet at Ottawa now includes some fourteen ministers, and the Premier might not deem it good policy to add another. Nevertheless, with whatever department that of mines is allied, it should not be subordinate to the other business of that department. For instance, just at the moment it is a branch of the Department of the Interior. That department is an enormous one. Any minister who attends to the duties of the Department of the Interior will have his hands full, regardless of mining matters. I am afraid the great importance of the Department of Mines will be lost sight of in such an enormous department as that of the Interior. If, therefore, it is not deemed expedient to create a separate portfolio, the Government might, at all events, reorganize matters in such a way that the Department of Mines would dominate the department to which it is attached. This is what really was intended under the first organization, because the Department of Inland Revenue, while very important in the sense of revenue, is less important, to my mind, in the development of Canada than is the Department of Mines."

The President, after thanking Mr. Templeman for his friendly references to the Institute, remarked that it was, of course a non-partisan body. This was fully realized, and he had no doubt that the present Government might be depended on to further the interest of the mining industry, and would unquestionably take the resolutions of the Institute into account.

Addresses were also made by Mr. J. Beckwith, Mayor of Victoria, and Mr. J. J. Shallcross, President of the Board of Trade. Some of Mr. Shallcross' remarks were particularly pertinent. To quote him in part:—

"One phase of the mining industry which appeals to me," he remarked, "is that it so enormously broadens the basis of prosperity. We know that in other countries they have had severe disasters because of one element only was the mainstay of the national life. Australia depended entirely upon the sheep industry, and a succession of droughts brought disaster. The same phenomenon was seen in Ireland, where they relied entirely on one crop—the potato. France depended on her vineyards, and when disaster overtook these vineyards, she was brought next door to ruin. In this country we have seemed to be rather too much dependent on one serial—wheat; and that might have put us in a position of great danger were it not for the development of other sources of wealth; but none of these other sources is so important as the mining industry. British Columbia's total mineral production is equivalent to one-third of the total mineral production of the whole of Canada. That is a very important factor, and one that contributes in a very great degree to the financial stability of this section of Canada.

"It is not only in the production of minerals that the mining men have shown their importance to the community, but they have spread the Dominion of Canada always farther and farther to the north. There would have been no Canadian Yukon if it were not for the mining men, and it is now proposed to establish a steamboat line, under control of a Canadian company, to establish communication eight hundred miles to the north and northwest of Dawson into the Fairbanks section of Alaska. This extension of territory is entirely due to the mineral industry. In the northerly section of Canada, the Mackenzie Basin, mining will, before long, promote settlement and prosperity. The production of gold and of other mineral wealth is sufficient to cause settlement anywhere, no matter how unfavorable the climate conditions.

"Our own mineral wealth, as it is developed and utilized, will be a continual inducement to development along other lines. We hope to establish here before long a large shipbuilding plant, that will cause the manufacture of iron and steel plates and other similar industries."

(To be continued.)

PERSONAL AND GENERAL

Mr. James McEvoy, mining engineer, Toronto, Ont., has returned from examining several mines in Eastern Quebec.

Mr. A. B. Willmott and Mr. J. W. Astley have completed an important examination in Eastern Ontario. Mr. S. N. Graham was also engaged in the same work.

Dr. Frank D. Adams was recently the guest of honour at a dinner given at Albany, N.Y., by Dr. John M. Clarke, the State geologist, to celebrate the dedication of the new State's Survey and Museum Building. Dr. Adams also represented McGill University at the dedicatory exercises.

Mr. William H. Nichols has been elected president of the Granby Mining, Smelting & Power Co., in succession to Mr. G. M. Luther.

Mr. J. M. Forbes, secretary of the Eastern Townships Branch of the Canadian Mining Institute, of Thetford Mines, is at present in Europe.

Mr. L. A. Bonner, manager of the West Canadian Deep Leads, Ltd., has been arrested at Barkerville, Cariboo district, B.C., on a charge of dynamiting and destroying parts of the ditches used to convey water for gravel-washing at the Lowhee placer-gold mine, near Barkerville.

Mr. Chas. A. Banks, formerly of Auckland, New Zealand, is now manager of the Jewel gold-quartz mine and stamp mill, at Long Lake, Boundary district, B.C., in succession to Mr. R. Roberts.

Mr. Chas. H. Clapp, of the Geological Survey of Canada, has closed his season's field operations in the southern part of Vancouver Island, and left British Columbia for Ottawa, going via Seattle, San Francisco, Salt Lake City, and Denver.

Mr. Geo. A. Clothier, for some years superintendent of the St. Eugene lead mine in East Kootenay, is now superintendent for the Indian Mines, Ltd., which is developing a promising mining property in the Portland Canal district, British Columbia.

Mr. James Cronin, of Spokane, Washington, has taken charge, as manager, of the Standard silver-lead mine, near Silverton, Slocan Lake, B.C., to relieve Mr. Geo. H. Aylard, general manager of the Standard Silver-Lead Mining Company, for a period of six months. This company has been paying a monthly dividend of 2½ cents a share on 2,000,000 shares, total $50,000 a month, since it made its first dividend payment of 1¼ cents a share in April last. Including the amount of the October dividend, $325,000 has been divided among shareholders.

Mr. C. P. Hill, of Montreal, president of the Hillcrest Coal and Coke Company, operating a coal mine near Frank, southwest Alberta, has been visiting the coast cities of British Columbia.

Mr. E. Jacobs, of Victoria, is visiting Kootenay and Boundary mining districts of British Columbia, obtaining information relative to the progress of mining in 1912, for use in his Annual Review of Mining in British Columbia for that year. He will be in Spokane, Washington, late in November, to attend the annual convention of the American Mining Congress.

Mr. G. C. Jaynes is now superintendent of the Surprise mine, in Slocan district of British Columbia, having succeeded Mr. F. E. Cummins who had charge of mining operations during the latter part of the time taken to do the difficult work of connecting, by means of an 800-ft. raise, a low-level adit with the old workings above.

Mr. H. E. Knobel, for some time engaged in directing the prospecting of mineral claims in Portland Canal district, B.C., is now connected with coal-mining property in Alberta. During October he paid a visit to Victoria, B.C.

Mr. R. G. McConnell, of the Geological Survey, left British Columbia about the middle of October, to return to Ottawa, after having spent the field-work season of this year on the Pacific coast.

Mr. Louis Pratt, formerly managing silver-lead mines in Slocan district, B.C., but during recent years with the P. Burns & Co. syndicate in connection with their mining interests, is in Europe.

Mr. Clive Pringle, of Ottawa, who is a member of the Retallack & Co. syndicate, owning the Whitewater group of mines, in Slocan district, British Columbia, recently paid a visit to that province.

Mr. A. B. Ritchie has returned to British Columbia after having spent a few months in Eastern Canada. He is now at the Consolidated Mining and Smelting Company's Molly Gibson mine, in Nelson mining division.

Mr. Wm. Fleet Robertson, provincial mineralogist for British Columbia, recently proceeded to Nelson to be present at a demonstration by Mr. A. Gordon French in connection with the latter's claim that platinum metals occur in ore and dike matter in the vicinity of Nelson.

Mr. R. H. Stewart, of Trail, B.C., general manager of the Consolidated Mining and Smelting Company of Canada, Ltd., was in Toronto last month to attend that company's annual general meeting of shareholders.

Prof. Francis A. Thomson, dean of the College of Mining at the Washington- State School, Pullman, Washington, visited mines in Ainsworth camp, B.C., in October.

SPECIAL CORRESPONDENCE

ONTARIO.

COBALT, GOWGANDA, SOUTH LORRAIN

NIPISSING PRODUCTION.—Nipissing produced $226,420 last month and shipped $290,473. Of the shipments $252,844 was shipped as bullion. It is probable that the Nipissing will ship out no more ore from the mine, but that any low grade they may mine before the low grade mill is ready to run will be left in the stopes. Developments underground during the month were quite satisfactory. Cross-cutting from the Kendall shaft some high-grade ore has been picked up under the Little Silver vein, a hundred feet below the open cut where the Little Silver vein was mined in the early days of the camp. A new branch of the Meyer was also picked up and drifted upon for 80 feet showing three inches wide of 2,000 ounce ore. A new vein, probably an off shoot of 101, showed about two inches of the same grade ore.

At shaft 64 exploration work is still continued, and the shaft is being sunk, while near the Savage boundary another level will be established, from which cross-cutting will be commenced.

SENECA-SUPERIOR DISCOVERY AT CART LAKE.—What has every appearance of being the most important discovery of the year on the smaller properties of the camp was made on the Seneca-Superior lease on Cart Lake last week. Some time ago the Seneca-Superior, a Rochester company, took over the Kerry lease on Cart and Peterson Lake and has been working them. The new management paid more attention to the Cart than the Peterson Lake lease, and their perseverance was rewarded when a vein of high-grade ore was cut at the 200-foot level. A cross-cut was being driven underneath the lake in a south-easterly direction, and at a distance of 440 feet from the shaft a vein of 2,000 to 3,000 ounce ore about three inches wide was opened up. The vein is in the conglomerate, and is well defined.

The strike will give the greatest encouragement to the properties working round Cart and Peterson Lake. So far the leases on Peterson and Cart Lake have met with but scanty success, the Little Nipissing and the Nova Scotia leases being the only shippers. On Cart Lake no ore had been discovered at all since the Nipissing abandoned their work there.

McKINLEY-DARRAGH ENCOURAGING.—Owing to a discovery of a wonderfully rich shoot of ore under Cobalt Lake the McKinley-Darragh-Savage is to day well ahead of its scheduled production. There have already been produced this year 2,240,000 ounces, or only 360,000 ounces less than for the whole of last year. The increase is very largely due to the 800,000 ounces taken from a very rich shoot of ore on the second swamp vein, as the mill has been treating about the usual grade of rock and the same tonnage as last year. The aerial tramway to transport the Savage ore from that mine to the McKinley-Darragh mill is almost completed, and it is probable that the mill will be enlarged. So far the ore has been handled by a sorting plant at the Savage, the tailings being banked for further treatment. It is estimated that there are 37,000 tons of tailings which will run fairly high in silver at the Savage now, and it will form a good reserve for a steady production of milling rock to the mill at the parent mine.

CONIAGAS RETURNS ITS CAPITALIZATION.—The Coniagas has now joined the list of Cobalt companies that have paid more than the total amount of their capitalization back to shareholders. There was some surprise when the May dividend declaration was made to find that three per cent. had been cut off the regular quarterly disbursement of nine per cent. As it was understood very generally that the reduction was necessary to again help the Coniagas smelter at Thorold, and not from any mine reasons, the declaration did not cause any uneasiness. On November 1, however, the Coniagas will not only pay their usual nine per cent., but will add the three per cent. held over from May 1. The Coniagas has now paid back to its shareholders 107 per cent., or $4,280,000. Five years of careful mining have been required to attain this end. For the first three years the Coniagas only paid 3 per cent. per quarter, no one at that time appreciating the great possibilities of the property. In the last two years the narrow rich streaks of high-grade have been found to be the centre of large bodies of milling ore.

TEMISKAMING AFFAIRS.—According to the quarterly statement of the Temiskaming Cobalt Mining Company there is yet to pay on the North Dome at Porcupine $55,000. The company has cash in banks amounting to $255,650, the smelters owe $65,802, and there is $34,261 in ore on hand. From this amount must be deducted the quarterly dividend of 3 per cent., $75,000, and the deferred payments yet to make on the North Dome, amounting to $55,000. The Temiskaming has now encountered at their 640-foot level enough silver in the diabase to greatly encourage them to go ahead and develop in that formation with a good hope of encountering rich ore there.

COPPER AND NICKEL FROM DANE.—Copper and nickel now form an integral part of the shipments from Northern Ontario camps. The Dane Mining Company shipped out one car of chalcopyrite which ran over 15 per cent. in copper, but they will send out no more until the sleighs can run over the snow. Underground operations have been discontinued in favour of diamond drill work, one drill operating to pick up the continuation of the ore bodies at depth, the other working on some other claims of the company near Swastika. There are two distinct ore bodies being worked, copper occurring in one place in a quartz gangue, and in the other as massive chalcopyrite ore.

The Alexo mine at Iroquois Falls continues to pour out a steady stream of ore. During September seven cars, containing 294.60 tons, left the mine for the Mond Nickel Company's works at Victoria Falls. The ore is being mined on a most economical basis, and a profit is being made despite the narrow market.

BEAVER.—The fact that values in the Beaver veins when they are followed in the diabase are distributed over a wider area, has led the management to resolve to increase the capacity of their plant to 120 tons in place of 60 tons. In the keewatin, the veins were very high grade, and the shoots were fairly wide, in the diabase these veins are broken up into stringers, and the wall rock between them will make good milling rock. The 600-foot level of the Beaver has just been reached, and on the main vein a shoot of 2,000 ounce ore has been opened up. On the Donaldson property at Elk Lake, which the Beaver auxiliary mines are working, a new shaft is being sunk to the 200-foot level. A good plant has been ordered, and can be installed as soon as delivery is made.

HOLLINGER DIVIDEND.—The Hollinger Gold Mines, Limited, has introduced the Porcupine camp as a dividend producer with a disbursement of 3 per cent., to be paid on Nov. 2. That, in all likelihood, dividends will be paid monthly is evident from the manner in which the first dividend is announced. "It is stated, notice is hereby given that a dividend of 3 per cent. on the capital stock of the company, being the first regular four-weekly dividend, has been declared payable 2nd November, 1912, to shareholders of record at the close of business on 25th October, 1912."

It is worth noting that the dividend is "four weekly," so that disbursements will probably be made every twenty-eight days or every lunar month. The amount involved in the first dividend is about $105,000. The news that a dividend had been declared came rather as a surprise to the general public, it being the general opinion that no dividend would be paid till the first of the New Year, when a substantial percentage would be declared and the mine would go on a regular quarterly basis. In adopting four-weekly

payments the Hollinger is following the example of the Crown Reserve.

REA WILL RE-OPEN.—Owing to the solid progress the Porcupine camp has made in the last two months a much better feeling is apparent everywhere. Assessment work is verywhere being carried out, and there are many rumors of properties opening up, that have been closed down for some little time. It is understood that the Rea mine will be opened up again before the new year. More capital will be introduced and a new board of directors will be appointed. The closing down of the Rea was one of the worst disappointments in the history of the camp, and the resumption of work will be hailed as a happy augury.

The opening up of the Tough claims at Swastika has led to a very careful examination of all the territory near Kirkland Lake in Teck and Lebel townships with the results that several promising discoveries have been made. The Costello, Terry, Wright, Hargreaves, and Oakes finds are all interesting. The Oakes discovery has just been made. The ore body is right on the contact between the porphyry and the conglomerate, precisely as the Tough's is. The gold is found in quartz stringers in the porphyry. It is understood that the two tons of ore shipped from the Tough claim ran $400 to the ton. It was taken from the surface of three different veins.

SWASTIKA MILLS.—At Swastika itself two mills should be ready to run before the first of January. The Swastika mill building is completed, but the machinery has not yet arrived, and as it has only been ordered recently delivery cannot be expected for at least a month. At the Lucky Cross excavations have almost been completed for the ten stamp mill. Five stamps will be installed at once and five later on. The first recovery will be made on plates directly below the stamps, the tails will go to a classifier and two deister tables, and will be re-ground in a pebble mill below which will be another plate and a slime table. Work underground is now confined in putting through raises to the surface and in sinking the shaft to the 200-foot level. Four raises are being put up, two on the vein 16, and one each on veins 18 and 11 respectively. The raise on No. 11 will also connect with veins 9 and 10.

NIGHT HAWK LAKE.—Quite a little excitement has been caused by the production of some very rich specimens from a vein discovered by a Montreal syndicate on an island in Night Hawk Lake. The claims are owned by Gordon Hyde and Fred M. Markey, both of Montreal, and the lead was uncovered in the course of assessment work. The island, which is only 150 feet in width, is on the eastern boundary of Cody township. The vein is but narrow. The claims were staked in the 1907 rush to Night Hawk Lake, when a number of Swedes found good ore on Gold Island.

LARDER LAKE.—Goldfields, Limited, is now dropping twenty stamps on ore at the old Harris Maxwell mill. The big crusher has been broken and when it can be repaired another ten stamps will be in operation. The ore is being mined from an open cut. There is apparently a large body of ore, but it is yet a matter of doubt if it is high grade enough to be handled at a profit unless a big tonnage is treated daily.

BRITISH COLUMBIA.

The fourth quarter of the year has been entered upon without serious interruption to the production of minerals in the Province, except at the coal mines of the Canadian Collieries (Dunsmuir), Limited, at which—both at Union and Extension Collieries—the miners have been on strike about a month. However, at the time of writing news has been received that some of the men have resumed work, so it is probable the trouble will have been settled by the time this shall appear in print.

Cariboo District.—While it is yet too soon to obtain dependable information concerning the season's results from placer-gold mining in Cariboo District, there is reason to look for a comparatively small yield of gold for 1912, since the season has been very dry in that particular district, and, as a consequence, the supply of water for gravel-washing limited. It is a remarkable thing that while to the south of the Cariboo placer-mining district the season has been unusually wet, in the part of the country whence comes the supply of water for placer-mining uses the opposite has been the case. It had been expected that the total of placer gold from Cariboo and Quesnel mining divisions of this district would be considerably larger than in several recent years, but the probability is that Cariboo division will show a further decrease, while Quesnel will have had the benefit of operations at two new properties, which should give that part of the district an increase, possibly large enough to fully offset the expected shortage in Cariboo division.

East Kootenay District.—Within the last few days—that is, during the first half of October—there have been reports of possible trouble at some of the Crow's Nest Pass coal mines, but it is earnestly hoped it will be averted. Save for occasional shortage of railway cars, work has been continuous at Crow's Nest mines in British Columbia, and it has seeme dthat the year's output of coal would be a comparatively large one. If there shall come a suspension of mining at the Crow's Nest Pass Coal Company's mines, the year's production of coal will be unfavourably affected accordingly. However, it may be that the men will continue at work, and if so the total output of the Southeast Kootenay coal mines will probably prove to have been larger than in any year in the past. This suggestion is made, though, without any statistics of output available, and only on the reports received of the mines having been worked with little interruption during the greater part of the expired nine months of the current year.

In metalliferous mining, the most important operations have been at the Sullivan Group lead-silver mine, near Marysville, which are reported to have already shipped this year, that is, during nine months of the calendar year, more ore than during the whole of the fiscal year ended June 30, last. For an output of about 21,000 tons in the last-mentioned year, the average metal contents were approximately 10 oz. silver a ton and 25 per cent. lead. A small number of men have been employed at the St. Eugene lead mine, but production has been very small in comparison with the output from this mine during earlier years. While work has been done on other mining properties, no production worth mentioning has been made. Placer-mining for gold has been continued on several streams, but only on a small scale.

The construction of the Kootenay Central Railway from Golden up the Columbia valley and thence down the Kootenay valley to the Crow's Nest Railway is being activly proceeded with, so mining will likely again have attention in these valleys ere long.

West Kootenay.—One of the most satisfactory features in connection with mining in this district is the fact that at least three metal-mining companies operating in West Kootenay have this year paid dividends. These are the Consolidated Mining and Smelting Com-

pany of Canada, the Standard Silver-Lead Mining Company, and the Le Roi No. 2, Ltd. The aggregate amount paid this year by these several companies is about $587,000, and there is good reason to expect that the Standard Company will pay $100,000 more before the close of the year. This reference to dividend-paying suggests that the following information concerning the Consolidated Mining and Smelting Company will be of interest:

Prior to the payment in October of the dividend of four per cent. declared at the Consolidated Company's annual meeting, no dividend had been paid by the company since November, 1907, so that nearly five years had lapsed since there had been a distribution of profits among the shareholders in the company. The original company was incorporated under Dominion charter as the Canadian Consolidated Mines, Ltd., with an authorized capital of $5,500,000 in 55,000 shares of $100 each. It acquired the properties of the St. Eugene Consolidated Mining Company, Centre Star Mining Company, Canadian Smelting Works, and Rossland Power Company. Under date February 26, 1906, the directors reported to shareholders that the St. Eugene, Centre Star, War Eagle, Trail Smelter, and Rossland Power Company had been consolidated, and that supplementary Letters Patent had been obtained changing the name of the company to "The Consolidated Mining and Smelting Company of Canada, Limited." The financial statement then issued showed a valuation of $3,900,000 as that of "mines, pjlants, smelter, refinery, stocks of other companies, etc.," and other assets of a total value of $798,888. The capital stock issued was $4,698,888. During the fiscal year ended June 30, 1910, an increase of the total of the authorized capital of $7,500,000 took place. At the end of June, 1912, the total of capital issued stood at $5,805,200; while the assets included mines, mineral claims, etc., valued at $4,774,861, and mining, smelting, and other plants at $1,412,975. At June 30, 1907, the liability to sundry banks was $1,723,709; at June 30, 1912, it was $343,820. The list of dividends paid by the company follows:

Dividend.	Paid.	Amount.
No. 1	May 1, 1906	$117,470
2	August 1, 1906	117,470
3	November 1, 1906	117,470
4	February 1, 1907	120,845
5	May 1, 1907	120,845
6	August 1, 1907	120(845
7	November 1, 1907	66,940
8	October 17, 1912	232,208
Aggregate of dividends		$1,014,093

Reference to individual mining properties in the several mining divisions of West Kootenay must be brief this month, but these will have attention later. In Ainsworth camp, the No. 1 and other properties are being worked by the Consolidated M. and S. Co. Across the lake from Ainsworth, the Blue Bell is producing freely and keeping its concentrating mill running. concentrate being shipped to the smeltery at Trail.

The Whitewater mines are being worked by Retallack & Co., and since the railway is to be extended from Bear Lake to Whitewater, the same company will resume work in the Deep mine of the same group. The Utica is being further developed, and about 400 tons of ore had been received at Trail this year from this mine up to the end of September. The Lucky Jim has been shipping zinc ore for two or three months, and it is expected that an output will be steadily maintained. The Rambler-Cariboo aerial tramway has been completed, and equipment of the concentrator is in progress. A number of mines about Sandon, Cody, and other parts of Slocan are being worked, while there is much activity also in Silverton camp, near Slocan Lake.

News of Nelson, Rossland, Boundary, and Similkameen camps is generally satisfactory, and these will have attention later.

Coast District.—There is much activity at the Britannia mines, on Howe Sound, also at the Granby Co.'s Hidden Creek mines, Observatory Inlet. Portland Canal and Skeena districts are also having development work done in them. Altogether, there is general progress in mining in British Columbia, and the outlook is promising.

COMPANY NOTES

GRANBY CONSOLIDATED ANNUAL REPORT.

The Granby Consolidated Mining, Smelting and Power Company, Limited, has issued its annual report for the fiscal year ended June 30, 1912. The annual general meeting of shareholders was held in New York on October 1. Among the directors of the company present were Mr. Jay P. Graves, of Spokane, Washington, vice-president and general manager, and Mr. Geo. W. Wooster, of Grand Forks, Boundary district, B.C., treasurer. At the meeting the number of directors on the board were reduced from 15 to 13 by the retirement of Messrs. Arthur Curtiss James, who resigned some months ago, and A. L. White. Mr. W. H. Nichols was elected president of the company, succeeding Mr. George Martin Luther, last year's president.

The general balance sheet, as at June 30, 1912, is as follows:

Assets.

Cost of lands, plants, etc. (less depreciation)	$15,081,000
Stocks and bonds	519,333
Hidden Creek property investment	979,461
Fuel and supplies	164,191
Cash and copper on hand	791,789
	$17,535,780

Liabilities.

Capital stock issued	$14,988,515
Dividends held	1,605
Accounts payable	19,539
Surplus	2,516,121
	$17,535,780

Published figures show that the quantity of ore smelted during the year under notice, at the company's works at Grand Forks, B.C., was 739,519 tons, consisting of 721,719 tons from the company's mines at Phoenix, and 17,800 tons of custom ore. The corresponding figures for the fiscal year ended June 30, 1911, were: Granby ore, 959,563 tons; custom ore, 24,783 tons; total ore smelted, 984,346 tons.

The metals produced last year and the latter shown here for comparative purposes) those produced in the fiscal year to June 30, 1911, were as under:

	In Fiscal Year Ended June 30, 1912.	June 30, 1911.
Copper, lb.	13,231,121	17,858,860
Silver, oz.	225,395	343,178
Gold	33,932	41,707
Amount realized	$2,874,759	$3,219,272
Working expenses, purchase of ore, etc.	$2,291,380	$3,001,856
Net profit	$583,379	$217,416

It will be seen that there was a general decrease, excepting only in amount of net profit earned. The several decreases were: In ore smelted, 244,827 tons. In metals produced: Copper, 4,627,739 lbs.; silver, 117,873 oz.; gold, 7,775 oz. In proceeds of metals sold, $344,513. The net surplus of assets over liabilities, after writing off $600,562 for depreciation, is shown as $2,516,121, as against $2,533,304 at the close of the 1910-1911 period, the decrease being $17,183. No dividend has been paid since December, 1910, but for some time past profits have been applied to payment of purchase money, and development and equipment costs, of the company's Hidden Creek property, near Granby Bay, Observatory Inlet, at which there has already been developed ore "estimated in sight" to an approximate total of 5,000,000 tons, with an average copper content of 2.3 per cent., or 46 lbs. to the ton. The "Boston Commercial" calculates last year's net earnings at $3.90 a share of the company's issued capital, as against $1.47 a share for the immediately preceding year.

It should be kept in mind when considering the results of the two years' operations, that conditions were unfavourable during part of each of the fiscal years. In his report for the fiscal year ended June 30, 1911, the general manager said: "The earnings for the year are not at all satisfactory, amounting to but $217,415.61 net profits. This is accounted for by the fact of the lower tonnage treated and the disconnected periods of operation, part of the furnaces being out of commission most of the time, causing increased costs, the low prices at which metal was sold, the lower recoveries from the ore, and the high price paid for coke and the inconvenience in securing it. The continued strike at the coal fields in British Columbia of the Crow's Nest Pass Coal Company, from which place we get our coke and which is the only present available source for our supply, caused the closing down of our plant about May 15th for six weeks, the strike having been in effect since April 1st." During the last fiscal year the smelting plant was inoperative for rather more than four months —from August 15th to December 1st. However, when smelting was resumed (and it has been continued ever since, without interruption) results were satisfactory, as indicating in the following extract from the general manager's report for the last fiscal year: "Since resuming operations at the smeltery, December 1st, 1911, the general results in unit cost have been satisfactory and except for the excessive cost of coke which was secured from the East for a time before shutting down, the operations for the year would have shown substantial improvement over the unit cost of any previous year. The plant is in excellent condition, and there is no reason known why we may not expect as good, or better, smelting results in the future."

STATISTICS AND RETURNS

COBALT ORE SHIPMENTS.

Cobalt, October 19.—The week's shipments contained twelve cars of high-grade, with only two low. The Penn-Canadian shipped a car of concentrates during the week, the second shipment since their operations at the old Cobalt Central property. Lost and Found, a North Cobalt property, appears with a small shipment of low grade. McKinley leads for the week.

The following are shipments in pounds:

Cobalt Lake	1 high	47,000
Cobalt Townsite	1 high	72,000
McKinley-Darragh	3 high	203,870
O'Brien	2 high	128,200
La Rose	1 h. 1 low	135,400
Hudson Bay	1 high	61,707
Crown Reserve	1 high	39,105
Penn-Canadian	1 high	67,509
Lost and Found	1 low	25,600
Buffalo	1 high	60,600
Totals	12 h. 2 low	340,991

The bullion shipments during the week struck a new high level. Nipissing and Crown Reserve were the only shippers sending their bullion to England Tuesday. Details follow:

	Ounces.	Value.
Crown Reserve	7,023.00	$ 4,353.64
Nipissing	154,273.52	99,521.03
Totals	161,296.52	$103,874.67

BRITISH COLUMBIA ORE SHIPMENTS

Ore shipments for the various districts and smelter receipts for the week ending October 12th, were as follows:

East Kootenay.

	Week.	Year.
Sullivan	518	24,331
St. Eugene	33	409
Monarch	36	1,139
Monarch, milled	425	8,575
Other mines	...	235
Total	1,012	34,689

Rossland.

Centre Star	2,627	123,819
Le Roi No. 2	560	20,303
Le Roi	967	35,632

Le Roi No. 2, milled	300	7,100
Inland Empire, milled	90	1,350
Other mines	...	291
Total	4,544	188,495

Boundary.

Granby	25,814	987,417
Mother Lode	6,157	293,475
Unnamed	166	9,737
Rawhide	6,153	189,093
Napoleon	392	8,078
Belcher	425	885
United Copper	77	1,171
Surprise	59	4,058
Nickle Plate, milled	1,500	59,600
Jewel, milled	200	800
Other mines	...	20,012
Total	40,943	1,574,326

Slocan and Ainsworth.

Bluebell	181	1,535
Silver Horde	25	95
Standard	235	6,925
Van-Roi	31	1,946
Richmond-Eureka	37	1,111
Whitewater	33	649
Standard, milled	400	14,000
Van-Roi, milled	1,100	45,900
Bluebell, milled	200	2,500
Other mines	...	10,953
Total	2,242	85,614

Nelson.

Hudson Bay	18	583
Molly Gibson	19	2,003
Emerald	109	1,282
Granite-Poorman	30	283
Granite-Poorman, milled	250	11,100
Mother Lode, milled	500	8,250
Queen, milled	300	10,200
Molly Gibson, milled	300	6,000
Other mines	...	5,987
Total	1,596	45,688

B. C. Copper Company's Receipts.
Greenwood, B.C.

Mother Lode	6,157	293,475
Unnamed	166	9,737
Rawhide	6,153	189,093
Napoleon	392	8,078
Belcher	425	885
Other mines	...	17,003
Total	13,293	518,271

Granby Smelter Receipts.
Grand Forks, B.C.

Granby	25,814	987,417

Consolidated Company's Receipts.
Trail, B.C.

Centre Star	2,627	123,819
Le Roi No. 2	560	20,303
Le Roi	967	35,632
Sullivan	518	24,331
St. Eugene	33	409
Monarch	36	1,139
Bluebell	181	1,535
Silver Horde	25	95
Standard	235	6,925
Van-Roi	31	1,946
Richmond-Eureka	37	1,111
Whitewater	33	649
United Copper	77	1,171
Surprise	59	4,058
Hudson Bay	88	583
Molly Gibson	19	2,003
Emerald	109	1,282
Granite-Poorman	30	283
Snowstorm	118	118
Other mines	...	15,356
Total	5,783	242,748

TORONTO MARKETS.

October 24.—(Quotations from Canada Metal Co., Toronto).
Spelter, 6.35 cents per lb.
Lead, 6.15 cents per lb.
Antimony, 12 cents per lb.
Tin, 52 cents per lb.
Copper, casting, 18½ cents per lb.
Electrolytic, 18½ cents per lb.
Ingot brass, 11 to 15 cents per lb.
October 24.—Pig Iron (Quotations from Drummond, McCall & Co., Toronto).
Summerlee No. 2, $23.00 (f.o.b. Toronto).
Midland No. 1, $22.00 (f.o.b. Toronto).
Midland No. 2, $21.50 (f.o.b. Toronto).

GENERAL MARKETS.

Coal, anthracite, $5.50 to $6.75.
Coal, bituminous, $3.50 to $4.50 for 1¼-inch lump.

Coke.

Oct. 22.—Connellsville Coke (f.o.b. ovens).
Furnace coke, prompt, $3.75 to $4.00 per ton.
Foundry coke, prompt, $4.00 to $4.25 per ton.
October 22.—Tin, Straits, 50.25 cents.
Copper, Prime Lake, 17.60 to 17.80 cents.
Electrolytic copper, 17.50 to 17.70 cents.
Copper wire; 19.00 cents.
Lead, 5.10 cents.
Spelter, 7.60 cents.
Sheet zinc (f.o.b. smelter), 9.00 cents.
Antimony, Cookosn's, 10.50 cents.
Aluminium, 26.25 to 28.00 cents.
Nickel, 45.00 cents.
Platinum, ordinary, $45.50 per ounce.
Platinum, hard, $48.00 per ounce.
Bismuth, $2.00 to $2.25 per lb.
Quicksilver, $41.00 per 75-lb. flask....

SILVER PRICES.

	New York cents.	London pence.
October 8	64⅛	29⅝
" 9	63⅞	29½
" 10	63⅜	29¼
" 11	62¾	29
" 12	....	29¼
" 14	63¾	29 7/16
" 15	63½	29 5/16
" 16	63⅜	29¼
" 17	63⅛	29 5/16
" 18	63⅝	29⅜
" 19	63½	29 5/16
" 21	63¼	29 3/16
" 22	63	29 1/16