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ASSISTANCE TO PROSPECTORS.

Mr. J. B. Tyrrell, whose thoughtful articles we are always glad to publish, has recently made a practical and helpful suggestion. The railway companies every year grant special rates to sportsmen. Hundreds of townspeople, mostly the well-to-do, leave town during the fishing and hunting seasons. To these folk the railways offer special inducements. Reduced rates are given. Attractive folders, containing information regarding lake and river fishing, or describing the haunts of moose and deer, are widely distributed.

This policy is profitable to the railways and to those in search of recreation. But of infinitely greater profit to the country at large would it be were the railways to use similar means to encourage prospectors to explore the virgin fields of all our Provinces.

If specific geological and topographical data could be obtained from the railway offices, and if the inducements of cheap rates and special trains were held out, there is no doubt that many persons, now unable to afford the outlay, would spend their holidays not in the wanton destruction of animal life, but in searching for valuable minerals—an employment that cultivates mind and body alike.

A movement of this kind will meet with the warmest approval and co-operation of all mining men. The Canadian Mining Institute will be able and willing to contribute effective assistance.

This appears to us to be one practical method of encouraging the prospector. There are, no doubt, other means just as good. Therefore we shall be glad to receive letters from any of our readers who have given the subject thought.

EXPANDING MARKETS.

THE CANADIAN MINING JOURNAL is constantly receiving enquiries for ores of rare metals. Amongst the most urgent enquiries have been several from the United States for molybdenum ores. An editorial note to this effect in a recent issue elicited many answers. A few of these answers were interesting. Most of them, however, were vague and meaningless. A large proportion of the properties referred to were totally undeveloped and of unknown value. Moreover, their owners were unwilling to spend money in ascertaining their extent and character, and were holding them with a view to effecting their sale at figures unreasonably large.

Instead of securing the opinion of a mining engineer who could advise concerning development and who could evaluate the property when developed, the owners prefer

to allow their claims to lie idle. This, however, by the way.

What we wish to indicate is that almost daily we receive enquiries for ores of tungsten, molybdenum, manganese, antimony, etc., etc. For the first two there is a very marked demand.

We shall, therefore, be glad to hear from owners of mineral properties who are either prepared to ship ore, or have prospected their areas sufficiently to know what they have.

SUMMARY REPORT OF THE GEOLOGICAL SURVEY—1907.

The despatch with which the Geological Survey of Canada has issued the summary of its labors during 1907 is creditable to all concerned. Its early appearance has set a pace that should be followed by Provincial Departments.

Unlike its predecessors, the summary for 1907 is a short, succinct resume. Formerly the annual summary reproduced a full account of the field work and investigations of the staff. The 1907 summary is a departure. It is an actual summary. It presents a concise outline of operations in the field and in the laboratory. Heretofore the summary has, in a sense, duplicated the various individual reports that were to appear later. Hence it was valuable to the general public, especially if the separate reports happened to be delayed, as was often the case.

Now, however, the case is different. The publication of a summary within a fortnight of the close of the old year, makes it incumbent upon the Survey to complete and issue the reports of its geologists and specialists at a very early date. Otherwise the public will be kept waiting for information that is of utmost importance.

In short, the Survey has set a pace not only for the Provinces, but for itself. This excellent summary will be meaningless unless the reports of each of last summer's geological parties is promptly forthcoming.

Meanwhile we congratulate the Minister of Mines on this new indication of efficiency.

A WESTERN BRANCH OF THE C.M.I.

On another page are given full particulars of the organization of a Western Branch of the Canadian Mining Institute at Nelson.

In the selection of its officers this offshoot of the present Institute has been particularly fortunate. Mr. A. B. W. Hodges is president, and Mr. E. Jacobs is secretary. Mr. Hodges is one of the outstanding figures in the mining circles of British Columbia. Mr. Jacobs, the able and fearless editor of the British Columbia *Mining Record*, is probably the best unofficial authority on Western mining affairs. Under his management the *Record* has proved itself a clean, reliable journal. Mr.

Jacobs will undoubtedly perform the duties of his office with enthusiasm and discretion.

The remoteness of British Columbia mining centres from the East has made it impossible for many of the members residing in that Province to attend the annual meetings of the Institute. For this reason the Western Branch has been organized. Western members will now be able to meet for discussion of matters of moment whenever necessary. They will be enabled to deal promptly and weightedly with local issues and, at the same time, their support and advice will be of greater value to the parent institution.

LEAD BOUNTIES.

A petition, signed by practically all the owners and managers of silver-lead mines in East and West Kootenay, is about to be presented to the Dominion Government. The petitioners ask for an extension of the lead bounties.

Originally the Government appropriated \$2,500,000 for the purpose of assisting the lead industry. This sum was to have been paid out in five annual payments of \$500,000. The bounty period of five years expires in June of this year. So far, owing to restrictive conditions attached to bounty payments, only \$600,000 has been paid out.

It is claimed with justice that the Dominion Government, having given a moribund industry a new lease of life, cannot now withdraw its aid. Additional force is lent to this argument by the consideration that only a fraction of the original appropriation has been expended. The lead producers are therefore approaching the Government with entire confidence that their reasonable request for an extension of the lead bounty will not be refused.

INSPIRED "NEWS."

An item has been going the rounds of the press, and has unfortunately been reproduced in one or two technical journals, to the effect that a "corps of government engineers" employed by the "Dominion Government" had undertaken to solve the question of the depth and persistence of the silver deposits of the Cobalt districts. The item is untrue. Whatever basis some of the statements may have in fact is not a matter of public information. But the paragraph in question was written by an irresponsible person, who was either designedly misinformed or was himself untruthful. The question of the depth of Cobalt veins is working itself out every day. There is, however, no short cut to knowledge of this sort.

Neither the Ontario Government nor the Dominion Government has done any diamond drilling on the Gillies limit.

The Annual Meeting of the Geological Society of America, at Albuquerque, New Mexico.

CYRIL W. KNIGHT.

The Geological Society of America held its twentieth annual meeting in Albuquerque, the chief city of New Mexico, on December 30th and 31st, 1907. An informal session of the council was held in the Alvarado Hotel late in the evening of December 29th, on the arrival of the train from Chicago. The following two days were devoted to business and to the reading of papers, President Charles R. Van Hise being in the chair. A list of the papers is given below. The sessions were held in Hadley Science Hall, University of New Mexico, the president of which, William G. Tight, was untiring in his efforts to keep things running smoothly.

North America), mention is here made of the paper on the subject by President Charles R. Van Hise. He gave a splendid review of pre-Cambrian geology. In the spirited discussion that followed it was brought out that all agreed in the fundamental principles of classification, and that it was merely in the nomenclature that the dissenters found fault.

It was the expressed opinion of the society that the meeting was one of the most successful and instructive in its history.

During these two days most of us found time to visit what is known as the "old town" of Albuquerque, which

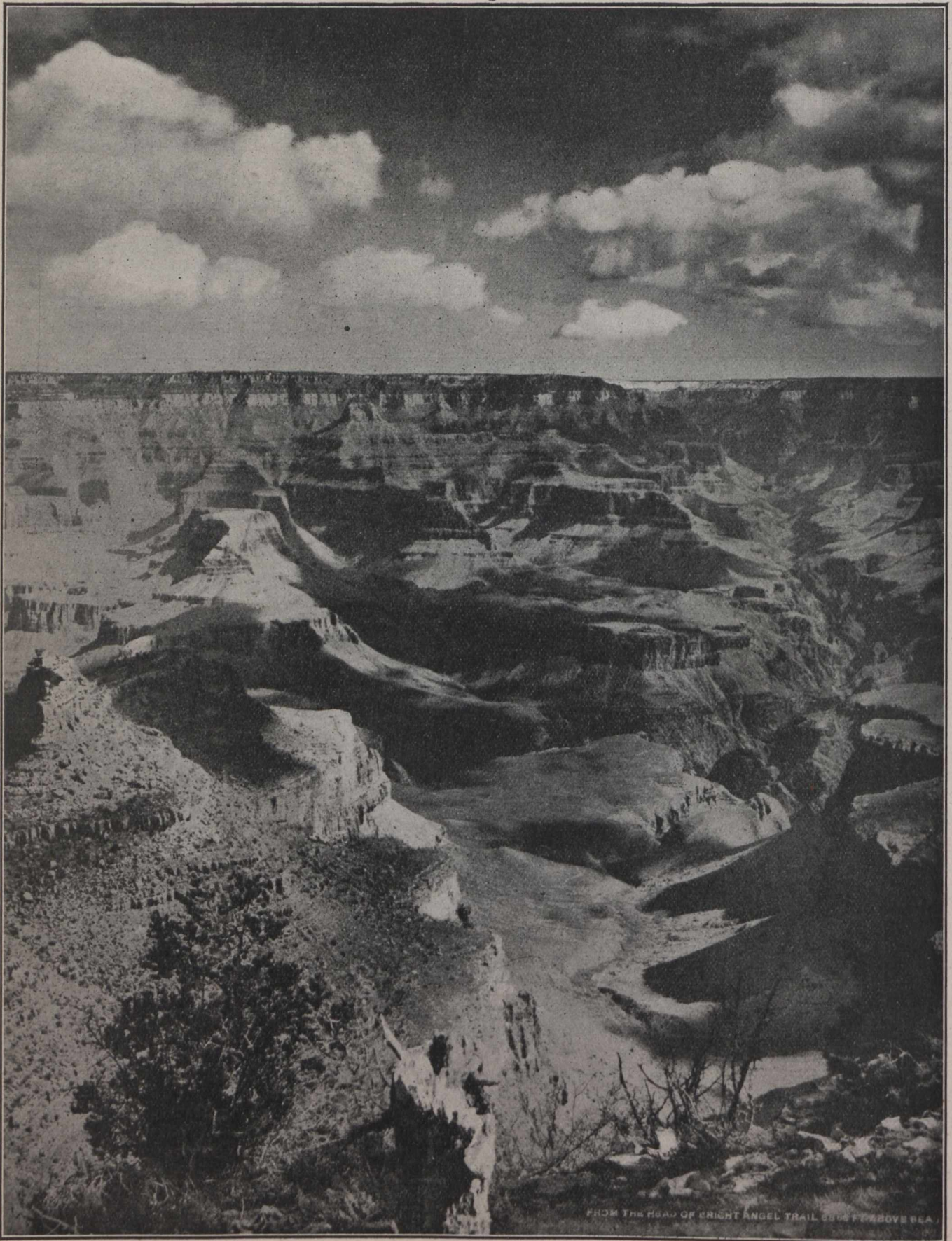


Members of the Geological Society of America, in the Sandia Mountains, near Albuquerque, New Mexico, between seven thousand five hundred and eight thousand feet above the sea.

The annual dinner of the society was held the evening of the 30th. It was over before ten o'clock, and was a source of keen enjoyment in its delightful informality, no toast list having been prepared. The following evening a reception and dance was given at the Commercial Club of Albuquerque and some of us had the pleasure of meeting and dancing with the most charming type of Southern girlhood.

There were fifty one papers presented or read by title. No attempt will be made, therefore, to give synopses or go into the discussions. But in so much as Canadians are particularly interested in pre-Cambrian geology (Canada having the largest areas of these rocks in

has as yet escaped the dominating influences of American civilization. Here the easy-going, sun-loving Mexican lives in his adobe. The latter is built of sun baked clay bricks, to which some straw has been added. One building near the Roman Catholic Church was said to be two hundred and fifty years old. The church itself was one of those cool, dimly lighted buildings which must be extremely suggestive, to anyone with a spark of imagination or romanticism, of old time Mexican life. The few windows were high up and small and a soft, diffused, golden yellow light filtered through. It was cool, almost cold, compared to the warm clear air outside. As for the "soft voiced senoritas," to whom the railway



THE GRAND CANYON OF ARIZONA.

guide-book had referred with sublime and picturesque good faith, they failed utterly to materialize.

In one respect New Year's Eve was historical in Albuquerque. Gambling up to that night was not unlawful. We visited some of the gambling halls and saw the roulette wheel and other games in full swing. The places were crowded. But 12 o'clock New Year's Eve all these "joints" were compelled by law to close for the first time in hundreds of years.

New Year's Day was devoted wholly to a trip into the Sandia mountains (near Albuquerque), which rise over 10,000 feet above sea level. The excursion was made under the auspices of the Commercial Club of Albuquerque and the University of New Mexico. Four vans, each drawn by two teams of horses, left the city at seven in the morning. It was quite cold at that hour. After the first mile there is a gentle, gradual rise for ten miles until the foot of the mountains is reached. To one not used to desert country it was puzzling to note that on this gentle ascent the road seemed to be falling towards the mountain, but that always when we looked backwards it also fell away. It was merely one of those deceptive phenomena of the desert and mountain country. The ascent was continued until about one o'clock, through deep canyons and along winding arroyas, when an elevation of between seven thousand five hundred and eight thousand feet above sea level was reached. Here the party had lunch. Within a stone's throw the basal conglomerate of the Carboniferous was splendidly exposed, lying unconformably on quartzite and quartz schist of possibly pre-Cambrian age. The relationships of the pre-Cambrian rocks of the Sandia mountains have not been fully or satisfactorily worked out. We were keenly interested to find among them an old looking greenstone resembling the Keewatin series of Northern Ontario and the Lake Superior regions. This was intruded by granite. Besides the quartzite above mentioned there is a metamorphosed granite gneiss the relationship of which to the other three members was not clear.

After the sun was well up, even at this high altitude, it was warm and balmy. For the Eastern visitor the air was indescribably exhilarating. Here and there in the canyons we passed the adobe, and occasionally in the more open parts we met the solitary sheep-herder, with his herd all bunched together.

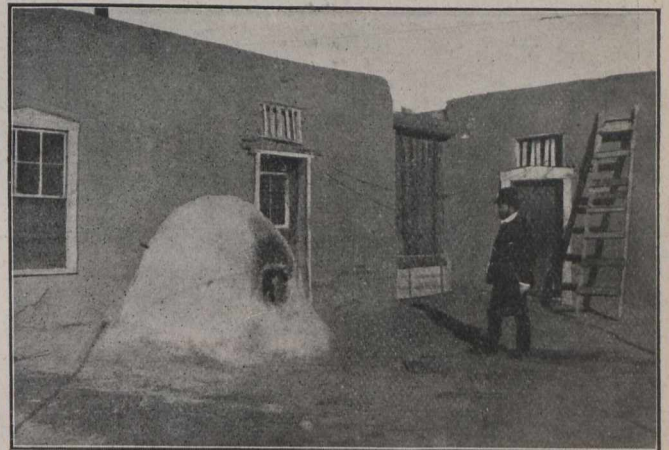
The return trip was made by a different route, giving us a chance to drink some natural carbonated mineral waters, and to see again the basal conglomerate of the Carboniferous, this time lying unconformably on the broken down surface of the metamorphosed granite gneiss above mentioned. We reached Albuquerque a little after dusk and the same evening took our sleeper for the West.

Before dawn the following morning (January 2nd) Adamana was reached. Our Pullman remained here for a day to allow a visit to the celebrated Petrified forest of Arizona. Most of the party got well loaded up with specimens of the fossil trees, the colors of which are very beautiful and the original structures well preserved.

We left in the evening for the Grand Canyon of Arizona, which was reached the following morning. For many of us this was the real point of interest on the trip. It would be puerile and uninteresting for a tyro to attempt a description of the canyon. All of us have read about it and will recall its total length of 217 miles. Its width for the fourteen miles we saw is 13 to 15 miles, and depth over a mile. The elevation of the rim is about 7,000 feet above the sea. To the reader these figures probably mean nothing, nor do they to the on-

looker. It is only when one has gone down, down, down on the trail to the bottom of the gorge that he realizes to some extent its depth. For the lower 1,000 feet the Colorado river has cut its way through granites and gneisses for all the world like our vast Laurentian areas in Canada. As seen from Grand View Point the series appears to have been eroded down to a plane. What is known as the Grand Canyon group of sedimentary rocks rests unconformably on this floor. On the gently up-turned edges of the canyon group rest, unconformably, Paleozoic beds, the majority of which are more or less horizontal. The Carboniferous is the surface rock. For those of us who had worked on pre-Cambrian geology in the thickly wooded, monotonous peneplane of Northern Ontario, where unconformities and relationships are with difficulty unravelled beneath their ubiquitous, glacial mantle, it was a source of delight to be able to see from the rim of the canyon such a profound succession of rocks.

But apart from geological considerations was the external beauty and grandeur of the chasm. Some of us were at the brink before daylight to watch the sunrise effects. No one will probably ever catch the coloring on canvas. One evening three of us had been quietly ab-



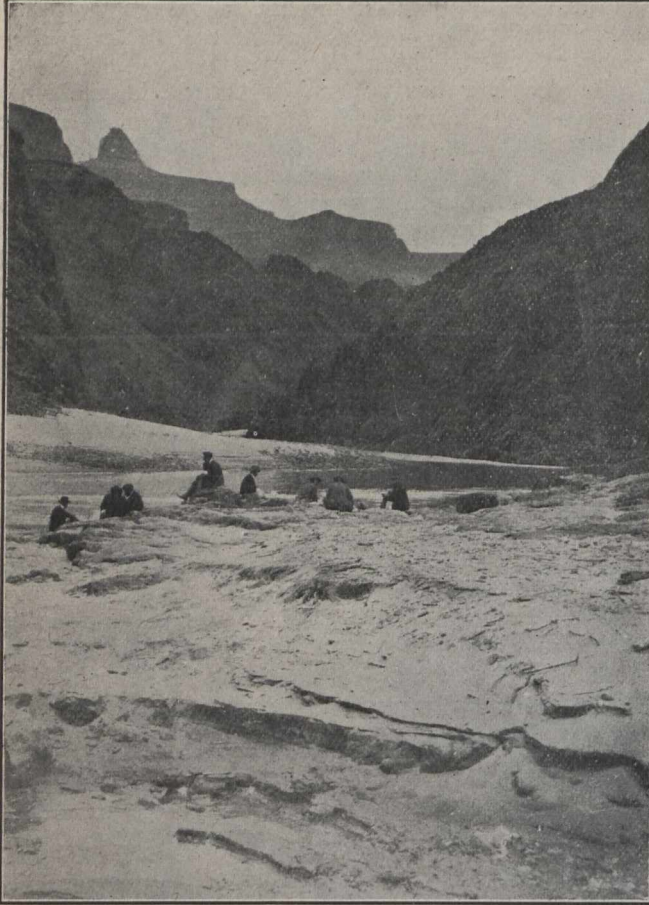
Mexican adobe in the "old town" of Albuquerque, New Mexico, showing in the left foreground. Dr. Ami, of the Canadian Geological Survey, on the right.

sorbing the scenery in front of the hotel, when four Western gentlemen issued from the door and walked to the side of the canyon. We had already experienced the different effects which a first glance produced, but it was rather startling to be brought back to earth by this expression: "By God, that's the deepest hole I ever see!" It was uttered with a nasal drawl and his earnestness was not lessened by the fact that he had dined not wisely but too well.

Some of the party made the trip down the Bright Angel trail on mules, while others, perhaps more energetic, preferred to walk. The distance to the bottom and back is about thirteen miles. A few of those who rode were novices on either horses or mules, and for them there were moments when thrilling was a tame word to apply.

Saturday evening, January 4th, the party broke up, the majority going home, but a few remained longer at the canyon before taking the train East.

The writer is not a member of the Geological Society of America, but it is with the permission of the secretary, Dr. Hovey, that this article is written.



Having lunch at the bottom of the Grand Canyon of Arizona, showing Colorado River.

LIST OF PAPERS.

President's address.

ECONOMIC.

1. A. C. Lane—Field Assay of Mine Waters. (15 minutes.)
2. Frank R. Van Horn—The Occurrence of Proustite and Argentite at the California Mine near Montezuma, Colorado. (5 minutes.)
3. E. H. Sellards—The Phosphate Deposits of Florida with Relation to the Underground Water Level.
4. Joseph Hyde Pratt—Asbestos Deposits of the Grand Canyon, Arizona.

PHYSICAL AND STRUCTURAL.

5. Charles R. Keyes—Ancient Tectonics of the Basin Ranges. (10 minutes.)
6. Charles R. Keyes—Rock-Floor of Intermont Plains of Arid Regions. (15 minutes.)
7. George D. Louderback—The Chief Features of the Stratigraphy and Structure of Mt. Diablo, California. (30 minutes.)
8. William Herbert Hobbs—The Earthquake in the Owens Valley, California, in 1872. (By title.)

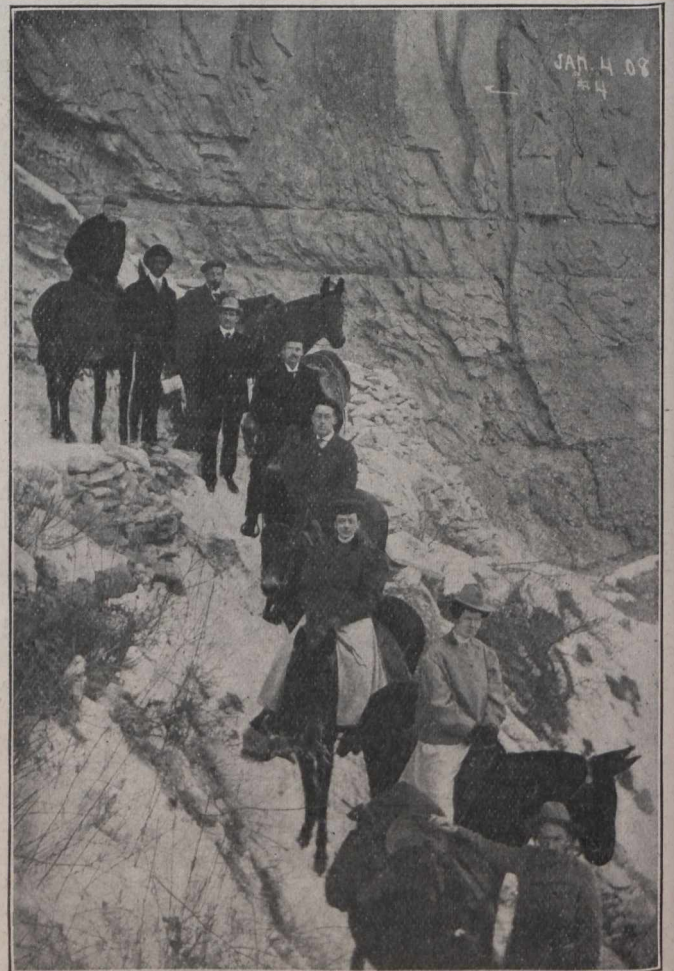
GLACIAL.

9. A. P. Coleman—Glacial Periods and their Bearing on Geological Theories. (20 minutes.)
10. Frederick W. Sardeson—Beginning and Recession of Saint Anthony Falls. (By title.)
11. Bohumil Shimek—The Nebraska "Loess Man."

12. Frank B. Taylor—The Distribution of Drumlins and its Bearing on their Origin. (By title.)

STRATAGRAPHIC.

13. B. K. Emerson—The Cirques and Rock-Cut Terraces of Mt. Tobey, Mass.
14. H. P. Cushing—The Lower Portion of the Paleozoic Section in Northwestern New York. (25 minutes.)
15. W. H. Sherzer and A. W. Grabau—A New Fauna from Michigan. (30 minutes.)
16. C. W. Hall—The Red Sandstone Formation of Southeastern Minnesota. (10 minutes.)
17. Frederick W. Sardeson—The Geologic History of the Redstone Quartzite. (By title.)
18. N. H. Darton—Geology of a Portion of Central Wyoming. (15 minutes.)
19. N. H. Darton—Some Features of Geology in Arizona and Western New Mexico along the line of the Santa Fe Railroad. (10 minutes.)
20. W. G. Tight—Relation of the Equus Beds of Kansas to Reversed Mississippi Drainage.
21. Willet G. Miller and Cyril W. Knight—Grenville-Hastings Unconformity. (25 minutes.)
22. A. C. Lane, C.S. Prosser, W. H. Sherzer, and A. W. Grabau—Nomenclature and Subdivisions of the Upper Siluric Strata of Michigan, Ohio, and Western New York. (20 minutes.)
23. A. H. Purdue—Structure and Stratigraphy of the Ouachita Ordovician Area, Arkansas. (20 minutes.)



Descending Bright Angel Trail at the Grand Canyon of Arizona. Dr. W. G. Miller, Ontario Provincial Geologist, and Mr. L. H. Kerr, of Toronto, in background.

24. John E. Wolff—Notes on the Crazy Mountains, Montana. (25 minutes.)

25. George Rogers Mansfield (Introduced by J. E. Wolff)—Glaciation in the Crazy Mountains of Montana.

26. T. A. Jaggar, Jr.—The Shaler Mountains, Unalaska, a Granite Core to the Aleutian Islands. (15 minutes.)

27. T. A. Jaggar, Jr.—The Growth and Destruction of Metcalf Cone, Bogoslof Islands, 1906-7. (15 minutes.)

28. W. G. Tight—The Sandia Mountains.

29. A. H. Brooks—The Geology of the Alaska Range.

30. J. S. Diller—Strata Containing the Jurassic Flora of Oregon. (15 minutes.)

31. A. H. Brooks and E. M. Kindle—The Paleozoic and Associated Rocks of the Upper Yukon Basin. (By title.)

PALEONTOLOGIC.

32. N. H. Darton—Discovery of Fish Remains in the Ordovician of the Blask Hills. (5 minutes.)

PETROGRAPHIC.

33. Horace B. Patton—The Topaz-bearing Rhyolite of the Thomas Mountains, Utah. (30 minutes.)

34. J. S. Diller—Local Silicification of the Knoxville. (5 minutes.)

35. B. K. Emerson—The Association of Pegmatite with Hornblende Border Beds of Granite and the Appearance of Large Isolated Masses of the Two Together Deep in the Granite. (10 minutes.)

36. George D. Louderback and W. C. Blasdale—Benitoite, its Mineralogy, Paragenesis and Geological Occurrence. (20 minutes.)

37. Ida H. Ogilvie—The Igneous Rocks of the Ortez Mountains.

PHYSIOGRAPHIC.

38. Amadeus W. Grabau—The Preglacial Drainage in Central-Western New York. 25 minutes.)

39. Charles R. Keyes—Geographic Cycle in an Arid Climate. (10 minutes.)

40. Alfred W. G. Wilson—Shoreline Studies on Lakes Ontario and Erie. (20 minutes.)

41. Douglas Wilson Johnson—The Faults and Folds of the Grand Canyon District. (By title.)

42. E. H. Sellars—The "Prairies" of Florida: A Stage in Topographic Development.

CANADIAN MINING INSTITUTE—TWO IMPORTANT NOMINATIONS.

The ballots soon to be issued to the members of the Canadian Mining Institute will include two names to which THE CANADIAN MINING JOURNAL wishes to draw especial attention. Mr. H. E. T. Haultain has been nominated for the position of Secretary, and Mr. Milton L. Hersey for the position of Treasurer.

The Institute is fortunate in having names such as these on its nomination list. Both of the nominees are Canadians who have attained honorable prominence and success in their respective professions. Both are active members of the Canadian Mining Institute and of foreign scientific societies.

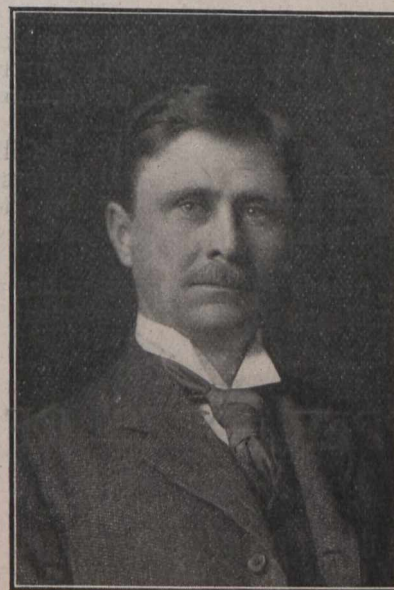
Mr. Haultain has been a true cosmopolite. His earlier education was received in Peterborough, Ont. Thence he entered the School of Practical Science, Toronto. After taking his degree from the University of Toronto, he took post-graduate mining work at Freiberg and London.

His early mining career began in Ireland and was continued in Bohemia, in which latter place he operated tin mines with success for a couple of years. His next move of importance brought him to Canada again, where in British Columbia he spent several years, chiefly in the placer deposits of the Fraser River, controlling there the investment of considerable sums of money in pioneer work for the handling of auriferous sands by dredging and hydraulic methods.

From here about the year 1896, during the height of mining development in the Rand, South Africa, he was appointed from London, Eng., to take a prominent position in that mining field. Several years were spent here in various responsible positions at a number of the large mines, and he was finally retained by an English company, operating a gold property in Swaziland, where he designed and built a large stamp mill. About this time he unfortunately met with an accident which put an

end to his career in South Africa, for the time being, and landed him in a London hospital for several months.

After this he returned to Canada where, with the exception of some time spent in the Western States, he has since remained engaged in a variety of mining under-



H. E. T. HAULTAIN

takings. In British Columbia he developed and operated a number of gold mines, designing and erecting the entire plants. During the same period, and subsequently he acted as consulting engineer with the control of other important mines. While there he invented what is known

as the Haultain-Stovel Grease Process, for the separation of metals and sulphides from slimes. This latter occupied nearly two years of his time and on its perfection he was appointed to a special position by the corporation controlling many of the largest lead mines in the Western States, to investigate completely the efficiency of their milling plants.

Later he devoted his spare time to research work, especially in the mechanical and lixivation treatment of ores. He is admittedly one of the foremost authorities on this subject. One of his successes during this period was the invention of a new apparatus for electrolytic laboratory work, which has been adopted by a great many of the chemical laboratories attached to smelters and mining plants throughout the States.

In the summer of 1905 he was called from Arizona to take the position of manager of the Canada Corundum Company's mines at Craigmont, Renfrew County, Ontario, where he has brought to a successful issue what is probably the most difficult concentration problem that has yet had to be solved. In recognition of his work here he was, about a year ago, appointed general manager of all of the company's interests. His experience here for the past three years, controlling a force of from three to five hundred men under extremely difficult circumstances, has brought him prominently into touch with mining life and interests in Eastern Canada, a field where he was but little known before.

In the year 1900 he applied for and obtained with very high standing the degree of Civil Engineering, University of Toronto. Since then he has been elected to Associate Membership in the Institute of Civil Engineering and Membership in the Institute of Mining and Metallurgy.

Mr. Haultain is a clear, forceful writer. His varied professional experience, his familiarity with mining methods in both the new and old world, and his deep acquaintance with technical literature, fit him peculiarly for the position to which he is nominated. As an executive officer and as editor of the publications of the Institute, his services will be of the highest rank.

The nominee for the position of Treasurer, Mr. Milton L. Hersey, of Montreal, is one of the foremost consulting chemists of the Continent.

Mr. Hersey, after graduating from McGill University, started in a modest way his present business of consulting chemist and assayer. A few years after obtaining his baccalaureate degree he applied for and obtained the degree of MSc.

For about twenty years Mr. Hersey has practised his profession in Montreal. To such an extent has his busi-

ness grown that he now employs a staff of twelve or thirteen assistants in Montreal, most of whom are trained specialists.

Mr. Hersey's work has been of such immediate commercial importance that, recognizing the value of his expert advice, not only the City of Montreal and the Province of Quebec have officially retained his services; but many of the larger railway corporations and industrial concerns have engaged him either permanently or from year to year.



MILTON L. HERSEY.

The management of a large commercial laboratory, conducted on modern lines, has brought Mr. Hersey into contact with mining men from all parts of Canada and the United States. He is himself largely interested in the mining industry of Canada.

Mr. Hersey is young, vigorous and capable. As an official of the Canadian Mining Institute he will have the advantage of previous experience in other scientific societies.

THE CANADIAN MINING JOURNAL, as the official organ of the Canadian Mining Institute, and as the representative of the mining interests of Canada generally, endorses most heartily the two nominations mentioned above. We are confident that the election of both Mr. Haultain and Mr. Hersey will be for the good of the Canadian Mining Institute.

COPPER ORES OF THE SUDBURY-SOO DISTRICT.

J. C. GWILLIM.

Along the line of the C. P. R. westwards of Sudbury, and towards Sault Ste. Marie, there is a wide belt of Huronian rocks, the home of the Huronian rocks, if one may be safe in calling them by their time-honored name.

Throughout this belt of rocks westwards from Webbwood there is a type of copper-bearing vein, of which the Bruce Mines vein is a good example. At the Bruce Mines the vein is a nearly vertical quartz chalcopyrite vein in a fissure across a large area of diabase; in other places these veins are in fissures or along contacts of other rocks as well as diabase. They are usually nearly

vertical, and they seldom carry much besides quartz, ankerite and chalcopyrite, and a little pyrites and specular iron sometimes in the more segregated or contact deposits. One is inclined to be surprised at the persistency with which these veins follow the general type over so large a district, and in such diverse rocks, diabase, quartzite, conglomerate and various highly metamorphosed ancient rocks.

The copper values, excepting superficially, are in the form of scattered chalcopyrite. The pay streak is not well defined or collected along either wall, or anywhere

else. Thus the rock is a milling rock, for the values in large tonnage rarely rise above 3 1-2 per cent. copper, with hardly a trace of gold or silver. Yet gold and silver veins do exist in their vicinity, as the Shakespeare mine near Webbwood and the Captive north of Bruce Mines and Rock lake testify, while silver is found with zinc and lead northwards from Garden River.

These bright quartz and yellow copper ores make very pretty displays in shop windows in various towns beside the great lakes, and have interested many people in their exploitation. Usually the mining rights belong to the farms who own the ground about these showings. Someone buys this right and the undeveloped prospect for a few hundred to five thousand dollars, shoots out a few sacks of ore and hires or uses a window for the display, calling for subscribers to put up money for development. In this way a few thousand dollars are raised, and work is begun.

The usual plan is to sink a vertical shaft at some point and do little prospecting or stripping elsewhere. The idea is to get down. After a time the funds run out, and since there is some trouble in realizing anything upon this class of ore, the work shuts down and the shaft fills with water.

Thus many hopeful prospects have now little to show but this timbered, water-filled shaft, and a dump which covers any adjacent surface showing. The natural inference is that if one pumped the water out one would only see the same thing as that which caused the development to cease, so that the ground is in a very unsatisfactory condition.

There is one strong point about these veins, they usually stay with one. There are few displacements or faults, and they have a considerable continuity both along the surface and in depth. Some of them, as Bruce Mines and Rock Lake, have produced quite heavily.

But Bruce Mines and Rock Lake, and every other producer, have met the same problem of a good saving by milling. The ores are not self-fluxing. They are far from it. They are low grade silicious copper ores, which look promising when copper is at a high price, especially to people who are wont to hear of the Michigan mines making money on ores of less than one per cent.; but these Georgian Bay ores are a totally different proposition, and they must be concentrated by some other method than by water to get a saving of over 60 per cent. or so. The copper pyrites floats as a yellow scum to a visible extent, and fine grinding is necessary to liberate the metallic particles.

Some experiments have been made with this ore by the vacuum oil process with exceedingly good results, both in the quartz-ankerite, copper-pyrites ore and the quartz copper pyrites ore. This process is not the same as the Elmore oil process. It uses less oil, so little that it is not thought worth recovering. Plants are operating in Cornwall and in South Africa; others are being put in at Golden and at St. Eugene mine, B.C., also one proposed for the Bruce Mines.

This process, together with a grouping of the best properties, may work out a reasonable return from these ore bodies, which in the aggregate may be depended upon to furnish a large tonnage.

There is not much prospect of a steady development under the present conditions, for the smelter propositions await the development of ore supply, and the would-be miners await the smelters, so that they may realize upon their ore as they develop their mines.

It seems curious that this ore, so prevalent and in a way so unique throughout so wide a district southwest of

Sudbury, is seldom met with in the northeasterly direction of the similar rocks towards Temagami and Temiskaming. There is, near Bear Island, on Lake Temagami, a property of Gibson and Dunlops' which is very similar in appearance, but usually copper showings do not follow the Bruce Mines type in form or contents.

In connection with this Sudbury-Soo district there is a lamentable absence of geological maps, or reports since the days of 1863 and Sir William Logan. Either the Provincial Bureau of Mines or the Dominion Geological Survey should investigate this portion of Ontario's great mineral-bearing strip.

ELECTROPLATING WITH CADMIUM.

The difficulties of electroplating with cadmium have been recently overcome, thus opening up an important use for the metal, which is now obtainable at a moderate price. The best results have been obtained from specially prepared cadmium carbonate, carefully purified, although the commercial salt has proven fairly satisfactory. The cadmium carbonate is dissolved in a solution of potassium cyanide, forming a clear, bright yellow plating bath, and a cadmium plate is used for the anode. A perfect deposit is had with either a hot or a cold bath, a temperature of about 125 degrees F. being preferred. The coating, though soft, is harder than silver, and the color is as white as tin but not so white as silver. The surface, which takes a very high polish, is not readily tarnished by sulphuretted hydrogen or other vapors.

BRITISH COAL.

The *Iron and Coal Trades Review*, December 20th, points out that some years an accepted axiom of Great Britain's coal trade was that the price of coal must be kept low so as to stimulate business. The experience of 1906 and 1907 has changed this. Although coal deposits for foreign lands are being worked on an unprecedented scale, yet British coal is in bigger demand than ever before. The hold of British coals upon the market is illustrated by the fact that the Germany Coal Depot Company, organized expressly for the supply of German coal to German ships abroad, has for some time relied almost entirely upon British fuel for its requirements on the Mediterranean or on the Atlantic.

MINERAL RESOURCES OF THE UNITED STATES IN 1906.

The twenty-third annual volume of the series, "Mineral Resources of the United States," published by the United States Geological Survey, is now passing through the press. This volume contains a statement of the production of mineral substances in the United States during 1906.

Practically the same form of arrangement has been preserved in all of the twenty-two preceding volumes of the series, and it has become so familiar to the mining fraternity as to render any description unnecessary. But for those to whom this volume comes as a new book of reference it may be explained that the book is divided into chapters, each of which treats of a separate mining industry for the whole United States. The student who consults this report to find a combined statement of the

mineral resources of a given State is referred to the tabular statement of output by States in the summary and to the index, in which, under each State, is a list of the minerals produced therein. The effort is also made to show the conditions of the domestic industry in relation to foreign conditions in the same mineral industry.

It is important, also, for the new reader to know that this volume is simply the consolidation of the separate chapters after they have been published in pamphlet form, frequently months in advance, and that these pamphlet reports, and not the final volume, mark the dates at which the reviews become available. Further, for greater statistical promptness, it is the custom of the Survey to give the principal figures to the public press in advance of the publication of the chapters in pamphlet form.

Several new names appear in this volume for 1906 as the responsible authorities in charge of individual chapters. This is in pursuance of the policy of the Geological Survey announced in the volume for 1905 of assigning all subjects to members of the Survey staff who, in this work and in allied problems, are employed solely in the Government service.

The report on iron ores for 1906 was prepared by Mr. Edwin C. Eckel, who, in past years, has made a special study of the iron ores of the south. The series of iron ore reports for the United States owes its statistical development entirely to Mr. John Birkinbine, of Philadelphia. Under his direction the statistics of iron ore production have been developed to an exceptionally high degree of accuracy. This has been due, fundamentally, to the great confidence given him by iron ore producers, among whom Mr. Birkinbine has developed a spirit of fraternity similar to that which Mr. James M. Swank, the general manager of the American Iron & Steel Association, has evoked among the iron and steel manufacturers.

The reports on copper, lead and zinc in preceding years have likewise been developed entirely by Mr. Charles Kirchhoff, of the "Iron Age," New York. These reports have become classic for their statistical accuracy and for their keen and fair analysis of the trade situation. The report on copper for 1906 was made by Mr. L. C. Graton, and those on lead and zinc by Mr. J. M. Boutwell.

This volume also records the change of the administrative head of the division of Mining and Mineral Resources from Dr. David T. Day and Mr. Edward W. Parker, Dr. Day devoting his time to the important work of preparing the reports on petroleum and natural gas.

The change of administration includes the placing of the statistics of metal production (except iron ores) under the supervision of Mr. Waldemar Lindgren, who has, as chief assistants, Mr. Chas. G. Yale of San Francisco, Mr. Victor C. Heikes of Salt Lake City, Mr. Chester Naramore of Denver, and Messrs. Boutwell, Graton, McCaskey and Siebenthal, of Washington. This arrangement has materially strengthened the work of the division.

It is designed also to supplement the statistical data with the results of geological and chemical research in so far as they pertain to the economic development of our mineral resources. The Division of Mining and Mineral Resources has been for some time an integral part of the Geologic Branch of the Survey, this incorporation having been accomplished when the present plan of organization was adopted.

By way of brief review and summary of the series, it may be said that in the twenty-seven years covered by

these twenty-three reports, the scope of the work has remained practically the same—an annual review of the mineral production of the United States and of the state of knowledge of the mineral deposits from which the products come. But the work involved has multiplied in two directions. In the beginning the statistical feature of the work was satisfied by an estimate as to the total output of each useful mineral. This estimate was based upon the best commercial estimate available, and the statistical correspondence was limited to a few hundred letters each year. When the control of the work passed into the hands of Dr. Day he took it with the intention of developing each statistical inquiry from an estimate into an accurate annual census through confidential reports at first hand, as rapidly as facilities would permit. This result has now been achieved with every industry except petroleum, and to this particular and difficult task he will henceforth limit his work. The correspondence necessary for this annual census of the mines of the United States has grown from a few hundred letters to an average of three written or printed communications a year to every known mine operator of the United States, more than one hundred and fifty thousand in all. In order to make such correspondence successful it has been necessary to send agents to the mines themselves, both for scrutiny of the statistical returns and in order to acquaint the operators with the nature of this inquiry and thus to secure the co-operation essential to success.

This growth of statistical work would have been necessary even if the mine development had remained stationary. Instead, the rate of increase has been far beyond all reasonable prophecy. In the twenty-seven years from 1880 to 1906, inclusive, the value of the mineral output of the United States has increased nearly five and one-fourth times. This marvellous growth is of additional interest in that it shows approximately by its fluctuations the financial ebb and flow of the whole country. From \$364,928,298 in 1880, the value has risen gradually to the immense sum of \$1,902,517,565 in 1906. This is the value of the mineral products in their first marketable condition, as shown in the first large tabular statement of the summary, where all unnecessary duplication is excluded.

It is of interest to note in passing that Pennsylvania produced nearly \$600,000,000, or about 30 per cent. of the total value of the output of 1906; Ohio about \$200,000,000, or 11 per cent.; Illinois, \$117,000,000, or 6 per cent.; New York and West Virginia, \$81,000,000, or 4 per cent. each; Montana, Colorado and Michigan, 3.5 per cent. each; Arizona and Missouri, 3 per cent. each; Alabama and California, 2.5 per cent. each. The value of the mineral output of each of the twelve States named was in excess of \$50,000,000. If the combined value of output of eleven of these States (\$905,000,000) be deducted from the total \$1,902,000,000 the value of output of the twelfth State, Pennsylvania (\$583,000,000), exceeds the combined value of output of all the remaining States of the United States by more than \$150,000,000.

Keeping pace with this growth has been a strain, and it is gratifying that the system has so expanded that the statistics of this wonderful production continually increase in completeness and accuracy. This attainment is largely the result of the hearty co-operation of the producers, due to their faith in the Survey.

In carrying out the plan of co-operation with the other divisions of the Geologic Branch a twofold advantage is secured. It brings to the statistical work on the one hand

a corps of trained men whose field observations have developed a keen appreciation of the geologic and economic importance of each mineral product. This has been particularly illustrated in the reports made by Mr. Lindgren and other mining geologists on gold and silver in the volume for 1905 and the reports on the same subjects and also on copper, lead, zinc and quicksilver in the present volume. On the other hand, the mining geologists have obtained and will continue to derive from their statistical work an insight into the industrial and

commercial conditions which so largely affect the demand for the different minerals and lead to the search for and the development of the mineral deposits with the geological relations of which their field work makes them acquainted.

The bringing together of these two classes of study of our mineral resources, that of their geology and manner of occurrence, and that of their statistics and economic conditions, is to be one of the special features of the future work of this division.

MINERAL PRODUCTION OF BRITISH COLUMBIA.

By E. JACOBS.

(Continued from last issue.)

The returns are not yet in from all the lead-producing mines, consequently there may be the necessity later of reducing the quantity now shown as the approximate production. On the other hand, the former appears to have been based upon information obtained from the lead smelters of the province, the output of which and the estimated quantity shipped abroad are indicated in the following preliminary figures:—

From.	Lb. of lead
Hall M. & S. Co's smelter, Nelson	6,329,243
Con. M. & S. Co's smelter, Trail	21,686,079
Sullivan Co's smelter, Marysville, and others	10,631,036
Exported to United States and Europe	7,900,995
Estimated production in 1907	46,547,352

Even should the revised figures, when obtained, confirm the Provincial Mineralogists's estimate, there will still be a decrease in value of this metal of \$348,714, of which, however, \$140,000 is attributable to the lower average price in 1907 as compared with that of 1906.

East Kootenay's production of lead was about 38,000,000 pounds, the larger proportion from the St. Eugene mine; the Sullivan was the only other important producer in this district. In the Slocan section of West Kootenay, the Whitewater was the largest producer with something like 2,700,000 pounds. The Standard, Vancouver group, Hewitt, and Rambler-Cariboo, were other Slocan producers, while the La Plata, in Nelson mining division, and the Silver Cup, in the Lardeau, also shipped a considerable tonnage of silver-lead ore.

The closing of the Hall Mining & Smelting Company's smelter at Nelson, and a temporary suspension of smelting operations at the Trail smelter while there were labor difficulties at Crow's Nest Pass coal mines, whence comes the supply of coke, in a measure interfered with the production of silver and lead ores.

COPPER.

The closing of the Boundary district copper mines, and others in the Nelson and Coast districts, respectively, during several weeks of November and December, effectually prevented an increase in the year's production of copper over that of 1906. There was also a restricted output during the spring, owing to a shortage of coke for the smelters and an occasional insufficiency of railway cars for ore and coke-hauling purposes. These adverse conditions resulted in a decrease of rather more than 10 per cent. in quantity of copper producer. If calculated at the average price for 1906 the loss in value

would be nearly \$900,000, but as that for 1907 was about three-quarters of a cent a pound higher, the production for this year shows a net loss of only \$610,000. When it is remembered that nearly 75 per cent. of the year's production came from the Boundary district, the effect of the closing of its mines during two to three months becomes evident. The Boundary's proportion of the total production of 38,392,000 pounds was nearly 28,000,000 pounds; Rossland and the coast each produced rather under 5,000,000 pounds; Nelson division's share was somewhere about 400,000 pounds. Of the 1,140,000 tons of copper ore shipped by Boundary mines, those of the Granby Company contributed 625,000 tons, of the British Columbia Copper Company 235,000 tons, of the Dominion Copper Company 155,000 tons, and of the Consolidated Mining & Smelting Company 125,000 tons. Rossland camp's ore tonnage was about 280,000 tons, in the following approximate proportions: Consolidated Mining & Smelting Company's Centre Star-War Eagle group 132,000 tons, Le Roi 113,000 tons, Le Roi No. 2 23,000 tons, and sundry smaller shippers 12,000 tons. On the coast the tonnage was approximately 100,000 tons, as follows: Britannia 57,000 tons, Tye 12,000, Outsiders 9,000 tons, Marble Bay 7,000 tons, Richard III. 4,000 tons, Lenora, 2,000 tons, and sundries 9,000 tons. The Queen Victoria, near Nelson; the Outsiders, Portland Canal, and the Ikeda, Queen Charlotte Islands, were new producers, and the Richard III. and Lenora, Mt. Sicker, Vancouver Island, resumed ore shipping after having been non-producers for several years.

IRON AND ZINC.

There was no considerable quantity of either iron or zinc shipped during 1907. On Vancouver and Texada Islands a few thousand tons of iron ore were mined and shipped to Irondale, Puget Sound, Washington, U.S.A. The most important event of the year in connection with the iron ores of the province was the examination by Einar Lindeman, a Swedish iron expert, of a number of claims taken up for iron ore on Vancouver Island and vicinity, for the purpose of reporting on them to the Dominion Department of Mines, Ottawa, which engaged him with the object of ascertaining whether or not iron ores occur in suitable quantity, variety, and quality, on the coast to warrant the expectation that an iron-manufacturing industry will eventually be established there. Mr. Lindeman's report has not yet been made, but before returning to Ottawa in December he stated that of the many properties he had examined during his five months' work on the coast there were four he considered

promising enough to warrant considerable development work to determine the extent of available ore; the quality he was satisfied with, but the quantity remained to be determined.

Shipments of zinc ore and concentrate were not large, and those made were from Slocan mines, several of which are, however, continuing to store the zinc concentrate made in milling ores for silver and lead. The uncertainty as to the final decision regarding the imposition of a duty on zinc ore sent to the United States remains an obstacle to much of this product being shipped to United States smelters. A comparatively small quantity was exported to Europe from a Slocan mine. No progress appears to have been made in the direction of operating on a commercial scale the Canadian Metal Company's zinc smelter at Frank, Southwest Alberta.

COAL AND COKE.

The production of coal in 1907 was the largest in the history of coal mining in the province. The net increase over 1906 was 339,000 tons (2,240 pounds), this bringing the year's production of coal disposed of as such up to 1,856,600 tons. All three of the larger companies shared in this increase. There were about 357,000 tons made into coke. The respective approximate proportions of production were:—

Company.	Tons of 2,240 lb.	
	Gross. Tons of 2,240 lb.	Net. Tons of 2,240 lb.
Wellington Colliery Co.—		
Extension mines..	434,000	
Comox mines ...	391,000	
	825,000	795,000
Western Fuel Co.—		
Nanaimo and Northfield mines	500,000	500,000
Totals for Vancouver Island	1,325,000	1,295,000
Crow's Nest Pass Coal Co..	877,442	550,600
Nicola Coal & Coke Co.....	11,000	11,000
Total production in 1907..	2,213,442	1,856,600

The Nicola Coal & Coke Company has been operating only about a year and most of its comparatively small production was of coal taken out in opening its mine. Several other companies will shortly be in a position to mine coal in quantities up to a few hundred tons a day each.

The coke output of the year was 227,000 tons—210,000 tons from the Crow's Nest Pass Coal Company's ovens at Fernie and Michel, and 17,000 tons from the Wellington Colliery Company's ovens at Union, Vancouver Island. In this year's estimate coal has been valued at \$3.50 a long ton and coke at \$6. In former years the respective prices were taken as \$3 and \$5, but the former are considered by the Provincial Mineralogist as average local market values for 1907.

The foregoing estimate differs from one made by the present writer early in December and sent to another mining journal. During the three weeks that have since elapsed, however, much more information has been obtained, hence the differences in the figures.

THE DEVELOPMENT OF THE LASH PROCESS FOR MAKING SOFT STEEL IN THE ELECTRIC FURNACE.

The Canadian Lash Steel Process Company, Limited, an Ontario organization, capitalized at one hundred thousand dollars (\$100,000), and having among its stockholders a number of prominent men in Canada, has just about completed, and will have in operation inside of six weeks, the largest installation of an electric furnace for the making of soft steel ever attempted.

This company has purchased a building at Niagara Falls, N.Y., and is installing therein a fully equipped steel plant, to be operated in connection with a 1,000 horse-power Heroult furnace, for the purpose of making steel by the Lash Process.

The Lash Process consists of making a mixture of concentrated magnetic ores, or iron ore sands, granulated pig iron and carbon, and charging the same into either an electric or O. H. furnace and producing steel. It is not a direct process in the strict sense of the word, but is an ore and pig process, the ore, however, being greatly in excess of the amount of pig iron used, and practically eliminating the scrap, using only such scrap as is made in the regular operation of a steel works.

The amount of pig iron required to make a ton of steel is less than one-half of what is required in regular open hearth practice, when the mixer is used in an electric furnace, on account of its non-oxidizing atmosphere; this feature, coupled with the fact that the rest of the mixture is iron ore, which is, of course, the cheapest source of metallic iron, will produce a ton of steel ingots at a price much lower than they are produced in regular practice, either in the United States or Canada, figuring the electric power required at its regular market price as sold in large quantities.

Canada, beyond a doubt, with its vast deposits of magnetic ores and iron sands, and its water powers, should be able through the development of some such process to become one of the largest steel producing countries, and command an immense export trade. This company having previously made a number of experiments on a moderate scale, in which the results were encouraging, have installed this large plant for the purpose of making a practical demonstration on a commercial basis. The plant was located at Niagara Falls, N.Y., solely for the purpose of gaining time, this location making it possible to procure immediately a building, transformers, and the power required for their installation.

The supervision of the plant is under the immediate direction of Messrs. Fitzgerald & Bennie, of Niagara Falls, N.Y., and Robert Turnbull, of St. Catharines, Ont., the Canadian representative of Dr. Heroult, whose furnace they will install.

Arrangements are being made with two of the best metallurgical and electrical experts in the world, one from England, and one from the States, to examine the process and make a full report. These experts will have every facility afforded them to watch the operations as the plant as before stated is being completed, with its laboratories, cranes, casting pits, etc., so as to operate night and day at a capacity of from 25 to 30 tons of steel per day. The steel after being cast into ingots will be sent into Canada to be rolled, and not only its chemical composition ascertained but also its physical qualities. The steel will then be shipped into the regular channel of trade.

Mr. Horace W. Lash, the president of this company, and the inventor of this process, has been connected for

years with the steel-making industry, and it was only after a long series of tests conducted by himself and a number of demonstrating heats made in the regular open hearth practice, that he permitted the process to be advanced as a commercial proposition. As to its use in regular open hearth practice, there seems to be no doubt as to the results.

Repeated tests show a yield above the average, a quality of steel entirely satisfactory, and a conversion cost not in excess of regular practice. Then it has been clearly shown that a better quality of steel is made, when the same is produced direct from the ore, instead of through the scrap and pig process.

In the electric furnace the quantity of pig iron required is very much reduced, owing to its being smelted in a non-oxidizing atmosphere. As pig iron is the most expensive material used in the making of steel, the reduction of its proportion results in a corresponding saving, and when the use of this pig iron is coupled with the ores themselves, the cost of producing a ton of ingots is much lower than the best practice ever brought out.

This process is, of course, a most interesting development for Canada, which country does not possess the required fuel, but does possess the water powers and the raw material; therefore, the results of these experiments will be most interesting. We are promised a report of these results after the plant is in operation.

Briquetting of Fuels in British Columbia—Description of Pacific Coal Company's Plant at Bankhead, Alberta.

BY G. J. MASHEK.

(Continued from last issue.)

All bearings are self oiling and the registering gears that actuate the second roll are also cut and have very fine face so as to practically eliminate any wear in that portion of the machine.

Figure 4, shows the type A Mashek briquetting press as installed in this plant. The briquetting rolls in these machines are made up of discs as shown in Fig. 5. The briquettes made in this machine are pillow-shaped, rectangular in one direction about 2 1-8 inches square by about 1 3-8 inches thick.

The object of making the press rolls of discs, all sides of which are machined, was for the purpose of making it possible to mill out the briquette pockets, as up to the time these machines were built it was found impossible to cast rolls in one piece.

The face of the roll shows dividing ridges about 1-6 inch wide between the briquette pockets, so that the full face of the roll is used at all times, making no waste and leaving no fines on the briquettes, as is common with the eggette shape made by the Belgian type press. This also saves a considerable amount of power in operating the machine. The power required is about 22 H. P. to turn out 12 tons per hour. The rolls made in this manner are the most expensive part of these presses and owing to the fact that the material from which they are made had to be soft enough to be machined and milled, considerable wear on these parts was caused, which required frequent renewals. This problem has within the last year been overcome by making the roll shells in one piece with pockets cast in, the material being so hard that it was necessary to grind the outer edges of the pockets. The life of this roll shell is about three times that of the built up one with milled pockets.

The construction also enables the machine to make better shaped briquettes leaving the corners more blunt. The briquettes drop out of the briquetting rolls on a belt conveyor and are taken to a distributor placed over a travelling cooling table, where they are distributed evenly over a width of 6 feet.

The cooling table consists of three endless belts made up of heavy roller chain, one chain on each side, running on channel iron tracks with spacing rods between the chains, on which are placed steel plates about a foot

wide. These plates are held in the horizontal position by means of tee iron tracks, and as they approach near the end of their run the track drops away and the load is gently lowered and discharged on the other side of this same belt. The briquettes thus pass from one course of the cooling table to the other until they are thoroughly cooled. At the bottom they are delivered to a scraper conveyor as shown, which conveys them to the shipping bins of the breaker allotted for this purpose. The briquettes remain on this cooling table about one hour. It is absolutely essential in all briquetting plants, if the

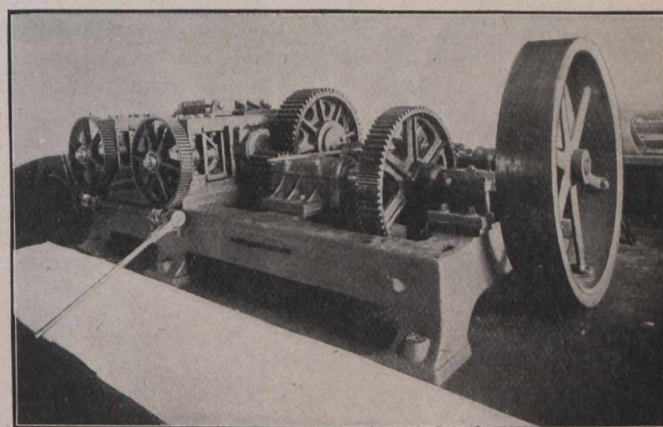


FIGURE 4.—Type A, Mashek Briquetting Press.

product is to be dropped into bins, that the briquettes be thoroughly cooled so as to avoid the possibility of smashing them on account of the inside of the briquette being still hot, although the outside may appear cool. Once the briquettes are thoroughly cooled there is absolutely no danger of them softening again in any temperature, nor is there danger of spontaneous combustion.

The pitch used in this plant is of ordinary roofing hardness, and grade D oil residuum asphaltum would be just as suitable for this purpose.

The pitch melting is done in a separate house as shown in Fig. 1, where the barrels are hoisted by a barrel ele-

vator to the second floor. On this floor the barrel staves are removed and the contents are dumped into any one of the three melting tanks. These melting tanks have a capacity of about 18 tons each and are set in brick-work heated by means of coal fires. They are set in such a manner that direct heat from the fire does not strike any part of the tank, thereby avoiding any danger of carbonizing the pitch, or of overheating any portion of the melting tank.

It requires from 20 to 24 hours to melt a tank full and raise the temperature of the pitch up to about 250 degrees F. After the pitch is melted it is pumped by means of a pitch pump through a 4-inch pipe to a similar tank in the briquetting plant, out of which it is being continually used while the plant is in operation. Three melting tanks are sufficient to keep this plant going 24 hours per day, although if more were installed the melting could be done a little slower which would also provide a reserve capacity at a vital point of the plant. Each unit of the briquetting plant is operated by a double 14 x 20 cylinder engines. The steam for the plant is obtained from the breaker boiler house, placed some distance away. For the atomizing purposes it is absolutely essential that the steam be dry and as hot as possible. For this purpose there is a steam superheater next to the melted pitch tank.

All the machinery shown on the plan is placed on the ground, the building is a frame structure of just sufficient strength to withstand the snow loads and carry the over-head line shafts. The cost of this plant complete according to original estimates was as follows:—

Machinery, F. O. B., New York,	
350,000 pounds	\$40,053.00
Duty 25 per cent.	10,000.00
Freight at \$1.80	6,300.00
Building and erection of machinery.	29,000.00

The total cost of the plant as outlined is \$85,353. This estimate was later modified by buying a large portion of the equipment in Canada and saving the duty. The cost of operation per ton of briquettes after a car-load sample had been briquetted in the United States is given below. This cost was arrived at by the writer and Mr. Bruce R. Warden, M. E., the Pacific Coal Company's representative, and all items were put in at the highest cost in order to be on the safe side.

COST OF RUNNING A 2 UNIT COAL BRIQUETTING PLANT.

Binder at \$10.00 per ton at Fort William,	
\$6.00 freight to Banuff using 7 1-2	
per cent. gross cost per ton of bri-	
quettes	\$1.20
Deducting the increase of weight of	
briquettes by addition of 7 1-2 per	
cent., binder valuing briquettes at	
at \$3.50 per ton, in bins of plant	.25
Net cost of binder per ton briquettes	.95
Labor per day—	
1 Watchman	\$2.50
1 Dust conveyor attendant	2.50
1 Cooling table and briquette con-	
veyor man	2.50
2 Men in binder melting room and	
general labor	5.00
1 Oiler	2.50
2 Men to run the two units	8.00
1 Superintendent	6.00
Total	29.00
10 Hour day making 220 tons of	
briquettes—per ton . . . . .	.13 1/2

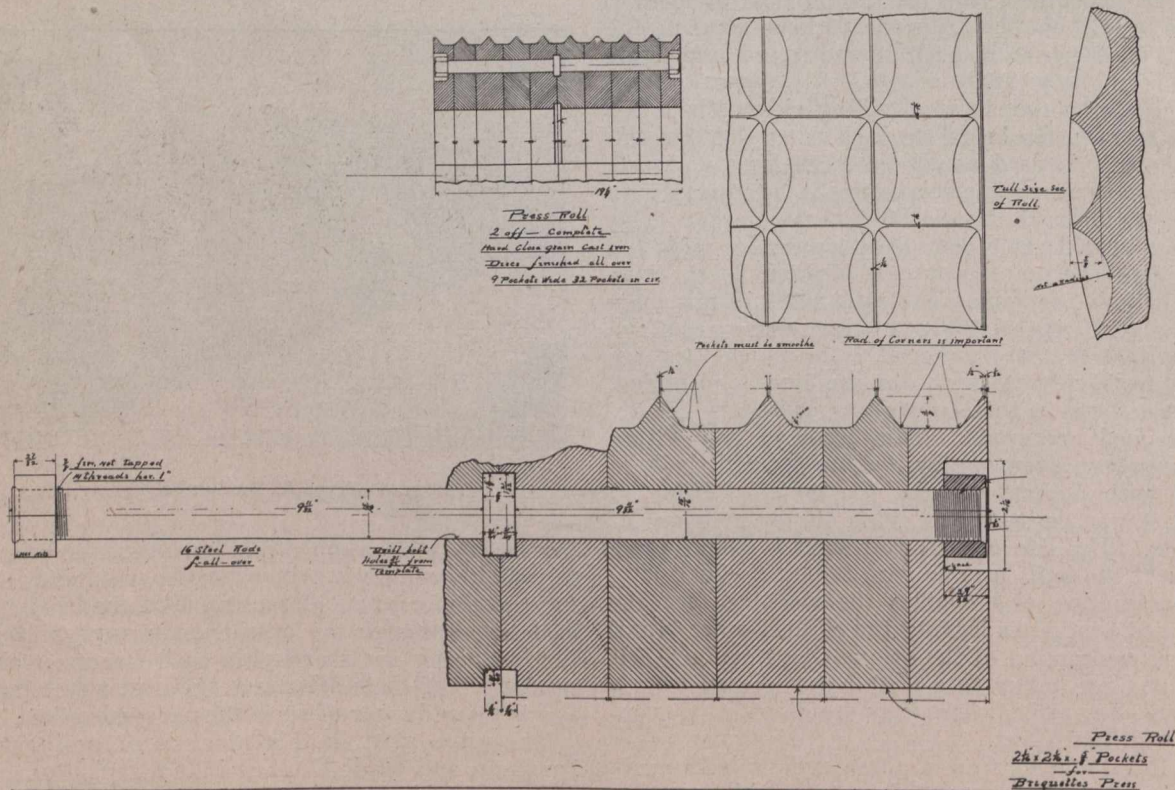


FIGURE 5.

Fuel Oil—	
2 1-2 gallons per ton at 5 cents per gallon .....	.121½
Power—	
300 H. P. coal for boilers at 40 cents, engines using 50 pounds of steam per H.P., and heating plant, cost per ton of briquettes .....	.05
Lubricating Oil—	
Per ton .....	.01
Breakage—	
Rebriquetting breakage of 5 per cent. between press and shipping cars .....	.04
FIXED CHARGES.	
Interest—	
Capital invested \$86,000 at 6 per cent., plant produces a minimum of 50,000 tons per annum—per ton .....	.10
Depreciation, wear and tear—	
Per ton .....	.10
Insurance—	
\$50,000 at .02 per cent., per ton .....	.02
Office expense—	
Bookkeeper, stenographer, stationery at \$3,000 per annum .....	.06
Total cost of manufacture (coal dust not included).	1.59

It will be noticed that fuel oil is figured in at 5 cents a gallon, but as stated above it was found that this oil would cost considerably more. Coal furnaces instead of oil furnaces were therefore installed to heat the dryers and mixers. This item, therefore, should be cut out and the cost of coal for this purpose put in. The cost of coal, however, is considerably less than oil.

As this plant was originally planned and designed as shown in Figure 1, only one unit of the briquetting machinery was installed. After that was in operation about a year the other unit was put in which at the present time ought to be about ready to start. The single unit has recently produced 9,100 tons of briquettes per month.

The atomizing of the pitch into the mixers as described above is patented in Canada and the United States, for the use of which there is a royalty of 10 cents per ton charged by the owners. There are a number of these plants in operation in the United States, equipped with a later design of press, and other improvements in mixers, etc. Also an improved method of introducing pitch into the coal dust has been developed and patented. This apparatus is sold outright and no royalty charged.

EXAMINATION OF WELL WATER AT COPPER CLIFF.

J. W. RAWLINS.

During the summer and fall of 1906 the Town of Copper Cliff suffered severely from an epidemic of typhoid. An examination of the water in many of the wells showed extremely high chlorine, and the worst of them were closed. Samples of the water were also sent to Toronto, to be tested at the laboratory of the Provincial Board of Health.

Owing, however, to the length of time that necessarily elapsed while the samples were in transit, the results returned were not very satisfactory.

It was felt that the only really satisfactory method was to test the water on the spot, and, during the winter of 1906-07, the Canadian Copper Company took the necessary steps to effect this, and, if possible, forestall a recurrence of the fever the following summer. With the assistance of Dr. Amyot, Provincial Bacteriologist, the necessary supplies and apparatus were purchased, and a competent man secured to carry out the tests. A room in the new laboratory was set apart especially for water analysis, and the systematic testing of the wells begun in May, 1907, with Mr. C. E. Rowland in charge.

In addition to the usual chemical tests for chlorine, free and albuminoid ammonia, a fairly complete bacteriological examination was also made, and indeed this proved much the more valuable. It is especially worthy of note that many of the wells that gave a low chlorine test proved really to be badly contaminated. This was undoubtedly due to infection from the pails used in dipping out the water, each one bringing his own pail and using it for that purpose. The remedy in this case was simple. The well was thoroughly cleaned, and provided with a bucket fixed at the well, or with a pump.

There were other wells, however, which showed high chlorine in conjunction with high bacteriological contents. These were evidently contaminated with sewerage and were closed. At others, which could only be called doubtful, notices were posted warning the users to boil the water for drinking purposes. The nature of the soil here makes it a very efficient filter, and, if a well were protected from surface contamination and sunk in a reasonably good place, the water obtained is excellent.

All glassware used in connection with the bacteriological tests was sterilized in a dry heat at about 150 degrees C. The sample, after being collected in a sterile, glass-stoppered bottle, was brought at once to the laboratory, and usually three tests made as follows:—

(1) A 1 C. C. portion was sown in agar-agar in a Petri dish, and left in a dark, moist place at the ordinary temperature, and afterwards the colonies were counted. Unless the count here were extremely high, water was never condemned on this test, as most of the bacteria growing at this temperature are quite harmless.

(2) Another 1 C. C. portion was also sown in agar-agar in a Petri dish, but incubated at 37 to 40 degrees C., and the colonies counted, using a Wolffheughl counting apparatus. Any growth at this temperature, which is approximately that of the body, was pretty certain to be dangerous, and, if obtained in addition to gas formation in (3), was considered sufficient evidence to condemn a well.

(3) A third 1 C. C. portion was introduced into a fermentation tube (a U tube with one closed arm) containing a meat broth and incubated at 37 degrees C. A gas formation in the closed arm, of which approximately 33 per cent. was CO₂ and the balance H₂, gave a practically certain proof of the presence of colon bacilli. Microscopic slides were made from the fermented liquid, and, under a high power microscope, the presence or absence of streptococci and staphylococci noted. Slides were also made from different colonies on the agar-agar, and the bacilli in these determined. Other slides were stained with the appropriate colors for examination under oil-immersion lens.

Ordinarily the above tests were sufficient, but many others were made, such as growths on litum-lactose-agar plates, cultures in agar tubes, etc., for further confirmation. Using a quantity of the water as large as 1 C. C. made the test a somewhat severe one, but, under the circumstances, it was better to err on the side of severity

than pass a water which might only have been termed doubtful if a smaller quantity had been used.

It is satisfactory to be able to record the fact that, owing to the measure taken, the town was practically free from typhoid during 1907. There were two or three cases only, and these of a comparatively mild type.

MINING IN THE KOOTENAYS, ETC.—A SUMMARY OF THE PAST YEAR'S WORK.

GEORGE A. OHREN.

The year which has just closed would have been a banner one for the Kootenays in the way of ore production had it not been for several drawbacks. In the early part of the year we had the transportation difficulties to deal with, then the trouble between employers and labor in the Crow's Nest Coal fields, car shortage, a hitch in the labor situation in the copper producing district, and what hurt most, the shortage of coke and fuel, which affected nearly all of the mining and smelting communities. However, taking the production and the business for the year it was a very good one for the mining industry here, and even with all the difficulties that cropped up, the total tonnage nearly came up to that of the year 1906. If things go at all smoothly during the year that now lies before us, we will be able to report a list of production and values that will beat anything that has been recorded heretofore. Of course this will depend to a greater or less extent on the values of copper, silver and lead strengthening a little above what they are at present, which is something we are all looking for.

In the Rossland district we can well say that things have taken a step forward; this applies more particularly to the operations of the Consolidated Mining & Smelting Company of Canada here. They have acquired a lot more territory, have done much development work on it, disclosing new ore bodies, have installed an up-to-date electrical and compressed air plant for mining and hoisting the ore, and to make a long story short have an excellently equipped and working property, with more ore in sight than they ever had before. This property is now down a depth of over 2,000 feet, and work is planned for still further depth.

At Le Roi mine they have not seen fit to add much more machinery to their already well furnished plant, and the principal improvements there during the past year have been in the way of development work, the cardinal part of which was the sinking of the main shaft from the 1,450 to the 2,000 foot levels and prospecting the ground between by drifts, winzes, diamond drill, etc. While the profits have not been enormous for the year's work, partly owing to the heavy expenditures for all this preparatory work, still the mine is looking well and there is ore enough in sight to keep the plant going for several years.

The Le Roi 2, Limited, has worked along steadily during the past twelve months mining and shipping some very fine copper ore and milling many tons of second-class ore. The company has by good management and rigid economy made money and can no doubt excel their record during 1908.

The Granby mines in the Boundary have acquired a lot more ground and have added materially to their ma-

chinery plant. They have increased their smelting capacity; have put in a couple more of the fifty-two ton crushers, etc.

The Consolidated Company at the Snowshoe mine have made great progress. They have opened up a lot of good shipping ore, which is of primary importance, have acquired an extensive group of mineral claims, and have added more air compressing machinery, electrical locomotives for underground haulage, etc.

The British Columbia Copper Company have also made many improvements about their property, have augmented their crushing plant by a monster crusher, are installing a new rope driven compressor, and have the mine working in fine condition with plenty of ore blocked out and development work well advanced.

The Dominion Copper Company installed two new compressors and more blast furnace capacity, besides other smaller additions, and are in a good position to make money during the coming year. It is anticipated that they will be in operation again in the next two or three months.

In the Slocan-Kootenay district the Consolidated Company's St. Eugene mine, the Sullivan, La Plata, Eva and other well known properties have all advanced in the way of improvements and now stand a step higher up the ladder than they did at this time a year ago.

Following are the ore shipments from Rossland for the calendar year ended December 31st, 1907, estimated:—

	Tons.
Centre Star mines	137,500
Le Roi	113,538
Le Roi 2, Limited	23,500
Le Roi 2, Limited (milled)	2,470
White Bear	2,729
White Bear (milled)	3,350
Others	253

283,340

From the Boundary:—

	Tons.
Granby	613,567
Mother Lode (B. C. Copper)	208,321
Snowshoe (Consolidated)	128,674
Rawhide (Dom. Copper Co.)	64,173
Brooklyn (Dom. Copper Co.)	44,101
Sunset (Dom. Copper Co.)	31,258
Emma (B. C. Copper)	18,274
Providence (high grade)	708
Others	39,259

Total 1,148,337

From Slocan-E. Kootenay:—

	Tons.
Sullivan	31,500
St. Eugene (Cons.)	23,067
La Plata	3,250
La Plata (milled)	20,000
Eva (milled)	6,500
North Star	2,889
Rambler, Cariboo	538
Ymir	305
Payne	55
Others	97,743
Total	185,857

Approximate smelter receipts were as follows:—

	Tons.
Trail smelter (Consolidated)	266,994
Northport smelter (Le Roi)	101,178
Granby, Grand Forks	628,001
B. C. Copper, Greenwood	326,295
Dominion Copper, Boundary Falls...	154,793
Hall M. & S. Co., Nelson	11,340
Marysville (Sullivan)	31,850

The Crow's Nest Pass Coal Company, the largest producer, mined:

	Tons.
Coal	982,735
Manufactured into coke	366,076
Exported to U. S.	327,100
Shipped to Canadian points	237,459
Sold locally	2,949

The Provincial output, taking it all around, showed an increase of \$4,636,625. Estimated value of the grand output is:

Gold, placer	\$ 700,000
Gold, lode	5,426,500
Silver	1,900,000
Lead	3,000,000
Zinc	125,000
Copper	9,874,000
Total metalliferous	\$21,025,500
Coal	6,490,000
Coke	1,135,000
Building material	1,200,000
Total production	\$29,850,500

Taking it all in all there is no complaint to make about the production from the British Columbia mines for 1907 and when it is all boiled down there is a balance on the credit side of nearly five million dollars, which goes to bear out what we have tried to indicate in the foregoing, that the mining industry has steadily marched forward during the past year and to-day occupies a much more prominent position than it did a year ago.

The year 1908 opens out in a most propitious manner for the mining industry and if the metal market will only pick up a little there is little doubt that the records on the 31st of December next will far exceed those mentioned above, for labor seems to be on a most amicable footing with the employer here, transportation facilities are in very good condition and the mines are in better position than they have been for a long time to make record breaking shipments.

TUBE MILLS.

The following article is interesting, not only to parties who are in some way connected with the construction or use of the special machines herein described, but also to students, or others, who have an interest in mechanism. The article proves that by changing the method of applying the power to drive such machine, an immense saving of power can be accomplished.

The accompanying cuts give an illustration of two rotary pulverizing cylinders, also called tube mills, or pebble mills. One of these cylinders is resting on journals in bearings (Fig. 1), extending from the heads of cylinder. The other cylinder, with its steel tires fastened around the same, rests on wheels (Fig. 2). Both cylinders are loaded up to the centre. The first, the gudgeon cylinder, is operated by a pinion on a counter-shaft driving a gear wheel. This gear is generally placed around the circumference of the head of the cylinder, and the motion transmitted by the pinion to the gear wheel rotates the cylinder around its axis, and thus in the cylinder of the style of Figure 1 the entire load has to be lifted about its axis in its operation. The other cylinder (Fig. 2) has no gear wheel around its head, and has no axis about which the load has to be lifted. The power to rotate the cylinder, as in Figure 2, is

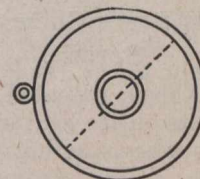
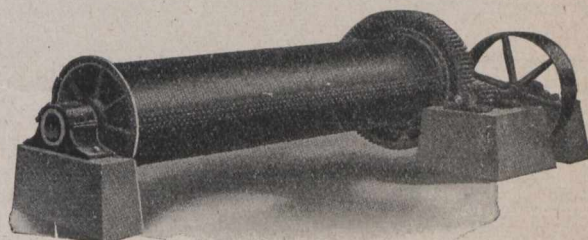


FIG. 1.

transmitted by rolling friction, by the aid of the centre driving wheels, on which the cylinder rests. The entire weight of the load and cylinder is balanced on the centre driving wheels, and when the motion is transmitted to rotate the cylinder, half of the load is balanced on the centre driving wheels, and consequently only one-half of the entire load must be lifted while the cylinder is in operation.

The inventor of this device, Mr. R. F. Abbe, president of the J. R. Alsing Engineering Company, of 136 Liberty street, New York, who handles his inventions, claims and intends to prove theoretically by the following explanation the amount of power that can be saved in driving such machine with his patented driving system, although it might be mentioned that practical demonstration has proven a higher percentage of saving in power than is proven theoretically.

The simplest explanation of how the saving of power is accomplished is the following:—

FOR A TUBE MILL AS STYLE SHOWN IN FIGURE 1, OLD STYLE.

A tube mill or pulverizing cylinder, say 5 feet in diameter by 22 feet long, has to carry a load of about 23500 pounds, consisting of flint pebbles and the material

to be ground. The centre of gravity of the load is 1.6 foot from the centre of the tube mill, and as the mill makes 25 revolutions per minutes, consequently we have $23500 \times 1.6 \times 25$, or 940000 foot pounds to lift about the gudgeon per minute.

There are 33000 foot pounds in one horse-power, hence $940000 \div 33000$ equals 28.485 horse-power plus the friction and weight of the entire cylinder, and load on bearings, which is equal to 21.845 horse-power, of which 10.495 horse-power is for friction and 11.350 horse-power for weight of cylinder.

half of the entire load is required to be lifted in this style of tube mill. Consequently it takes one-half of the 28.485 horse-power (which the other style of cylinder required for the same load), namely, 14.2425 horse-power. As the horse-power for friction and weight of cylinder is 18.4892, of which 7.1392 horse-power is for friction and 11.350 horse-power for weight of cylinder, then 14.2425 plus 18.4892 equals 32.7317 horse-power, which is required to operate a 5 foot x 22 foot tube mill with Mr. R. F. Abbe's patented system.

Therefore 50.330 minus 32.7317 horse-power equals

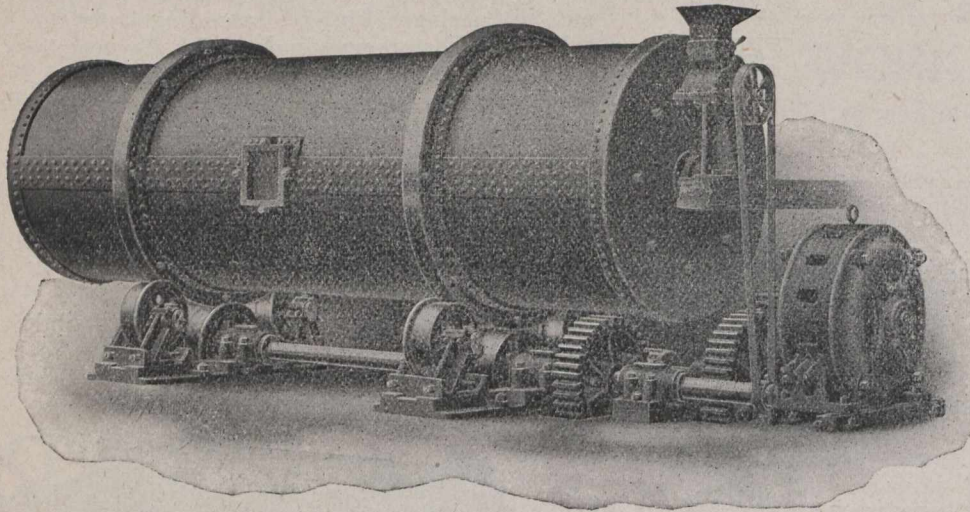
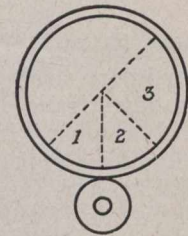


FIG. 2.



Thus 28.485 plus 21.845 equals 50.330 horse-power, which is required to operate a 5 foot x 22 foot tube mill running on gudgeons (Fig. 1).

FOR A TUBE MILL AS STYLE SHOWN IN FIGURE 2, NEW STYLE.

With Mr. R. F. Abbe's patented driving system the tube mill rests with its entire load on the centre driving wheels, the two side wheels acting only as guides. As illustrated by sketch in Fig. 2, one-half of the entire load is balanced (section 1 balances section 2), and carried by the centre driving wheels. Therefore only one-

17.5983 horse-power actually saved by the use of this patented system. This shows 35 per cent. of the horse-power saved.

In the above calculations the weight of the cylinders has been assumed to be equal in both style pulverizing cylinders, although by actual detailed estimation it has been shown that on account of the large gear wheel and heavy gudgeon heads used on the cylinder (Fig. 1) the same is heavier than the other cylinder (Fig. 2) by over 6,000 pounds, and thus this will increase the saving in power in the cylinder of Figure 2 (patented driving device).

BOOK REVIEWS.

THE ELECTRIC FURNACE—ITS EVOLUTION, THEORY AND PRACTICE. BY ALFRED STANSFIELD, D.Sc., PROFESSOR OF METALLURGY IN MCGILL UNIVERSITY. PUBLISHED BY "THE CANADIAN ENGINEER," TORONTO, 1907. PP. XI. + 211—9 BY 6. PRICE \$2.00.

"In this book," Dr. Stansfield's introduction tells us, "it has been the author's purpose to trace the evolution of the electric furnace from its simplest beginnings, and to set forth, as briefly as is consistent with clearness, the more important facts relating to its theory and practice."

In seven chapters, following each other logically and smoothly, Dr. Stansfield traces the history of electro-metallurgy, describes and classifies electric furnaces, compares their efficiency with that of other fuel furnaces, goes briefly and completely into matters of construction, design and operation, dwells upon the uses of electric

furnace products and concludes with a chapter on future possibilities.

The book is well written. It can be intelligently read by secondary students. It is thoughtfully put together and amply illustrated. After reviewing the present sources of electrical power, Dr. Stansfield concludes by alluding to Lord Kelvin's suggestion that the ether may be a future source of limitless supplies of power. "We can," adds the author, "await with quiet minds the exhaustion of the coal supplies of the world."

A text book upon the electric furnace has been needed. The ordinary reader can derive but little benefit from special reports. Hence even a general knowledge of modern electro-metallurgy is rare. Dr. Stansfield has succeeded in presenting in compact form a crisp, understandable treatise on a subject of growing importance. His book is a well-digested summary of the latest and best literature.

MINING TABLES—BEING A COMPARISON OF THE UNITS OF WEIGHT, MEASURE, CURRENCY, MINING AREA, ETC., OF DIFFERENT COUNTRIES; TOGETHER WITH TABLES, CONSTANTS AND OTHER DATA USEFUL TO MINING ENGINEERS AND SURVEYORS—BY F. H. HATCH, PH.D., F.G.S., AND E. J. VALLENTINE, F.G.S. MACMILLAN COMPANY OF CANADA, LIMITED, TORONTO. PP. 200—8 1-2 x 5 1-2. PRICE \$1.75.

The usefulness of this book will be at once recognized. In it are collected and arranged the tables of weights and measures used by the principal nations of the world. Definitions of units of force and energy are given. Amongst other most useful (but usually unfindable) information are tables of conversion of British, Metric and Russian units.

In Part V., under the heading "Data Specially Relating to Mining," are to be found tables of much more than usual value. In these both the long and the short ton are used. The tables giving ore tonnage per unit area for veins or beds one foot thick and of unit density for each degree of dip from 0 degrees to 85 degrees, are the outstanding feature of this chapter.

Section V. of Part V. defines briefly the unit mining area of different countries. The Transvaal Claim for vein and reef mining has an area of 60,000 square Cape feet. It is usually rectangular in form and measures 150 Cape feet along the strike by 400 Cape feet in a direction at right angles to the strike. The Cape foot, incidentally, is equivalent to 1.033 English feet.

Similar data are given for many other countries, including Canada. The fact that Alberta and Saskatchewan have been erected into provinces has, apparently, been overlooked.

Data relating to measurement of the flow of water, storage of water, flow in pipes, air, steam, along with trigonometrical and other formulae, surveying data, tachometric tables, tables of chords, etc., etc., help to complete this well-compiled volume.

JOURNEYS OF OBSERVATION—BY T. A. RICKARD. PUBLISHED BY THE "MINING AND SCIENTIFIC PRESS," 667 HOWARD ST., SAN FRANCISCO. PP. 500. CLOTH, \$3.50. AUTHOR'S EDITION, \$5.00.

Although we had previously read most of the delightful letters that together make up the volume, it was a light and pleasant task to read them again.

The author, in his preface, remarks that "this book records the observations made by a traveller who happened to be a mining engineer." To this we may add that Mr. Rickard has the good fortune to be a mining engineer with a mind cultivated by experience, wide reading and sympathetic observation. He is, moreover, a master of the English language.

As befits a sound and honest observer, Mr. Rickard clothes his thoughts in simple, straightforward words. He is no stylist. His sentences are clean-cut. His paragraphs are well constructed. His diction is simple.

Two hundred and fifty pages of the volume are taken up with the record of a journey from New York to Mexico, together with a description of the mining industry of El Oro, Pachuca and Guanajuato. The Span-

ish Conquest, Vein Formation, Tube Mills, Meteorites, Cortez, the Great Shafts of the Veta Madre, How to Sample, are a few of the diversified topics touched upon and woven into a charming and coherent whole.

The non-technical reader can follow the whole narrative and carry away a clear impression of Mexican mining. The mining engineer can read it with the same amount of pleasure and a super-added sense of profit; for the mining and milling practice of the districts mentioned above is lucidly and adequately described.

It is this unusual combination of scientific accuracy and truly artistic literary skill that makes Mr. Rickard's writings what they are.

We know of no other volume that will give the reader so vivid and so exact a picture of Mexico.

The second part of the book is an account of a ride over the mountainous mining regions of Southeastern Colorado.

Although, like the preceding narrative, it contains a startling variety of subjects, yet there is no confusion. We find ourselves quite as deeply interested in the secondary enrichment of copper veins as in the assassination of brave Arthur Collins.

For the "peckish" reader the volume is plentifully spiced with anecdotes and varied by excursions into history and the realm of human nature. For the student there is an ample supply of scientific pabulum, served rarely well.

We would that space allowed us to quote extensively from any or all of the chapters. But we must be content with one excerpt.

Descending the mountains on their way to Ouray, Mr. Rickard's party came suddenly into full view of the Uncompahgre valley. A storm had just passed. Mr. Rickard describes the scene: "The storm had swept northward, the sky was still partly overcast with flying cloud, a luminous atmosphere, pure as interplanetary space, filled the canyon depths, and from the west the sunlight pierced the lingering mists with mellow light Across the canyon the terraced slopes descended in parklike gradation, resplendent with their livery of autumn, and above their aspen gold the bastions of blue-gray andesite rose tier after tier in Gothic severity of line until belted with the rising mists." A few pages before these lines occur, we came upon an analysis of anthracite coal. Yet there is continuity and sustained interest in every chapter of the book.

Antimony pigments are being favored by the French and Italian Governments. The advantage is claimed over white lead in being non-poisonous and over zinc paint in being permanent and sun-proof.

Tellurium is a practically useless metal. At little is used in medicine, but it is stated that a day's yield of a single copper refinery would stock a large chemical supply house for a year's trade.

Uranyl molybdate, the remarkable new radioactive substance of Andre Lancien, a French student of pharmacy, is prepared by adding ammonium molybdate to uranyl nitrate, when a white amorphous powder separates. This powder is collected and dried in the dark. It is claimed to be as powerfully radioactive as radium bromide, and to have substantially the same effects, while its cost—though high, at \$110 an ounce—is low compared with the radium salt at thousands of dollars an ounce.

TRAGEDY IN DIAMONDS.

ALEXANDER GRAY.

The casual reader of daily papers has doubtless dismissed as unimportant the brief cable to the effect that the police of Paris are seeking a humbug named Le Moyne, who fleeced Julius Wernher out of a third of a million dollars. Not knowing the ramifications of the victim of this swindle, the laity not recognizing in the name the chief of Messrs. Wernher, Beit & Company, probably the greatest mining firm in London, the mere fact that a glib-tongued sleight of hand magician had dexterously substituted a genuine diamond for something or other alleged to be of manufactured excellence equaling the real, has been dismissed without other than casual consideration.

Since the principal who parted with 1,600,000 francs is Sir Julius Wernher, Bart., a director of De Beers Consolidated, chairman of Fraser & Chalmers, Limited, the central figure of Witwatersrand mining, and one of the very best types of mining magnates, the incident becomes doubly interesting, in that it rather confirms the expectation among savants that diamonds will, sooner or later, be manufactured economically, perfectly, in quantities and qualities. Not only is Sir Julius Wernher a leading personality; he is a chief factor in the diamond trade, and to his firm is allotted almost 40 per cent. of the profits accruing to the diamond syndicate regulating the output of South African diamonds. How he was bamboozled by Le Moyne may not be revealed, although the publicity given the transaction evidences the determination of Sir Julius to expose the alleged necromancer; but the anxiety of so well informed a mining master to be a party to even the faked discovery will be consolatory to those who were "gold bricked" by Highland Mary promoters, to these who are finding out that tarradiddling is not confined to Ontario flotations.

With Sir Julius the incentive to protect his market is self-evident, more especially in view of the precarious state of the diamond trade. De Beers mines are working half time when they could put out in a twelve-month diamonds valued at \$40,000,000 to \$50,000,000. The Diamond Syndicate has refused to sell rough diamonds,

that is uncut stones, for two months, to enable dealers to get rid of what they have in stock. Banks will not advance as freely against precious stones as security, a security, by the way, which has been safe as gilt-edged paper. Importations to America in December fell off to the extent of \$4,000,000, as compared with the same month in 1906. Diamonds carried by dealers mount into the millions. The purchasing power of the public being distraught, impairment of capital is a distressing item in households, and to those in the trade. America has been the best of the De Beers clients, but it took \$11,860,443 less in diamonds in 1907 than it did the year previous. If Le Moyne had convinced Sir Julius Wernher and his colleagues that he could chemically create diamonds, the New York panic would be a trivial affair in comparison to what would happen in the jewellery trade. As it is, De Beers shares are selling at half their price of a year ago, and strenuous efforts are being made to maintain the market value of the stone. The output of the Premier mine is bringing about 50 per cent. of what it was valued at two years ago by the chairman of that phenomenal company. Roberts Victor mine shares are 700 per cent. lower than they were. To have Le Moyne appear with a lustrous stone, apparently produced in his laboratory, in view of all this, was justification for Sir Julius advancing a tidy amount on account. When Sir Julius asked for a further demonstration, Le Moyne is said to have betaken himself to less troublesome quarters.

It was explained in THE CANADIAN MINING JOURNAL a while back that the De Beers Mines have a century's supply of diamonds awaiting extraction. The Premier Company have extraordinary possibilities as an individual proposition. Should Parisian chemists achieve with the diamond what they have with chemically produced sapphires and rubies, gems now ranging from \$100 to \$1,000 per carat, would be as plentiful as beads. The element of rarity and purity present in the diamond when attained—if attained—is what induced Sir Julius Wernher to take the risk in the belief he had found the pot of gold at the end of the rainbow.

The diamond is serene. Sir Julius may not be—but it might have been worse—for De Beers shareholders and the Nouveaux riches.

EXCHANGES.

The *Engineering and Mining Journal*, January 18th.—A special correspondent describes in this number of our contemporary "Slate Mining in Wales and Cause of its Decline." Decrease of building activity, foreign tariffs, and the keen competition of French producers have combined to paralyze the English slate mining industry. The great Penrhyn strike, which removed a monthly output of 10,000 tons from the market caused other Welsh producers to put up prices. A reaction set in and consumers began to look abroad for supplies. French slates, from the district of Angers on the Loire, found favor and have kept hold of the market.

The slate-producing districts of Wales are "bleak, chilly and damp places to live in."

The same is true of the Cornwall districts.

The new law making English employers responsible for all accidents and illnesses contracted by employees in the course of their duties has brought about intolerable conditions in the slate mines.

The slate mining of Wales is centred at the Penrhyn and Dinorwic quarries, where the work is open cut, and at Festiniog, where most of the slate is won from underground. There are also many smaller quarries, either worked on a small scale or abandoned.

The Oakley mine is by far the most important of the Festiniog group. The management is modern and progressive and the equipment is excellent. The yard is situated in the town of Blaenan Festiniog and is about 900 feet above sea level. The mine buildings and dressing houses are at the top of an incline 500 feet higher. The slate veins dip to the north at about 30 degrees from the horizontal. They are worked entirely in underground chambers, in a series of horizontal floors about 60 feet apart.

On each floor there are a number of chambers from 50 to 70 feet wide, separated by walls about 40 feet wide left in the slate. The chambers from one floor to another are usually continuous. The various chambers and

floors are connected by tunnels through the walls and by means of adits and tunnels outside. There are altogether 26 floors. The vertical depth between the top and bottom is 1,430 feet. There are five veins running from a minimum of 30 feet in thickness to 300 feet. They are all worked. The normal output is 4,000 tons of slates per month. About 1,600 men are employed.

The plant for hauling and pumping is modern. Electrical power is used. Current is obtained from a water power generated from the waters of a lake on the side of Snowdon. It is brought eight miles over the hills at 10,000 volts.

The manufacture of slates and slabs is as usual. Suitable pieces are sent to the slab-house, where they are sawn to shape and planed smooth. Everything except the splitting is done by machinery driven by electric motors.

Mining Science, January 16th.—Under the title "The Wisconsin Mining Trade School," R. B. Brinsmade outlines the courses and aim of a new institution at Platteville. The Wisconsin State Legislature is opening the doors of a new institution for secondary mining education. The minimum age limit is set at 15 1-2 years, and the course is only 2 years. The entrance requirements are mainly a knowledge of arithmetic and the use of the English language. Tuition is free and by a co-operative arrangement board and lodging may be obtained at the rate of \$3 per week. The expenses of laboratory materials and books are kept low. It is possible for a student to get through a school year on an outlay of \$170. Recognizing that mining is not only an art, but a science also, the marked traits of practical self-trained engineers, "curiosity, clear-sightedness, and ingenuity," will be cultivated in students. In addition they will be given an efficient knowledge of mathematics and of the formulated laws of natural science. The course of instruction will be a just compromise between the formal scholastic training and the practical "shop" apprenticeship. "The attempt will be made not to develop consulting engineers, but rather the executive man of action in a scientific occupation."

The subjects taught will include algebra, geometry and trigonometry; chemistry, physics, mineralogy and geology; shop work, drafting, surveying, mining machinery and metal—and coal—mining. The two years' course will cover 80 weeks and there will be extra summer work. The school year will begin in January in order to include two summers. Two months each summer will be spent in underground work—one summer in metal mining and one in coal mining.

No mining theory will be taught the students until after the first summer's underground experience. A shaft will be started on the school campus, as a large body of zinc ore has been proved to exist there.

Laboratory instructing will be given in drilling.

Trans. of the Mining Institute of Scotland, Vol. xxx., Part I.—This pamphlet contains an abstract by James Bain of the report on Rescue Apparatus of a committee appointed by the Fife and Clackmannan Coal-owners' Association. That committee adopted the following conclusions:—(1) That a central station, equipped with a certain number of sets (say, twenty) of apparatus ready for use in case of emergency, is necessary for

Fife, and that it should be in telephonic communication with every colliery. (2) That a certain number of sets of apparatus (say, not less than five) should be kept ready at every colliery. (3) That at every colliery at least twenty men, including all the officials who know the mine, should be instructed in the construction and use of the apparatus. (4) That an intelligent man should have care of the central station, and be capable of instructing the men in the use of the apparatus and keeping the apparatus in order. (5) That the apparatus designed by Mr. Garforth is the best suited for our mines, being lighter, smaller, and more flexible than any other inspected by the committee.

Developing each recommendation further, the committee estimates the cost of a central station, and experimental gallery, to be about £1,200, exclusive of apparatus, and that it would take from £250 to £300 per annum for upkeep. Each rescue party should consist of five persons, one to have charge of the other four, whose only duty would be to direct the operations. The committee further dwells upon a serious defect in all apparatus. Not one type provides for means of communication between the men forming the rescue party, except by signals.

PERSONAL AND GENERAL

Mr. Eugene Coste has returned from a visit to Ottawa and Montreal.

Mr. H. E. T. Haultain left Toronto on the 20th January for Craigmont.

Mr. J. J. Harpell has returned from a visit to Montreal, Ottawa and Kingston.

Mr. R. Anson-Cartwright has returned to Toronto after visiting Great Britain.

The Deputy Minister of Mines for Nova Scotia, Mr. Hiram Donkin, has been appointed Commissioner of Roads for the Province.

The task of presenting the petition for an extension of the bounty upon lead has been entrusted to Messrs. J. L. Retallaek and L. Pratt.

Mr. S. H. Reynolds, C.E., assistant city engineer of Winnipeg, will remove to Victoria, B.C., and devote himself to mining engineering.

Mr. Howells Frechette, late of the Crow's Nest Pass Coal Company, passed through Toronto on the 20th of January on his way to Ottawa.

Mr. W. A. Carlyle, recently of the Rio Tinto, and now consulting engineer to Le Roi, passed through Toronto on his way to British Columbia on January 24th.

Mr. J. H. Plummer, president of the Dominion Iron and Steel Company, sailed recently from New York for England. He will be absent for about six months.

Mr. E. A. C. Pew, a prominent railroad and mining promoter, died in Toronto on January 16th, aged 73 years. He was largely interested in the iron mining industry.

Mr. E. J. Laschinger, M.E., B.A.Sc., formerly of Toronto, read a paper on the "Flow of Compressed Air in Pipes" before the Transvaal Institute of Mechanical Engineers, Johannesburg, on December 14th.

Mr. Anthony Blum, president of the Laurentian gold mine, Manitou Lake district, Ontario, visited the property recently, returning with a gold brick valued at about \$6,000, the results of a month's clean-up. The name of the company has been changed to the Imperial.

Mr. H. Mortimer-Lamb, Secretary of the Canadian Mining Institute, visited Toronto early in January. Mr. Lamb has had several interviews with the Provincial and Federal Governments recently concerning the expected summer visit of the British Iron and Steel Institute.

Mr. R. H. Stewart, manager of the mines of the Consolidated Mining & Smelting Company, was married on December 26th to Miss A. A. Will, of Toronto. Mr. Stewart is a graduate of McGill, Mrs. Stewart a graduate of Victoria. The wedding took place in Victoria Chapel.

On Wednesday, January 15th, a Western Branch of the Canadian Mining Institute was organized in Nelson, B.C. Mr. Frederick Keffer, of Greenwood, who is president of the parent society, occupied the chair, and Mr. A. H. Gracey, of the Eva mine, acted as secretary. In all twenty-four members were present. There were also present others who will be added to the membership in due course. After Mr. Keffer had briefly outlined the objects of the new branch, a formal motion was made by Mr. S. S. Fowler, seconded by Mr. C. P. Hill, that "we now constitute ourselves a Western branch of the Canadian Mining Institute." This was carried unanimously. The following officers were then elected:—President, Mr. A. B. Hodges; secretary, Mr. E. Jacobs; executive council, Messrs. P. S. Couldrey, R. H. Stewart, L. Hill, O. E. S. Whiteside, W. M. Brewer, J. C. Haas, E. C. Musgrave, J. McEvoy and S. G. Blaylock.

President Hodges in his opening address stated that the whole reason for the formation of the Western branch is that the busy members of the West cannot attend the meetings of the Institute held in the East. He recommended that a committee of three be appointed to look into the by-laws of the Canadian Mining Institute. Accordingly, Messrs. S. S. Fowler, L. Hill and J. C. Haas were appointed and instructed to report on the morrow. Mr. E. Jacobs, editor of the "B. C. Mining Record," thanked the members for electing him to the position of secretary. He added that the Western branch had now almost 150 members, and that it would shortly attain a membership of 200.

Mr. Jacobs then remarked: "In view of the fact that the Department of Mines is now organized, it would be politic for us to draft a resolution congratulating the Dominion Government upon its establishment and expressing appreciation of the useful work done in the West by the Geological Survey and, as well, with reference to the statistics gathered by R. R. Hedley throughout the province." Mr. Jacobs also called attention to the fact that it had been said that the Canadian mint could not use Canadian metal for its work, inasmuch as there was no refinery for certain metals within the Dominion. This was not the case, inasmuch as there was such a refinery at Trail. This matter should be taken up by the Institute.

The secretary was instructed to prepare a resolution along these lines.

The meeting then adjourned.

Mr. S. S. Fowler, on behalf of the Nelson members, tendered an invitation to the members to be present at a dance in the Hume Hotel.

Mr. Frank B. Smith has been commissioned as Inspector of Mines for the Dominion to look after the royalties on coal lands sold in Saskatchewan and Alberta.

CORRESPONDENCE.

WESTERN BRANCH OF THE CANADIAN MINING INSTITUTE.

Victoria, B.C.,

The Editor,

January 18th, 1908.

CANADIAN MINING JOURNAL.

Dear Sir,—Accompanying this I send you an account of the first meeting of members of this branch of the Canadian Mining Institute. Although the attendance was not as large as had been hoped for, it was considered good by those who made the arrangements for the meeting, having been representative of the chief lode—and coal—mining sections of British Columbia to a degree regarded as satisfactory, especially when it was taken into account the long distances most members reside from a convenient central point, and the difficulty busy officials usually experience in leaving their posts for four or five days at a time. Interest in the proceedings was general among members present, and was well maintained throughout the several sessions held. It is known that one immediate result was the nomination for membership in the Institute of at least a dozen other men actively associated with mining or smelting in the Northwest, while there was expressed by the leading members of the branch a determination to increase the total number of Western members of the Institute—now about 125—to fully 200 within a few months. With so comparatively numerous a membership, and the fact that it is both influential and representative, together with the active following up of the movement so successfully inaugurated at Nelson on the 15th inst., there does not seem to be room for doubt that eventually this auxiliary organization, launched under distinctly auspicious circumstances, will prove materially beneficial to the mining and smelting industries of Western Canada, and, it is hoped, in some measure also of those of adjacent parts. Your valuable co-operation is therefore earnestly invited.

Thanking you in advance, I am

Yours very truly,

E. JACOBS,

Secretary of Western Branch.

One of the unnecessary burdens under which English companies, operating Canadian mines, have almost always suffered is that of costly administration. In the annual report of Le Roi Mining Company, Limited, we notice that a clerical staff is maintained in London, Eng., at an annual cost of \$10,000. This is a wasteful duplication. Almost all necessary clerical work can be and should be done at the mine. The company's affairs in England might easily be handled at one-quarter of this outlay.

SPECIAL CORRESPONDENCE

ONTARIO.

COBALT.

Rochester, Cobalt.—Active work on this property will be resumed at once.

Provincial.—Twenty-five men are employed. A station is being out at the 125 foot level.

Badger.—There are two shifts working here with three drills. Sinking on the No. 2 vein is being carried on.

Amalgamated Cobalt.—Work has been resumed on the lot of this company, adjoining the Trethewey on the west.

Nova Scotia.—Fifty-five men are employed. A car of very high grade ore has been shipped this month. No 2 shaft is now down 110 feet.

Cobalt Merchants' Mining & Milling Company.—At the annual meeting held in Toronto on Saturday, 18th inst., it was decided to wind up the affairs of the company.

Silver Queen.—There are nearly four cars of high grade ore ready for shipment. Work is still going on with the diamond drill. Twenty-five men are employed.

Cobalt Lake.—The big niccolite vein which was cut at 87 feet is now showing good silver values. At the surface this vein was practically solid niccolite, at 87 feet it is cobalt, niccolite and silver.

Northland Mine, Rib Lake (Harris Mine).—Forty men are at work here, and about two cars of ore per day are being shipped. Sinking will be resumed as soon as the new twelve drill compressor is installed.

Temiskaming & Hudson Bay.—The last two cars of ore from here were shipped to Copper Cliff. They brought \$70,000, or an average of about \$1,000 per ton. The cross cut being run north to the big cobalt vein has cut two small seams of smaltite. The cut is now in 125 feet.

Hudson Bay Extended.—On Saturday, 18th January, it was decided at the shareholders' meeting of this company to exchange the outstanding stock for that in the Cleveland Cobalt, on a basis of one share of H. B. Extended for six shares of Cleveland Cobalt. This will entail an exchange of 300,000 shares in the Cleveland Cobalt.

City of Cobalt.—The shaft on the City of Cobalt Mine is now down 145 feet. The vein, which was one and a half inches wide at the surface, was two and a half inches at 60 feet, and is now from 4 to 5 inches wide at the bottom of the shaft and averages 3,500 to 4,000 ounces silver to the ton. In sinking the 61 feet from the 80 foot level to the bottom 23,000 pounds of No. 1 selected ore, 33,000 pounds of cobbings and 70,000 pounds of screenings were produced. The No. 1 averages 3,500 ounces of silver to the ton, the cobbings 550 ounces, and the screenings over 275 ounces. It is estimated that close to 60,000 ounces of silver have been produced in 61 feet of sinking.

Cobalt Central.—The concentrating mill here is giving very satisfactory results. The mill report for one day in January shows: Tonnage crushed, 50 tons; mill heads, 71.1 ounces; mill tails, 4.6 ounces; extraction, 83.6 per cent.; jig concentrates produced, 315 pounds; table concentrates produced, 291 pounds; ounces silver recovered, 3,355; market value, \$1,845.25. The mill is recovering 93 per cent. of the metal values.

The order constituting the Townships of Coleman, Bucke, Lorrain and Hudson "complete inspection areas" has been repealed so far as Coleman is concerned by Order-in-Council. The effect is that Section 68, Mines Act, 1906, no longer applies to Coleman Township, and inspection of claims is no longer required to obtain

patents. Sixty days after recording, a certificate of record is issued, and after the work is done a patent is issued. (Section 160 (3) Mines Act, 1906). A licensee who has staked out a claim under the provisions of this Act shall, during each of the three years following the expiration of the three months from the record by or on behalf of such licensee of the staking thereof, perform thereon work, as in the first sub-section hereof, provided as follows:—

(a) During each of the first and second of such three years to the extent of not less than eight hours per day for sixty days.

(b) During the third of such three years' work thereon to the extent of not less than eight hours per day for ninety days.

The shipments from the Cobalt camp for the week ending January 11th were the largest so far for any one week in the history of the camp.

	Lbs.
Coniagas	77,020
Nipissing	131,730
La Rose	85,400
Nova Scotia	40,790

There were 39 companies organized in the eighteen months ending January 1, 1908, with a capital of \$38,740,000, to do business in the Northern Ontario mining field.

COPPER CLIFF.

At both the Creighton and Crean Hill mines of the Canadian Copper Company new rock houses are being built. Each rock house has a capacity of 1,500 tons per day. The old rock house at the Creighton has been remodelled and rebuilt. At both mines new electric hoists have been installed, along with electric driven air compressors and pumps. The new engine houses, warehouses and shop buildings are all of fireproof construction.

During the past year an average of 1,000 tons of ore was mined. At the smelter three furnaces were operated all the year except during December, when only two were in blast. Two new furnaces have been purchased and delivered. They will be erected next summer. During the past year a new ten-stand converting plant of the best and most modern type was erected. A new six-stall round house has been added to the plant, and the foundations of new warehouses and shops have been started.

ALBERTA.

FRANK.

The Lille and Bellevue mines are also suffering from bad trade, about 250 miners being affected at these mines.

The Hillcrest mines at Hillcrest, near Frank, are in operation as they have a contract with the C. P. R. for the total output of the mines, and have an arrangement whereby they are allowed to dump the coal on the railway company dump if cars cannot be had. The International Coal & Coke Company of Coleman have a contract with the C. P. R. for a large part of the output and this company's mines are running full time.

Owing to the contract between the Canadian Pacific Railway Company and the Canadian-American Coal & Coke Company of Frank having run out about 250 men are out of employment. Mr. S. Moore, the general manager of the Canadian-American Coal & Coke Company, has asked an advance in price from the C. P. R., and the latter company decline to renew their contract for 800 tons per day unless at the old price. The C. P. R. claim that they are blocked up with coal in all their dumps.

TABER.

The mines round Taber are working very short time, owing to dullness in the coal trade. This has been an exceedingly mild winter, and as the Taber coal is only used for domestic purposes, the demand has not come up to expectations.

The following advertisement appeared in a recent issue of the *Fernie Ledger*:—

"WANTED."

"Employment for 938 miners, mine laborers, drivers, timbermen, hoistmen and engineers, now idle, warranted to be first-class wage slaves.

"Apply F. H. Sherman, Pres. U. M. W. of A., Box 145, Taber, Alta."

F. H. Sherman, president of District 18, United Mineworkers of America, has been in the Edmonton district during the past week settling some labor troubles at the mines. He has now gone to Indianapolis to attend the general convention of the United Mineworkers of America which is being held. The chief item of interest at the convention is the election of a new president to succeed John Mitchell, who has been in poor health for some time past.

It is generally understood that T. H. Lewis will be the member selected to fill the office of president on the retirement of John Mitchell.

EDMONTON.

As a result of a conference between representatives of the miners and mine owners of the Edmonton district a new wage scale has been agreed upon. The new scale was drawn up after a lengthy conference between T. B. Smith, representing the mine owners, and F. H. Sherman, of Taber, president of Dist. 18 U. M. W. of A. Dr. McNabb, of Lethbridge, representing the Lethbridge district, E. A. James, of Edmonton, local organizer of the northern district, and Chas. Richardson, president of the local union, all of whom represented the miners.

BRITISH COLUMBIA.

THE KOOTENAYS.

Work at the Granby mines and smelter in the Boundary district is now well under way. At the first of the year but two of the entire battery of eight furnaces at the smelter were operating, and only 250 of the regular force of about 550 men had been put to work at the mines. The output has been gradually increased, and more men put back to work until at this writing nearly 450 men are working at the mines and six of the big furnaces are treating ore. During the week ended January 11th the Granby shipped 12,887 tons of ore and treated at the smelter 15,695 tons. These figures should be much higher for the present week, as the output is being steadily increased. It is the intention of the management to increase the force until the smelter is running at its full capacity of 3,500 tons of ore per day, which will of course necessitate the mines turning out the greater part of this. If it is possible to keep this output up well into the middle of the summer and the affairs of the company look propitious, they will increase the capacity of the smelting plant to a treating capacity of 4,500 tons per day; at least, that is the intention now. The Granby Company's freight bill with the C. P. R. and G. N. R. when running at full capacity, amounts to about \$30,000 per month. The British Columbia Copper Company pays the C. P. R. about \$10,000 per month.

The British Columbia Copper, Snowshoe or Dominion Copper Company's mines have not made a move to resume work as yet, but it is expected that the coming month will see some developments at those properties. The Dominion Copper Company will hold their annual meeting at Phoenix on the 27th inst., when it is expected that something definite will be done.

With copper selling at its present low price, the Boundary mining companies will have to exercise great economy and good management if the shareholders are to get any dividends. During their last fiscal year it cost the Granby Company 10.13 cents to mine, smelt, refine and sell its copper. British Columbia Copper Company figures ran 12 cents to 12 1-2 cents as cost of mining, smelting, refining and selling its copper product. Dominion Copper Company produced copper at around 10 1-2 cents per pound, f.o.b. its smelter, but during the year ended July 31st last, owing to many drawbacks, it cost them approximately 14 cents.

The labor situation in the Boundary is in a fairly settled condition. There are a number of the men going around with a chip on their shoulder and grumbling at anything and everything, but the majority are not paying much attention to them and are glad to be back at work and doing their little share to tide matters over the present situation by working at a slightly lowered wage. There are two or three men for every position though, having hurried from all points of the compass when they heard that work was to be started up in the Boundary.

The Rossland mines are working a good force of men and good and busy. The Centre Star is shipping 3,700 to 3,800 tons of ore per week, Le Roi from 1,700 to 2,000 tons, Le Roi 2, Limited, about 600 tons.

The Le Roi 2, Limited, Company intends to mine and ship on a larger scale next summer. Considerable development work has been done lately looking towards this, and the showings seem to warrant the expenditure which will be necessary. The Le Roi 2 has always been a money-maker and dividend-payer, and interested people here will be pleased to see that they are planning for operation on a greater scale.

The Rossland Board of Trade is taking a keen interest in the extension of the lead bounty for another five years, and the raising of the limit when the bounty should be paid from \$16 to \$18. It is noted that the two and a half millions appropriated by the Government for the lead bounty, at the rate of \$50,000 per year, only \$616,976.02 has been paid to the lead producers. Still, there is no doubt that this bounty has been a wonderful stimulus to the silver-lead mines. This can be easily seen by the increased activity among the smaller silver-lead producers in the Slovan and East Kootenay during the period of its existence. Many of these lesser properties have been worked, developed and have made small shipments that would probably have lain idle had it not been for the bounty.

Residents of this locality take more or less pride from the fact that we are in a position to furnish the new Canadian mint with fine silver and gold for coinage purposes. The Consolidated smelter and refinery at Trail is one of the most up-to-date and complete plants in the country and is in a position to furnish more fine gold and silver than the mint can at present use. The material in the new coins will therefore be mined, smelted, refined and coined in Canada.

Many holders of stock in the East will be pleased to learn that they have made a valuable strike in the shaft at the 500 foot level of the Stemwinder mine. This makes the proposition look a whole lot better. Plans for energetic development work in the future are now being laid out.

The Diamond Vale Coal Company in Nicola valley have finally struck a six foot seam of coal on their property. As near as can be ascertained from the workings in the Valley Coal & Coke Company a very rich seam of fine coal exists 120 feet below the one struck. It is the intention of the Diamond Vale people to sink to this rich seam.

It is expected that the plant of the Nelson Electric Smelting Company for the handling of zinc ore will be in operation in the latter part of March or early in April. The Hewitt Mining Company in the Slovan are working actively and have drawn up plans

for another tramway, which will enable them to handle the product of the mine more economically.

Mr. M. S. Davys, of Nelson, and others, are negotiating for a lease on the Silver King mine at Nelson. The deal has not been put through yet.

The Vancouver mine, controlled by Le Roi 2, Limited, Rossland, and the Eureka (Consolidated) are working right along and are improving with every round fired.

The operators of the Krao mine find it a very expensive proposition to work their property with the present workings on account of the water they have to contend with. A 4,000 foot tunnel is planned, something similar to that driven a while ago by the Rambler-Cariboo, to overcome this difficulty.

A strike of good steel galena has been made on the Aurora property opposite Moyie. This property is supposed to be on the St. Eugene lead, as well as the submarine workings of the Cam-

brian people, in the centre of Moyie Lake. It does seem that where there is such a magnificent showing as the St. Eugene has there should be other valuable mines.

The Perry Creek Hydraulic mine near Cranbrook has been sold to the Illinois Steel Company of Chicago for \$900,000, the original owners retaining \$100,000 interest in the mine.

Mr. D. C. Corbin, the Spokane capitalist, who controls nearly 10,000 acres of coal lands on the Crow's Nest, is putting plans into operation to tap them with a railway and work the measures. This will give the Crow's Nest district another producing coal property.

The coal mines of the Crow's Nest, International and Royal Companies are being operated daily. The properties of the Canadian-American Coal & Coke Company at Frank and those of the West Canadian Collieries at Lille have suspended work temporarily.

GENERAL MINING NEWS

NOVA SCOTIA.

HALIFAX.—The Hon. Robert Drummond, editor of the *Maritime Mining Record*, writes strongly on the decision of the Supreme Court of Nova Scotia in the Coal-Steel case. The vital clause 3 is taken as the text for a remarkably frank editorial, in which Mr. Drummond states that the specifications were here incorporated by the Coal Company for the express purpose of preventing the Steel Company from securing coal at \$1.28 for any other than the direct needs of manufacturing iron and steel. The decision of the court is traversed point by point. Strong allusion is made to the fact that for every ton of cheap coal obtained by the Steel Company, the public must suffer by paying an enhanced price for domestic coal.

SPRINGHILL.—Manager Cowans of the Cumberland Coal & Railway Company, Springhill, has refused to meet the Conciliation Board or the representatives of the workmen. Mr. Cowans claims that there is nothing to arbitrate. However, the Board is meeting and has taken evidence in the "stone" question.

ANTIGONISH.—Hugh Fletcher, of the Geological Survey of Canada, is investigating the recently discovered coal deposits at Big Marsh. Diamond drills are being used. Deputy Inspector of Mines Blackwood is associated with Mr. Fletcher.

WESTVILLE.—The fire clay and firebrick plant of the Drummond Colliery had a prosperous year in 1907. Their market is largely in Sydney and Sydney Mines with the two steel companies. For ladle linings their product is unsurpassed.

The Drummond colliery exceeded all previous annual records.

SYDNEY.—The Dominion Iron & Steel Company is reported to have struck a large seam of coal on the Cowan's areas. Thirty men are working on these areas.

ONTARIO.

OTTAWA.—The Railway Committee of the House of Commons discussed the building of a branch of the British Yukon Railway Company to the valuable copper deposits of the Takhiena River district. The branch is to be commenced within two years and completed within five years of the passing of an Act authorizing the company to build it. It will be 25 miles in length.

TORONTO.—The shareholders of Peterson Lake at a special meeting held on January 22nd refused to approve the proposal of the directors to sell thirty acres of their property to the Nova Scotia Cobalt Mining Company for 150,000 fully paid shares in the latter company. The proposal to elase ten acres on the west side of the lake to the Little Nipissing Mining Company was unanimously adopted. The Little Nipissing people thus secure ten acres for five years on condition that they do all the development and pay the Peterson Lake Company 25 per cent. of the receipts from ore sales.

Frank Law was fined \$200 on Monday, January 21st, by Magistrate Kingsford. The charge laid was that Law as president of Law & Company, and as an officer of the notorious Highland Mary Mining Company, Limited, had committed a breach of the Companies' Act in issuing false prospectuses.

COBALT.—In the Foster mine vein No. 8 has been struck at the 140 foot level. Good results were obtained from this vein on the 70 foot level.

During 1907 Nipissing shipped a total of 2,406 tons of ore, valued at \$1,375,000 gross. Ore blocked out, ready for mining, on January 1st, 1908, has an estimated gross value of \$1,057,000.

Silver nuggets totalling more than one hundred pounds in weight were stolen on January 21st from the King Edward mine. It is reported that a reward of \$1,000 is offered for information leading to the apprehension of the thieves.

PORT ARTHUR.—J. S. Steele, manager of the St. Anthony's Reef gold mine, on January 20th deposited in the vaults of the Port Arthur branch of the Bank of Montreal several gold bricks. These were the result of a clean-up at the St. Anthony mill. Fifty-five miners are employed at the mine and the mill is running regularly.

Major J. K. Harley, of London, Eng., is reported to have organized a company for the purchase of a large block of iron ore areas at Loon Lake and Beck Siding.

COBALT.—The shipments of ore from the Cobalt camp for the week ending January 4th amounted to 204,420 pounds, as follows:—

La Rose	104,910
Nipissing	54,410
Townsite	45,100

SAULT STE. MARIE.—The "Soo" steel plant is closed; the blast furnaces will be kept in operation.

ALBERTA.

EDMONTON.—As a result of friction between the C. P. R. and the operators the Frank, Bellevue and Hillcrest coal mines are closed, together with a number of smaller mines. About 1,100 miners are out of work. Low prices are the cause of the trouble.

BRITISH COLUMBIA.

GOLDEN.—A small experimental mill has been erected near Golden for working the Elmore Vacuum Oil Process of ore concentration. The mill has a capacity of 40 tons per day. Five years ago the old Elmore process was tried without success at Le Roi No. 2 and White Bear.

NELSON.—The power and milling equipment of the Blue Bell mine, on Kootenay Lake, is now complete. A 200 ton mill has been built and water has been flumed for several miles. The mine is a lead and zinc producer. Upon the completion of the new zinc reduction plant at Nelson, shipments will be made there by the Blue Bell.

The old Hall Creek Placer Mine, 10 miles south of Nelson, on the Spokane Falls and Northern Railway, is to be reopened on a large scale. The gravel has given 20 to 26 cents per cubic yard. For the last ten years Chinamen have worked the ground.

PHOENIX.—For the week ending January 11th the Granby Company's mines were the only shippers from the Boundary district. These mines shipped 12,887 tons of ore and treated 15,695 tons at the smelter. It is hoped that 20,000 tons will be shipped during the ensuing week.

The enlargement of the lead plant of the Consolidated Mining & Smelting Company will make the further shipment of lead concentrates to Europe unnecessary.

The Nicola Valley Coal & Coke Company shipped 3,593 tons of coal during December. The company employ 130 men.

The Vancouver and Hewitt mines of Silvertown shipped eight car loads of ore during the week ending January 11th.

The Granby mines and smelter are in normal working condition. Six furnaces are in blast and 2,500 tons of ore per day are being produced at the mines, where nearly 500 men are employed.

VICTORIA.—The Eastern British Columbia Railway Company is applying for permission to build a railway from Crow's Nest Pass to Eastern Kootenay. If it succeeds it will operate some of its 10,000 acre of coal lands in the last named district.

The Pacific Slate Company of Victoria owns and controls an area of 625 acres of slate-bearing lands. The first shipment from the newly opened quarries arrived recently in Victoria. The quantity shipped was 17,000 square feet. The slate is of superior quality. The property is situated on Jervis Inlet, 80 miles north of Victoria.

SILVERTON.—The week ending January 4th saw the largest shipments ever made from this camp. Eight car loads of ore were shipped to the smelters.

ROSSLAND.—Development has been pushed half way into the Idaho from the fourth level of the Centre Star. On the fifth level the ore body in the Idaho has been cut by a diamond drill hole, and the fifth level is being extended towards the ore. A shaft have been extended down to the fourth level. On the 150 foot level drifts are being extended both ways in good ore. The eleventh level of the Centre Star has been extended into the Idaho, and has resulted in the opening up of an ore body 35 feet wide near the Centre Star end line.

Several stopes on the Centre Star's eleventh level have turned out unexpectedly large. On the thirteenth and fourteenth levels development has been in progress long enough to demonstrate that the vein more than maintains its size at depth, having a width when crosscut on the fourteenth level of 65 feet. Ore stoped from here has run well up to the mine average. Face samples running to a value of \$40 to the ton have been obtained. This is at a depth of 1,900 feet.

In the lower levels of the War Eagle individual samples as high as \$200 to the ton are not uncommon, and a recent shipment of 100 tons ran \$50 per ton in gold alone. This ore is a heavy sulphide. It is worthy of note in this connection that ore from the twelfth level carries copper values considerably above the average.

In the Iron Mask four veins intersect at one point. At the intersection on the fourth level a large ore body is being opened up. The vertical dimensions of the ore are not yet definitely known. One vein that was worthless when the mine was held by former owners, now yields a good profit under present conditions of cheaper mining and treatment costs.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

The Royal Commission on Mines has appointed a committee consisting of Prof. Redmayne of Birmingham University, A. M. Lamb, mining engineer, and W. Walker, Inspector of Mines, to visit a number of representative collieries and report as to the causes of and means to prevent accidents from falls of rock and side and underground haulage.

A notable feature of the coal trade during 1907 was the continued expansion of the export trade. Final returns are not yet available, but in the eleven months ended with November there had been an increase in export of about 7,500,000 tons over 1906, following an increase for the latter year over 1905 of 8,500,000 tons. Sales to Germany increased by 3,500,000 tons, and increased trade was done with nearly every European country.

A serious strike has broken out at the Nottinghamshire coal pits of Barber, Walker & Company, involving 3,000 employees. The men declined to accept a wage scale based on existing prices.

A discovery of gold-bearing rocks has been made at Henllys near Newport, on the Welsh border. A mining expert obtained permission to have the rocks crushed and assayed and they were found to be rich in gold. Gold exists in many places in the United Kingdom, but usually in minute quantities. There are only four producing mines in existence, and the total value of the gold mined in 20 years is £345,645.

RUSSIA.

Near Hagri, in the Caucasus, an abundant deposit of asphalt has been discovered, and a company formed to work it. A large factory is being built in the Zhockari valley, where asphalt will be prepared both for home consumption and export.

The Kamchatka peninsula is attracting the attention of gold miners. Reef gold has been discovered near Petropavlovsk, where prospecting has proved the occurrence of a quantity of gold at a shallow depth.

AUSTRIA-HUNGARY.

A company has been formed at Prague with a capital of 500,000 crowns to develop the coal fields belonging to Oberfinanzrath Kress at Hotomitz, near Dux, Bohemia.

BULGARIA.

The mining industry is being gradually developed with the aid of foreign capital, a number of British capitalists and mining experts having made exhaustive researches in this field. A British company has obtained a concession for working a copper mine at Belogradchik. Copper is also to be found at Vratza and near the Black Sea port of Bowigas. Concessions have been granted by the government for coal, iron, lead and zinc mines in various localities.

CHINA.

A Chinese company has been organized with a capital of \$2,000,000 to open iron and coal mines near Awtow, 55 miles northwest of Tsuantsiu. English engineers have charge of the development work and of the construction of 50 miles of railroad in connection with the mines.

UNITED STATES.

The following figures showing the mineral and metallic production of the United States for 1907 are published by the *Engineering and Mining Journal* as being a close approximation to the actual output, a portion of the returns for December being based on estimates.

Non-metallic.—Coal, bituminous, short tons, 383,480,080; value, \$441,949,931; changes in quantity, I. 41,850,957. Coal, anthracite, short tons, 85,063,264; value, \$159,942,986; changes in quantity, I. 12,853,698. Garnet, short tons, 6,500; value, \$216,125; changes in quantity, I. 1,096. Iron ore, long tons, 52,418,755; value \$110,079,385; changes in quantity, I. 3,201,266. Limestone flux, long tons, 14,925,000; value, \$10,447,500; changes in quantity, I. 373,000. Petroleum, barrels, 165,788,906; value, \$118,408,409; changes in quantity, I. 34,106,401. Phosphate rock, long tons, 1,917,000; value, 13,419,000; changes in quantity, D. 135,742.

Manufactured.—Bromine, pounds, 1,062,000; value, \$138,060; changes in quantity, D. 167,000. Coke, short tons, 40,090,670; value, \$106,757,970; I. 7,400,308. Copper sulphate, pounds, 40,138,117; value, \$2,733,405; changes in quantity, D. 10,787,815. Copperas, short tons, 25,212; value, \$262,120; changes in quantity, I. 4,373. Graphite, artificial, pounds, \$6,924,000; value, 483,717; changes in quantity, I. 2,056,000. Lead, sublimed white, short tons, 8,700; value, \$1,026,600; changes in quantity, I. 712. Zinc oxide, short tons, 83,280; value, \$7,516,360; changes in quantity, I. 5,480.

Metallic.—Aluminum, pounds, 25,000,000; value, \$11,250,000; changes in quantity, I. 10,650,000. Copper, pounds, 895,104,000; value, \$184,937,437; changes in quantity, D. 22,516,000. Gold, oz. fine, 4,335,560; value, \$9,616,017; changes in quantity, D. 312,825. Iron, pig, long tons, 25,975,944; value, \$892,251,523; changes in quantity, I. 668,753. Lead, short tons, 359,058; value, 38,239,677; changes in quantity, I. 13,529. Quicksilver, flasks, 19,900; value, \$805,950; changes in quantity, D. 5,409. Silver, oz. fine, 56,925,911; value, \$37,187,990; changes in quantity, I. 742,411. Zinc, short tons, 246,688; value, \$29,415,077; changes in quantity, I. 21,194.

The zinc separating plant in operation at the Lexington mine of La France Copper Company, Butte, Montana, is declared to be completely successful and likely to prove of great advantage to

the mines in the neighborhood which have on hand quantities of silver-zinc ore. This ore carries silver, gold, copper, lead, iron and zinc, but on account of the predominance of the latter metal the copper smelters have been unable to treat it except at a heavy loss. The new system which has been in operation in Texas for some years saves every metal in the ore.

MEXICO.

Oil in good quantities has been found in three wells drilled by W. R. Hearst and James Keene near Ojinaga in Eastern Chihuahua. One is down 4,000 and another 1,400 feet.

Miners throughout Mexico are being called on to accept reductions in wages of from 25 to 75 cents per day, the reasons assigned being the low price of metals and the increase in the supply of labor caused by the closing down of mines.

VENEZUELA.

President Castro has annulled the contract made by the government with the Venezuelan Salt Monopoly, Limited, an English corporation, signed in 1905, leasing certain salt mines and giving them a monopoly of the sale of salt for ten years.

AUSTRALASIA.

The Queensland Government announce that recent tests of coal from the Government mine on Dawson River have proved satisfactory, the indication being that it is a fuel similar to some of the American anthracites requiring a forced draught for its proper combustion.

A bulletin of the New Zealand Geological Survey gives a description of the large deposit of iron ore situated on the shores of Parapara Inlet, which has so far been left practically untouched. The ore occurs in three enormous blocks, the amount contained in the Washbourn block being estimated at 22,691,762 tons. In 34 samples taken from this block the average iron content was 51.79 per cent. The ore is mainly limonite, though partly gothite and possibly turgite, and phosphorus, sulphur and other impurities do not occur in serious quantities. The deposits are all in accessible localities.

SOUTH AFRICA.

The annual report of the Orange River Colony Mines Department for the year ending June 30th, 1907, states that there was a marked increase in the coal output. The total tonnage produced during the year was 499,590 tons, value £139,674, as against 263,232 tons for the previous year. Keen competition among coal operators in the Transvaal has resulted in price-cutting, which has reached against further development, but prices in the Transvaal have recently been raised by a combine.

Great activity has been shown lately by prospectors for diamonds in Orange River, especially in the neighborhoods of Boshof and Smaldeel. Though the number in the field was unprecedented, the Mines Department report for 1906-97 notes that no discovery of a payable mine was reported, though one or two finds may ultimately prove valuable.

The gold output of the Transvaal for November was 549,801 ounces, valued at £2,335,406, a slight decrease from the production for October.

COMPANY REPORTS.

COBALT TOWNSITE SILVER MINING COMPANY OF CANADA, LIMITED.

The first annual meeting of this company was held on December 30th at Salisbury House, London, E.C. Col. Sir A. C. F. Fitz-George presided. In his report he mentioned that the issued capital of the company is £185,007. One hundred and eighty thousand shares of £1 each are issued fully paid to the Canadian Company. The balance, £5,000, was subscribed in cash at par by the promoters. Five thousand six hundred pounds has been provided by the Canadian promoters in loans for working expenses. The English Company has also advanced £8,240. One hundred and seventeen tons of ore carrying 40,000 ounces of silver have been shipped. The mine is now self-supporting, although funds may be needed if suitable arrangements cannot be made with smelters. The concentrating company, with whom the Townsite has entered into a contract, is expected to begin operations in January. Concentrating ore to the amount of 664 tons carrying about 20 ounces per ton is on the dumps.

Mr. A. J. Young, managing director of the Canadian Company, stated that \$75,000 had been spent on the property. He outlined some of the difficulties overcome and spoke hopefully of the future.

LE ROI MINING COMPANY, LIMITED.

Notice of this, the eighth ordinary general meeting, held in London, Eng., on December 23rd, was crowded out of our last issue. Mr. T. D. Grinmke-Drayton, J. P., chairman of the company, presided, and in his address alluded to the fall in price of copper, to the shortage of fuel, and high cost of labor as having been instrumental in reducing profits. The Northport smelter had a continuous run of only four months. The Trail smelter was closed for a considerable time and was unable then to treat the ore contracted for from Le Roi. Wages and cost of all materials have increased during the year. Nevertheless more money was spent upon development work than for several years past. The main shaft has been sunk to the 1,650 foot level and development pushed on to the Black Bear claim, where the expectation of finding ore was realized.

The chairman, continuing, announced that the financial year is to end hereafter on September 30th and not on June 30th. This will give more value to the annual meeting. Referring to Mr. W. A. Carlyle's appointment as consulting engineer, the chairman said that Mr. Carlyle was chosen because a man was wanted who had had experience of the peculiarities of Rossland mines, who was not connected with any companies whose interests would clash with Le Roi's, and whose name and reputation would command the confidence of the shareholders and the public.

The managing director, Mr. A. J. McMillan, referred at length to the difficulties and hindrances by which the management had been hampered during the past year. A falling off in value of the ore at the rate of nearly \$2 per ton, making a total loss for the year of about \$250,000, made a dividend payment undesirable. However, late vigorous development gave assurance of better ore for the ensuing year. Upon the sinking of the main shaft from the 1,350 to the 1,650 foot level £11,000 was expended. No benefit was derived from this until after June 30th, the end of the financial year. Large shipments made to the Trail smelter under contract, when copper was at a low mark, prevented the company from getting the benefit of the subsequent rise. On June 30th, 1907, the company had in transit and on hand nearly 900,000 pounds of copper, the whole of which was seriously affected by a fall in price. The depreciation amounts to over \$34,000. Although profoundly affected by the fall in price of copper, the company was not hurt by the fall in silver and lead.

Mr. McMillan alluded, in closing, to the cheerful prospects held out for the company year. He predicted a rise in price of copper and mentioned that a substantial reduction in wages had been recently accepted by the company's employees. He congratulated the company upon the appointment of Mr. Carlyle.

Discussion elicited the facts that the smelting costs per ton were \$10.02 on 131,000 tons of ore, and that there was a reduction at the refinery for losses in dealing with the matter. Mr. G. W. Wilson, a retiring director, was unanimously re-elected to the Board.

It is worthy of note that the company maintains a clerical staff in London at an annual cost of \$10,000. This was the subject of some comment.

COMPANY NOTES.

The annual meeting of the Royal Victoria Mining Company was held at Greenwood on January 27th.

It is announced that a dividend of 3 per cent. will be paid on the new Temiskaming stock on February 15th next.

The International Coal & Coke Company, Limited, will, on February 1st, 1908, pay a dividend of two per cent. on its issued and outstanding stock.

The annual meeting of the Dominion Copper Company was held on Monday, January 27th, at the company's registered British Columbia office in Phoenix.

The annual meeting of shareholders in the Silbert Consolidated Mines, called January 22nd, was postponed until February 8th at the King Edward Hotel, Toronto.

Fernie.—The Crow's Pass Coal Company paid out in wages on Saturday about \$200,000. The Home Bank will distribute the money at Coal Creek, Fernie and Michel.

A check has been received from the O'Brien mine by the Provincial Treasurer for \$7,327.75, the 25 per cent. royalty on the mine output for the month of December.

The Dominion Coal Company has declared a dividend on its preferred shares, payable February 1st, 1908. This is the half-yearly dividend of three and one-half per cent.

The Northern Exploration Company, of which Col. A. M. Hay is president, has declared another 10 per cent. dividend, payable January 31st. This makes a total dividend payment of 20 per cent. for the year ending January 31st, 1908.

The financial statement of the Stenwinder Gold & Coal Mining Company, Limited, of British Columbia, shows that the total capital stock now issued amounts to \$666,707.75, on which \$68,170.56 still remains to be paid. The company's gross available funds are given as \$75,301.56. After making certain necessary deductions, there remain \$62,450.15 in cash available for work, machinery, etc. For the year the operating expenses amounted to \$64,535.39.

In a circular dated January 20th, the Nipissing directors make the following announcement: The following is a brief financial statement of the affairs of the Nipissing Mining Company, Limited (the operating company) as of January 1, 1908:

Cash in bank and bullion on hand	\$387,458.00
Ore in transit and at smelters	337,400.00
Ore sacked at mine ready for shipment..	163,542.00
	\$888,400.00

At the annual general meeting of the shareholders of the Diamond Vale Coal & Iron Mines, Limited, held on Wednesday, January 15th, a satisfactory report was read. Before the end of the

current year it is expected that a daily output of 500 tons will be reached. There is evidence that the entire 2,067 acres held by the company is underlaid with coal. About \$50,000 has been spent on development. A complete surface equipment has been installed, and regular shipments of high grade coal have been commenced. The present output is but 25 tons per day in excess of the company's own requirements. Additional working faces will one by one add 20 tons each to the daily output until the maximum capacity is reached.

The annual report of the Northern Securities Company shows that the company during 1907 acquired by subscription 2,067 additional Crow's Nest Pass Coal Company shares. The aggregate holdings of these shares by the Securities Company are valued in the statement at \$3,741,122, the increase in this item for the year being \$516,750. The company, since its distribution of its former holdings of Northern Pacific and Great Northern shares, holds \$2,858,594 of Chicago, Burlington & Quincy shares, and less than a thousand dollars of N. P., G. N. and C., B. & Q. joint bonds. The company received on its Crow's Nest Pass stock \$150,841 in dividends. The net dividend income of the Securities Company was \$330,000, and, after the payment of the 5 per cent. dividend, the balance of income was applied on the payment of securities acquired during the year.

STATISTICS AND RETURNS.

NOVA SCOTIA COAL SHIPMENTS.

Intercolonial Coal Company—Monthly shipments:—

	1906.	1907.	Changes.
January	24,310	23,734	d 576
February	14,831	18,418	d 3,587
March	25,166	16,820	d 8,346
April	23,123	25,738	i 2,615
May	24,125	24,813	i 688
June	27,988	22,374	d 564
July	24,177	23,919	d 258
August	26,885	25,755	d 1,130
September	19,341	21,003	i 1,162
October	26,518	19,973	d 6,545
November	20,726	29,276	i 8,550
December	23,224	22,565	d 659
Total	280,414	274,388	
		280,414	
Decrease 1907			6,026

Acadia Coal Company—Monthly Shipments:—

	1906.	1907.	Changes.
January	20,615	26,228	i 5,613
February	17,999	19,261	i 1,262
March	19,299	18,430	d 869
April	18,174	24,289	i 6,115
May	22,460	24,047	i 1,687
June	26,873	30,639	i 3,766
July	19,983	30,080	i 10,097
August	23,952	29,071	i 5,119

	1906.	1907.	Changes.
September	22,913	28,198	i 5,285
October	27,222	31,987	i 4,765
November	28,976	32,327	i 3,351
December	26,246	27,355	i 1,109
Total	274,712	321,912	
		274,712	
Increase 1907			47,200

Cumberland Railway & Coal Co.—Monthly Shipments:—

	1906.	1907.	Changes.
January	45,816	22,427	d 23,389
February	39,358	25,378	d 13,981
March	40,151	27,982	d 12,169
April	30,980	29,873	d 1,107
May	33,912	36,560	i 2,648
June	33,259	34,310	i 1,051
July	27,706	37,057	i 9,351
August	32,145	.....
September	29,164	.....
October	32,212	.....
November	13,123	28,741	i 14,618
December	20,731	34,389	i 13,658
Total	379,557	276,717	
		379,557	
Decrease 1907			102,840

Inverness Railway & Coal Co.—Monthly Shipments:—

	1906.	1907.	Changes.
January	5,827	15,935	i10,108
February	6,740	11,867	i 5,127
March	8,882	10,776	i 1,895
April	10,885	15,352	i 4,467
May	22,124	21,044	d 1,080
June	18,000	28,062	i10,062
July	19,762	27,960	i 8,258
August	25,145	23,153	d 1,992
September	22,765	22,422	d 343
October	27,452	22,275	d 5,177
November	19,142	22,257	i 3,115
December	15,898	21,971	i 6,073

Total ... 202,562 243,075
202,562

Increase 1907 .. 40,415

Totals.	1906.	1907.	Changes.
Inverness Co..	227,000	283,000	i56,000
Cape Breton Co..	841,000	3,830,000	d11,000
Pictou Co....	593,000	633,000	i40,000
Cumberland Co..	509,000	420,000	d89,000

—From the *Maritime Mining Record*.

BRITISH COLUMBIA SHIPMENTS.

The shipments for the week ending Saturday, 11th January, were light, but this is entirely due to the Boundary. The shipments from Rossland and from the Slocan are above the average and one or two new properties are to be seen upon the list. The shipments from the Boundary section are merely light because of the inability to start at once so large a property as the Granby running in full swing within a few weeks. Within a few weeks the output should be at least up to normal conditions.

Followings are shipments, up to date for the beginning of the year:—

Boundary Shipments.—Week, 12,887; year, 12,887.

Rossland Shipments.—Week, 6,018; year, 11,572.

Slocan-Kootenay Shipments.—Week, 3,216; year, 5,081.

The total shipments for the past week were 22,121 tons, and for the year to date 29,540 tons.

There was a noticeable increase in the amount of ore shipped to the Granby smelter during the week ending January 18th, although the amount is not as yet up to the normal tonnage of the property. On the other hand, the smelter is treating rather more than the ore received, the total tonnage for the week being 17,238 and for the year 32,953 tons, receipts from the mine during the same period being 29,246 tons.

There are a good many shipments this week from the mines of the district around Ymir, where considerable activity is now noteworthy. The Slocan is also well represented.

Following are the shipments, up to date for the beginning of the year:—

Boundary Shipments.—Week, 16,359; year, 29,246.

Rossland Shipments.—Week, 5,381; year, 16,953.

Slocan-Kootenay Shipments.—Week, 2,944; year, 7,679.

The total shipments for the past week were 24,684 and for the year to date 53,869 tons.

The production of the British Columbia Copper Company for 1907 amounted to 8,119,502 pounds of copper.

The output of the Crow's Nest Pass Company's collieries for the week ending January 10th was 23,399 tons, or a daily average of 3,900 tons.

The output of the collieries of the Crow's Nest Pass Coal Company for the week ending January 17th was 24,641 tons, or a daily average of 4,102 tons. For the corresponding week of last year the output was 17,230 tons, or a daily average of 2,871 tons.

The output of the Crow's Nest Pass collieries for the week ending January 24th was 20,705 tons, a daily average of 3,450 tons.

The general results of the operations of the Le Roi Mining Company for the past four years as set out in the subjoining table:—

Year.	Ore shipped. Tons.	Value. Ton.	Costs. Ton.	Profit. Ton.
1904	160,110	\$10.94	\$10.57	\$9.37
1905	114,960	12.41	10.08	2.33
1906	110,042	12.37	10.50	1.87
1907	131,696	10.49	10.02	0.47

Following are the shipments from Cobalt camp for the week ended January 18th:—

	Pounds.
Buffalo	63,000
La Rose	296,000
Nipissing	64,540
O'Brien	120,200
Kerr Lake	39,980
Watts	64,780

The total shipments for the week were 648,590 pounds, or 324 tons.

The total shipments for the year 1907 were 28,010 pounds, or 14,010 tons.

Considering the amount of time lost by miners during the month of December, the output for the different collieries of the Nova Scotia Steel & Coal Company compare favorably with previous months. In all, 11,784 tons were raised, as follows:—

	Tons.
No. 1 colliery	18,560
No. 3 colliery	23,468
No. 5 colliery	6,868
No. 4 colliery	688

The total amount of coal mined from the collieries during the 12 months just ended was 638,065 tons, No. 3 colliery being the

biggest producer, with an output of 296,466 tons; No. 1, with 256,161; No. 5, 82,310 tons, and No. 4, 3,128.

Dominion Coal Company's outputs, 1st January to 15th January, 1908:—

	Tons.
No. 1.....	19,359
No. 2.....	26,273
No. 3.....	13,709
No. 4.....	19,187
No. 5.....	22,905
No. 6.....	9,555
No. 7.....	3,054
No. 8.....	5,703
No. 9.....	13,932
No. 10.....	4,596
Total	138,273

The copper production of the Granby Consolidated Company for 1907 was 15,514,000 pounds, a falling off of more than 2,000,000 pounds as compared with 1906. Shortage of coal and coke along with labor difficulties were the causes of this decline.

The ore production of the St. Eugene mine at Moyie for 1907 was 152,827 tons. Three hundred and twenty-five men were employed. St. Eugene is the second largest silver-lead mine on the continent. It is owned by the Consolidated Mining & Smelting Company of Canada.

Figures covering the output of gold in Rhodesia, South Africa, for the month of December place the total at 53,113 fine ounces, making the grand aggregate for the year 1907 612,452, a new high record. In November the total was 50,891 fine ounces, and in December a year ago was 48,329 fine ounces.

The following table gives the output of gold, by months, for a series of years:—

	1907.	1906	1905.
	oz.	oz.	oz.
January	47,048	42,950	32,531
February	40,482	38,037	30,131
March	46,887	44,574	34,927
April	49,772	42,423	33,268
May	52,668	46,729	31,332
June	54,918	47,664	35,256
July	54,438	48,485	34,693
August	54,790	50,127	35,765
September	53,622	48,410	35,785
October	53,823	45,664	33,383
November	50,891	48,503	32,861
December	53,113	48,329	37,116
Total	612,452	551,895	407,043

During the year 1907 Nipissing shipped a total of 2,406 tons of ore containing silver of an estimated total gross value to the com-

pany of about \$1,375,000. It is impossible, as yet, to figure accurately the value of the ore shipments, as a number of cars are still outstanding.

In addition to the above shipments the Nipissing Company had on hand on December 3 ore of a gross value of \$165,500, figuring silver at 53 cents an ounce.

At the beginning of the 1908 year the Nipissing Company had a tonnage of ore in the mine available for extraction of estimated gross value of \$1,057,000.

The following is an estimate of the value of the ore shipped in each month of the year 1907:—

Month.	Tons.	Silver oz.	Approx. gross value.
January	271.8	176,603	.....
February	183.4	220,642	.....
March	285.0	91,124	.....
May	231.3	188,144	.....
June	337.2	287,407	.....
July	151.3	153,385	.....
August	420.5	302,324	.....
September	158.9	323,227*	\$1,132,858
October	64.7	151,108	.....
November	118.6	32,397	.....
December	183.4	273,778**	242,360
Total	2,406.1	2,200,143	\$1,375,218

* At 65c.

** At 53c.

Shipments from the Cobalt camp, December, 1907:—

Mine.	Tons of 2,000 lbs.
Buffalo	132.100
Coniagas	87.70
Drummond	28.55
Kerr Lake	52.75
King Edward	31.12
La Rose	130.22
McKinley-Darragh	561.28
Nancy Helen	30.10
Nipissing	189.37
Nova Scotia	120.00
O'Brien	29.95
Right of Way	62.10
Silver Leaf	24.60
Temiskaming	22.80
Temiskaming & H. B.	32.00
Trethewey	31.00
Total	1265.64

This was shipped as follows:—

Canada, 250.16 tons, or 19.77 per cent.

United States, 1015.48 tons, or 80.23 per cent.

For the first nine months of 1907 the Dominion Government paid in bounties to the iron and steel manufacturers of Canada \$1,299,000, of which the Algoma Steel Company obtained \$348,000, the Dominion Iron & Steel Company \$699,000, the Nova Scotia Steel & Coal Company \$93,000, and the Hamilton Steel & Iron Company \$125,000. This bounty was paid on pig iron, puddled bars, steel ingots and manufactured steel.

The total bounties paid to manufacturers by the Dominion Government for the past few years are as follows:—

1906	\$2,050,000
1905	1,540,000
1904	908,000
1903	1,401,000
1902	791,000
1901	467,000
1900	312,000

A new record was made at the plant of the Dominion Iron & Steel Company on Monday, January 6th, when in twenty-four hours the blast furnaces turned out 1,135 tons of pig iron. This is the best day's work yet done at the works. The previous week a record of 1,027 tons was made.

The production of gold at the Rand in December is officially announced at 583,526 fine ounces, valued at £2,478,659. The preliminary statement, which was sadly out, placed the production last month at 540,000 fine ounces. In December last year the output was 550,167, and in December, 1905, 431,594 fine ounces. The out-turn of gold at the Rand for the calendar year ended December 31st last aggregated 6,551,662 fine ounces, against 5,786,617 fine ounces in 1906, and 4,897,221 fine ounces in 1905.

The first estimate of Canada's gold production in 1907 shows a decrease as compared with 1906. The yield of gold from British Columbia was nearly a million dollars less than in 1906, and there was a further falling off in the Yukon. The placer mines at the end of the year, however, were in such a position as to indicate a larger output. During the current year than in 1907. Together the declines in the British Columbia and Yukon fields in 1907 represented a loss of two and one-half millions. The output in 1906 was \$12,023,032. This year's production is \$9,500,000, the decline being in exact figures \$2,523,032, which is a little less than the decrease in the entire world's production. The output in the United States fell off by nearly six millions, and that of Australia by seven millions. Large gains were made in Africa. Although the Transvaal output was enormously increased since the Boer war, it is now receiving a setback. Monthly returns continue to reflect decreases, the output for December being ten thousand ounces below October. The value of the Transvaal December output was \$11,475,000, compared with \$11,677,000 in November, and \$11,684,000 last December.

Crow's Nest Pass Coal Company, Fernie, B.C.—There is a very marked increase in the annual output of the collieries and coke ovens of this company. The total production might have been larger had the management been able to rely upon regular orders from the smelters. As has been mentioned before in these columns, the increase of wages at the smelters in South Eastern British Columbia disturbed the balance of labor during the summer. The reduction of wages following hard on the heels of the fall in price of copper, was an inevitable consequence of an ill-advised step. Temporarily the higher wages paid at the smelters drew workmen from Fernie and left the Coal Company short handed. Yet the year's output is more than satisfactory.

1906—Coal, 806,901 tons; coke, 213,295 tons.

1907 (approximate—not including December)—Coal, 985,000 tons; Coke, 235,000 tons. Increase over 1906—Coal, 22 per cent.; Coke, 10 per cent.

When returns are complete the coal tonnage will exceed 1,000,000 tons and the coke, 250,000 tons.

The Crow's Nest Pass Coal Company will, during 1908, practically double its output.

INDUSTRIAL NOTES.

From the Christman Company, Massilon, Ohio, we have received a catalogue of their drilling machinery and mine equipment. Features of especial interest are their automatic switch and signal for use in coal mine tipples and at partings in mines, and their hollow rod tools for test drilling. The former device is labor-saving; the latter has one or two valuable improvements. Hollow rod tools are especially adapted for drilling test holes for coal, lead, zinc, placers, water wells, foundations and all work where continuous samples of successive strata are desired.

The Mashek Engineering Company has changed its location. It is now established in larger and better quarters at 141 Broadway, New York. The coal briquetting machinery rendered this change essential.

MARKET NOTES.

Silver.—January 2nd, 54 1-4; January 3rd, 55 1-8; January 4th, 55 5-8; January 6th, 55 7-8; January 7th, 58 3-8; January 8th, 57 1-8; January 9th, 56; January 10th, 54 3-4; January 11th, 55 1-4; January 13th, 56 3-8; January 14th, 55 7-8; January 15th, 55 5-8; January 16th, 56; January 17th, 55 3-8; January 18th, 55 1-2; January 20th, 55 5-8; January 21st, 55 1-2; January 22nd, 55 1-2. Sterling Exchange, January 22nd, \$4.8675.

Copper.—January 22nd, New York, lake, 14 cents per pound; electrolytic, 13 3-4 per pound; London, standard £62 12s. for spot. Market steady. Fair business doing.

Lead.—New York, 3.75 per pound; London, £14 10s. for Spanish lead. Market steady and unchanged.

Tin.—New York, 28 cents per pound; London, £124 for spot.

The growing tendency to install tube mills as accessories of the stamp mill will have a strong bearing upon the gold industry of Canada, particularly that of Nova Scotia. Whilst the tube mill has not yet been standardized, different makers producing highly divergent types, yet several makes are efficient and economical. A study of the tube mill in its relation to South African gold milling induces the belief that several Nova Scotian gold mines could be revived if a well-designed equipment were installed. The designing and arrangement of overground equipment must meet the special requirements of each mine. The erection of standard stamp mills, ordered from the manufacturer's catalogue, is often a serious blunder.

Among the best gold miners of Canada are Nova Scotians who have worked in British Columbian camps and have had the added advantage of working the Nova Scotia lodes. Usually these men are expert hammersmen and can also handle a machine to great advantage. The Nova Scotian miner in fact is usually proficient in timbering also.