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RICHARD P. ROTHWELL, C. E. M. E., Editor. ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor. THE SCIENTIFIC PUBLISHING CO., Publishers.

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The record of iron ore shipments from a single mine is noted by our Minnesota correspondent in another column, where the Mahoning Ore Company shipped in one day 13,000 long tons, or 361 car-loads. Of these cars 116 carried 50 tons each, the balance about 27 tons. This ore was not loaded from a stock-pile, but direct from the mine, which is one of the "steam-shovel" mines of the Mesabi Range. Three steam-shovels were in use, and the ore had no preparation beyond the stripping of the surface, except a few charges of black powder to loosen it. We do not believe that this shipment can be equalled anywhere else in the world.

The news from Butte, given in another column, shows that the Montana Ore Purchasing Company and Mr. W. A. Clark have acceded to the demand of the Butte Miners' Union for a working day of eight hours at the existing rate of wages. On the other hand the Anaconda and other properties controlled by the Amalgamated Company refuse to reduce the working time. The question of an eight-hour day has been pending for some time, and the announcement that Messrs. Heinze and Clark had agreed to it was made on the anniversary of the Miners' Union. This must be regarded as a shrewd move of the Heinze-Clark party, especially on the political side of the case; but it complicates matters in Butte, and may be followed by serious trouble there for the Amalgamated Company's properties.

European papers note the arrival at Cronstadt, the port of St. Petersburg, of the steamer "Accomac" with 3,500 tons of anthracite coal from Philadelphia. This is the first cargo of the kind, and it is understood that it will be followed by others consigned to Baltic ports. It is stated that the price at the Russian port will be in the neighborhood of 16 1/2 roubles, or about \$8 a ton. Russia imports a large quantity of coal, its own supplies being insufficient, while the location of the chief mines is such that they cannot put down coal in St. Petersburg and the cities near the Baltic seaboard at a price to compete with foreign coal brought by water. The trade heretofore has been entirely with Great Britain, but there seems to be an excellent opening for American coal. This anthracite is doubtless for use by the Russian Navy, because it makes no smoke. American bituminous coal would be more economical.

The article on "Mining Concessions in China," given on another page, is written by a mining engineer of high reputation, who speaks from personal experience. The still imperfectly known possibilities of mining in China are attractive because of their uncertainty and the vague promise of great profits which they hold out; while people do not realize the difficulties attendant upon the working of mines among such a people as the Chinese, and under such government as now exists in China. We say nothing of the rebellion now in progress, nor the complications which are likely to follow; apart from these, the difficulties imposed by the nature of the Chinese people and the peculiar standing of the Government at the present time are quite sufficient to prevent any profitable or systematic work from being undertaken with prospects of early success. Similar difficulties, though not so great, are met with in working Russian concessions. Mr. Church's paper should be read by all who are interested, or who think of taking an interest in some of the Chinese companies or syndicates.

The formal note from the Russian Embassy in Washington, which has been made public by the State Department, and which was published in our news columns last week, confirms what we have heretofore said, that all unauthorized expeditions of American prospectors to the Siberian coast will only result in serious trouble for those who take part in them. The Russian note is courteous, but emphatic in its terms; and makes it clear that no Americans or other foreigners will be allowed to prospect or mine gold in Siberia except under concessions which comply with all the terms and formalities of Russian law. This does not imply any unfriendly feeling toward Americans; indeed, the contrary is shown by the fact that Russian holders of concessions have already engaged mining engineers and contracted for machinery in the United States. It only shows an insistence in the enforcement of local laws and regulations which is entirely within the rights of the Russian Government. We trust that this warning will be kept in mind and that prospectors and investors will keep clear of all wild schemes which involve an extension of operation to the Siberian coast, however attractive they may seem—on paper.

The Utah lead producers have formed an association which is intended to take in all the lead mining companies of the State, and in which most of them are already represented. The intention is to form similar associations in Colorado, Idaho and Missouri, all of them to act together or possibly to combine in a national association. The object is to maintain the price of lead at as high a point as the tariff will permit; and the plan proposed is to raise a fund which will be used to buy up and export any surplus of the metal beyond what the domestic market will take. This fund is to be raised by assessing the producers to an amount to be regulated by the current price of the metal. This movement has

been started on account of the recent fall in price which, it is understood, is the result of the refusal of certain large producers—chiefly in Missouri—to assist any longer in maintaining an artificial quotation. In view of the condition of business they preferred to reduce the price and secure sales rather than to accumulate large stocks through the dull season.

As our readers know, we have never approved of such combinations as the one now proposed. We believe that policy is a mistaken one, and in the end will injure the producers more than a temporary maintenance of high prices will benefit them. The combination is sure to break down in the end under the pressure of dull times; while in some measure also it will assist in the coming of such times. Moreover, the lead producers should remember that every such combination gives powerful aid to the anti-tariff sentiment, which is already so strong and is growing so rapidly.

The use of aluminum and its alloys makes very slow headway in England. The British Aluminum Company, Limited, which at present has a complete monopoly for its manufacture and sale in the United Kingdom, complains that neither the British Government nor the general public has as yet become aware of its many advantages. The War Office has tried it in connection with ballooning and field telegraphs, but not at all in the soldiers' equipment nor in the army service nor transport departments. In Germany about half of the output of the Neuhausen Works is used for military purposes. The British Navy has made more use of it than the Army, and finds application for it in internal fittings of ships and for torpedo tubes. Another remarkable fact is that the British railway companies still class aluminum among precious metals and charge a correspondingly high freight for it, much to its disadvantage in competition with copper, brass and iron. The French company finds considerable demand for aluminum alloys in the construction of automobiles. Both the French and the German companies pay satisfactory dividends. They have regular outlets for their production, but the British Aluminum Company labors under the disadvantage of having no large regular customers and most of its output goes to trial orders, which, of course, entail additional expense in their execution. The company does not pay any dividends on its ordinary shares and is behindhand with the preference dividends. The directors are issuing £100,000 more capital in order to extend the water-power and to obtain a share in the ownership of the Irish bauxite mines, from which the company at present obtain most of their supplies. The company does not inform us what the output of the metal and its alloys is. As regards calcium carbide, the company is erecting works, but has not commenced production so far.

#### THE ELMORE CONCENTRATION PROCESS.

A process which has been operated experimentally at Glasdir, Wales, and which has some points of novelty, is described in an article given in another column. The use of solutions of greater specific gravity to effect separation of minerals of differing specific weights is not new, as Sonstadt's solution of the mixed iodides of mercury and potassium has been used on a practical scale by mineralogists, as has the double nitrate of silver and thallium. A solution of calcium chloride has also been employed to effect the separation of coal and pyrites; but liquids of lower specific gravity than water have been utilized rarely to effect mineral separation. Indeed, the petroleum residues used in the Elmore process do not effect separation owing to any differences in specific weights, but the action of the liquid depends largely upon the difference between its physical effect on metallic constituents and on rock mass. In this the method recalls the use of a greased table surface for collecting diamonds and separating them from barren gangue, in use in the Kimberley Fields.

The Elmore method, in brief, consists in wet crushing, with, in the case of Glasdir ores, five tons of water to one ton of ore, mixing with one ton of petroleum residuum in a specially-devised apparatus, and a separation of the hydrocarbon, in which the concentrates are suspended, from the water and gangue. That the results under special supervision seem to indicate some merit in the process, or at least its applicability under special and favorable, though obviously unusual circumstances, seems to be shown. The material at Glasdir was extremely low grade, averaging 1.17 per cent. copper, about \$1 in gold and 0.8 ounce silver per ton. From this the satisfactory extraction of 70 per cent. of the copper, 69 per cent. of the gold and 65 per cent. of the silver was made with a concentration of 14 tons of ore into one ton of concentrates. These results, considering the class of material, were fairly satisfactory, but the cost of oil at 16 cents per gallon, or over 32 cents per ton of ore, as two gallons were lost in the concentrators alone for each ton treated, renders it doubtful if the process can supersede the simple methods of wet concentration now employed with economy. The cost at Glasdir for petroleum residues alone exceeds the total cost of crush-

ing, amalgamation and concentration of auriferous iron pyrites at the Alaska-Treadwell Mine.

Furthermore, as the article points out, the process is one of delicacy, requiring great nicety in manipulation. The pulp, moreover, should show little variation in its metallic contents, and the temperature should be constant, as the viscosity of the oil, upon which success depends, lessens with heat and increases with cold.

We are not aware that the process has been applied to the separation of diamonds from disintegrated "blue ground," but owing to the known behavior of these precious stones on greased surfaces, there would seem to be reason to hope for some experimental success in this direction.

As to novelty, some two years ago Mr. A. W. Howitt, for many years Secretary for Mines in Victoria, announced that his son had perfected a process of separation of fine and so-called coated gold from ore by means of petroleum. The gold, it was stated, remained with the petroleum or was suspended in the water adjoining the petroleum. Mr. Howitt's high standing and reputation attracted attention to the method, which, however, has not been applied as yet, on a practical scale, at least to our knowledge. It is possible that the younger Mr. Howitt anticipated Messrs. Elmore in principle, though probably not in the details of practice which seem to have been worked out with much ingenuity by these patentees.

Messrs. Elmore's process is interesting, certainly, but we do not think that in its present form it will have extensive application in the concentration of the more common minerals.

#### WET METHODS OF COPPER EXTRACTION.

Owing to the large deposits of low-grade silicious copper ores found in several of our Western mining States and Territories, much interest has been felt toward processes which will economically treat these ores. Smelting, owing to the absence of flux, or concentration, owing to the scarcity of water, is not to be considered. Sulphuric acid processes therefore have been adopted in several instances. The Black Warrior Mining Company, of Arizona, has a leaching plant, with 25 lead lined tanks. Its acid is at present brought from California, but the erection of an acid plant is contemplated in the near future. The sulphide ores which underlie the oxidized ores now treated will be the source of sulphur. The process, or series of processes, will then resemble the treatment of the low-grade ores and concentration tailings at the works of the Arizona Copper Company, at Clifton. Regenerative processes would result in great economy, as sulphuric acid, even when manufactured at the mine, is a great source of expense. The loss of sulphuric acid incurred in neutralizing alkalis and alkaline earths, and in decomposing carbonates, is large on most ores, so that a regenerative ammonia process would be of enormous utility if brought to the point of commercial success.

Our attention has been called to this matter by the American Copper Mining and Extraction Company of Colorado and Utah (Gardiner process), which has published a pamphlet in which it makes strong claims for a process, which it states is patented, though no information is disclosed. Not even the solvent is mentioned.

We have, however, a copy of the patent, which was not issued until after the circular was sent out. It is No. 649,296, of date May 8th, 1900, granted to Robert Gardiner of Salt Lake City. The specifications provide for a leaching solution composed of "water, substantially pure, 500 gallons; sulphuric acid ( $H_2SO_4$ ), 50 pounds; nitric acid ( $HNO_3$ ), 25 ounces; salt ( $NaCl$ ), 20 ounces; permanganate of potash ( $K_2Mn_2O_8$ ), 10 ounces." It will be seen that sulphuric acid is the chief and active agent in the leaching liquor, though the specification provides that "the above proportions may be increased or diminished according to the nature and quality of the ore to be treated." It is further stated that the ore should be crushed to about 30 mesh, and that it should be in the leaching tanks about 24 hours. It was hardly necessary to add, as the specification does, that "it is not claimed that the above composition of matter can be practically used for the treatment of copper pyrites (chalcopyrite)."

It will be seen that this patent covers practically only one point. The use of sulphuric acid for leaching copper ores is, of course, not patentable, since it has been long employed for that purpose; while the use of nitric acid, salt and permanganate of potash is covered by the Black-Skeet patent. The sole point in the Gardiner patent, therefore, is the combination of the permanganate process, which has for its object the generation of chlorine in the solution, with the sulphuric acid leaching. The object or advantage of this combination is not altogether clear, and it seems not impossible that its chief object was to make the securing of a patent possible.

There is some discrepancy between the statements of the prospectus and the claims of the patent. In the patent the time in which the copper will be dissolved is given at "within 24 hours," but the prospectus says that the "time required for treating ore running 3 per cent. is

about one hour from the time of starting until the copper is precipitated." We should be much more inclined to take the time limit of the patent.

Upon the whole, we can hardly look upon the Gardiner process as an addition of any appreciable value to our metallurgical methods. We should scarcely consider it worth mentioning if we had not received several inquiries from correspondents with regard to its merits.

This company is not the only one with leaching processes. We have been informed that promoters of several secret methods of wet copper extraction have unloaded some of their shares or interests in Boston. These processes, requiring a simple plant, and comparatively light preliminary expenditure on paper, are attractive to companies with limited working capital, particularly if these are controlled by people unfamiliar with copper metallurgy. As the effect of most of these processes is to make the small working capital still smaller, the responsible parties should protect their fellow shareholders by securing the advice of competent metallurgists before going to even a small expense.

#### NEW PUBLICATIONS.

"A Text-book on Ore and Stone Mining." By C. Le Neve Foster. Third edition, 1900. London; Charles Griffin & Company, Limited, and Philadelphia; the J. B. Lippincott Company. Pages, 744; with 716 illustrations. Price, \$10.

The publication of a third edition of Mr. Le Neve Foster's excellent work, to meet the steady demand, affords us an opportunity to express our appreciation of its merits. There is no occasion for criticism, since the book was reviewed in our columns on its first appearance, and the author's official duties have not allowed him time to make any additions or any general revision of the present edition. It is to be hoped that he will be able to undertake such a work for the fourth edition, since any text-book of the kind needs some additions to keep it up to the constant changes and improvements that are going on in mining machinery and methods. As it stands, however, this book is the best treatise of the kind to be found. It is clearly and well written, the selection of matter is generally judicious, and the student will find it a safe and reliable guide. The years during which it has been before the public have shown its excellence, and we have no doubt that it will continue to be accepted generally as a standard work.

"A Dividend to Labor. A Study of Employers' Welfare Institutions." By Nicholas Paine Gilman. Boston and New York; Houghton, Mifflin & Company. Pages, 400. Price, \$1.75.

In this volume, which is really a continuation of his work on "Profit Sharing," published some years ago, Mr. Gilman takes up a question of much economic importance, which also presents many difficulties when we endeavor to answer it practically. Theoretically the right of labor to share in the profits of production can be demonstrated logically; but when we come to reduce this theory to practice we find the widest differences of opinion. The ordinary way in which labor receives its share when the business improves and the profits of any trade or manufacture increase, is in increased wages; and in the same way its corresponding share of the losses is met by a reduction in wages. Theoretically again, this ought to be a matter susceptible of easy and equitable adjustment; but practically the process is accompanied by great friction, endless discussion, strikes, ill feeling and often violence. It is probable that this will continue as long as human nature remains what it is; and indeed labor troubles seem to be on the increase as the power of associated capital grows, and the line between the laborer and the capitalist is more sharply drawn.

When we go beyond the simple adjustment of wages and look for some plan by which labor can share in the varying profits of an enterprise, we are again met by many perplexing questions. What is the equitable remuneration of the capital invested, which is indispensable to the starting and conduct of the enterprise; what should be the corresponding share of labor; how far should labor share in the losses as well as the profits; where is the line to be drawn between wages and profits; what distinction is to be made between the capable and the inefficient workman; what share should labor have in the regulation of the plan—these are only a few of the problems which must be solved, and they are not easy ones by any means. In this country also we must reckon with the independence of the workman, who is very apt to resent any plan which seems to interfere with his individuality or to involve charity or patronage. We have had some marked instances of this, notably in the Pullman failure, the direct result of too much paternalism.

Mr. Gilman does not undertake to answer these questions directly. Its object is to show what has been done in the way of paying labor its share of profits; to describe the experiments made, their respective success or failure and, so far as possible, the reasons for either result. In Part I. the question is considered from the employers' point of view. Part II. notes what has been done in different countries, including the United States. Part III. describes in detail several profit-sharing plans, one being taken from French experience, one from British, and three from American work. In addition to the work mentioned in this brief sketch, there is a chapter on "Some Dangers of Paternalism"; a list of firms and companies having profit-sharing plans in operation; some account of plans which have been tried and abandoned; and a list of books and papers bearing on the subject. The book is throughout carefully written and is evidently the result of thorough and careful study. It should be read by all who are interested in the complex relations between capital and labor—and there are very few of us who are not.

"Les Charbons Britanniques et leur Epuisement. Recherches sur la Puissance du Royaume Uni de Grande Bretagne et d'Irlande." Par Ed. Loze. Paris, France; Ch. Beranger. Two volumes, pages 560 and 670; with maps and diagrams.

The author of this work has recognized fully the importance of coal in the development of modern industries; and taking this as his text he has traced the past industrial history of Great Britain and seeks to forecast the future. M. Loze is a careful student, and has collected a great deal of information, which he presents in generally clear and concise form. The first and second parts include an account of the first discovery of coal in Great Britain and its subsequent exploitation. This is followed by a general account of the geology of the country and a detailed study of the great coal basins, their extent and probable contents. Many statistics of production, consumption and exports are given.

The third part is devoted to a study of the commercial and industrial geography of Great Britain. The means of transportation by land and water are carefully studied, and it is shown how the improvement of rivers, the building of canals and finally the construction of railroads made the distribution of coal easier and stimulated its production. It is shown how the great industrial centers were gradually built up and how the possession of great stores of fuel enabled Great Britain to take the lead among European nations and to become the great manufacturer of the world. It is also shown how the command of coal and of materials of construction built up the sea power of the country and enabled it to extend its colonies and its commercial influence all over the world.

M. Loze recognizes the present power and position of the British Empire, but he does not believe that it is destined to last; and after the studies already noted he enters into another, which is really the main object of his book. In this he seeks to show that the time when the coal deposits of the British Isles will be exhausted is rapidly approaching. Very soon, he thinks, the export trade in coal must be given up, or abandoned before American competition in Europe, Japanese and other competition in the East. In the second half of the twentieth century, the book endeavors to prove, an era of grave difficulties for Great Britain will begin. There can be but one result, and the severest struggles can only postpone for a time the final loss of industrial, commercial and maritime supremacy.

Naturally, many will contest M. Loze's conclusions. We believe that his anti-British prejudices have in several ways influenced his conclusions, and we should be inclined to postpone to a much later date the exhaustion of the coal deposits. It must be admitted, however, that he has collected a great mass of information and has collated and arranged it with care and judgment. His conclusions are doubtful, but his work has been well done and his arguments well presented.

An appendix gives comparative statistics of the production and consumption of mineral fuel—coal, lignite and petroleum—throughout the world. Another gives a full account of the British military and naval forces, their organization and the methods of recruiting and maintaining them.

The book is accompanied by a number of maps, plans, tables and diagrams; and it is, as we have already said, evidently the result of much careful study. The main defect is in the strong prejudice which has, in more than one place, warped the writer's judgment and his perception of the proper relation of facts.

#### BOOKS RECEIVED.

In sending books for notices will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

"Journal of the Canadian Mining Institute." Volume III., 1900. B. T. A. Bell, Secretary. Ottawa, Canada; published for the Institute. Pages, 268; illustrated.

"Topographic Surveying: Including Geographic, Exploratory and Military Mapping." By Herbert M. Wilson. New York: John Wiley & Sons; and London: Chapman & Hall, Limited. Pages, 930; with 199 illustrations. Price, \$3.50.

"British Columbia: Annual Report of the Minister of Mines for the Year Ending December 31st, 1899." Smith Curtis, Minister of Mines; William Fleet Robertson, Provincial Mineralogist. Victoria, B. C.; Provincial Printer. Pages, 346; with maps and illustrations. Price, 50 cents.

#### CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials will only be published when so requested.

Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

#### The Parrot Hoist in Butte.

Sir: The Anaconda "Standard" of June 11th, in a series of articles describing the mining works of the great Butte district, has the following paragraph relative to the Parrot Mine: "The hoisting engine is a Fraser & Chalmers with main cylinders 20 by 60 in. and of about 600 H. P. The engine is of peculiar type, the main cylinders having smaller ones parallel with them of perhaps 10 in. diameter, which serve as a reinforcement. There are also three small auxiliary engines used in controlling the brakes. The engine appears to be an exceptionally fine one."

As someone may be mystified by the supposed peculiarity of small cylinders described as reinforcing the large ones, it may be remarked that these small cylinders are simply the steam chests of piston valves about which there is nothing peculiar. The auxiliary steam cylinders control brakes, clutches and reverse gear respectively. The hoist is

a fine one and has been six or eight years in service. Piston valves are perfectly balanced, run easy and are liked by some engineers, but must be carefully watched and maintained against leakage. On later designs by the same makers Corliss valves or balanced slide valves are used in preference.

Charles H. Fitch.

Oak Park, Ill., June 15, 1900.

#### Minerals in the Amazon Valley.

Sir: The geological conditions in the Amazon Valley are very interesting, but have never received anything but the most superficial investigation. There is no mining industry, however, in the whole Amazon basin. The reason is the lack of suitable labor. Some coal deposits exist, but have never been worked, and it is easier and cheaper to import coal than to explore and open these local beds. A poor quality of coal is found at some distance up the Rio Branco, above Manaos, and also on the Rio Negro, to and below Manaos. At Equitos there is also a deposit of coal or lignite. Near the same place, up the Rio Napo, gold is said to exist and is worked by the Indians, who recover small quantities. The district has never been explored or prospected by white men.

Coal all along the Amazon being very dear—as it is all imported—the river steamers generally burn wood.

It is said that the richest gold deposits are in the border territory which is in dispute between Brazil and French Guiana. The location of many of these placer deposits is very vague and indefinite; in fact, the whole region is very little known, though the work of prospectors and adventurers has shown that there is gold there.

Para, Brazil, April 25, 1900.

E. Ackermann.

#### The Assaying of Copper Bullion.

Sir: Referring to Mr. W. Randolph Van Liew's valuable article on "Causes of Losses of Silver and Gold in Copper Bullion Assaying, and a Method for Overcoming Them" ("Engineering and Mining Journal," April 21st and 28th, 1900), it seems feasible to shorten the time of his proposed method by one-half. It is done by placing the weighed copper borings and nitric acid of the specified dilution in a sufficiently capacious beaker and passing air from a Richards blower (furnished with the well-known filter pump) through the liquid from the very beginning of the process, instead of waiting until all the copper has quite dissolved, as in Van Liew's method. In lieu of a blower, the current of air may be conducted in a flask by proper connection with the filter pump or the aspirator. In the latter case, a series of flasks containing different samples may be run in a row with one filter pump. The three-fold object of passing air throughout the stage of dissolving is to remove nitrous acid or lower oxides of nitrogen nearly as soon as formed; and to greatly hasten the solution of the copper by keeping the acid liquid constantly agitated; and after NaCl has been added, to quicken the settling clear of the silver chloride.

Mr. Van Liew's observations are, nearly all of them, practically correct and confirm what has been long known to chemists well posted in this specialty. Too strong nitric acid invariably causes low results on gold; and when a decided excess of sodium chloride solution is added to precipitate silver, after dissolving the copper in strong nitric acid, all the way up to nearly 100 per cent. of the gold present will be found to have been dissolved and lost, the greater proportional loss occurring when a small quantity of gold is present. On the other hand, when the nitric acid is sufficiently dilute and only a moderate excess of NaCl is used afterward, the loss of gold is at a minimum.

The keeping cold of the liquid while dissolving and the elimination of nitrous acid without the aid of heat at the end of the operation of dissolving are the two new points Van Liew has proposed for the further refinement of the standard method. On this point it is well to quote Fresenius, who was speaking of gold alloys: "If the alloy were treated with concentrated nitric acid and at a temperature below boiling, a little gold might dissolve in consequence of the co-operation of nitrous acid."

Two facts came out very strongly in my experience and have not been touched upon or emphasized in the literature of this and kindred subjects, namely: 1. When there is more gold than silver in the sample, it takes very much more lead to scorify or cupel away the copper than when there is an excess of silver over gold. Gold is more strongly tenacious of copper than silver is. 2. The smaller the proportion of gold in the silver-gold bead, the more dilute (within certain limits) the nitric acid must be used in parting at the first boiling. The second boiling, which must never be omitted, may be more safely done with stronger acid. Gold assays on beads from lead or copper bullion are slightly higher when the parting is performed in a porcelain capsule or crucible than in a test tube or matrass, apparently because the nitrous acid leaves the crucible more quickly and therefore has less time to affect the spongy gold at the bottom. This is paralleled by the fact that when one tries to dissolve a quantity of spongy gold in aqua regia (for making "proof gold") he can do it readily enough in a flask, but with great difficulty in a dish, because the free chlorine and its gaseous compounds with nitrogen, leaves the dish prematurely.

Up to several years ago I was doing some copper bullion assaying as part of my routine work, but in my present field I have nothing at all to do with that branch of work, and therefore have no facilities for it; else I would have been pleased to subject Mr. Van Liew's method to a careful trial with the standard methods in modern use.

George T. Dougherty.

Chicago, May 31, 1900.

**PIG IRON PRODUCTION IN GERMANY.**—The production of the German blast furnaces in March was 694,650 metric tons, being 73,943 tons more than in February, but 14,389 tons less than in March, 1899. For the three months ending March 31st the output was: Foundry iron, 366,615 tons; forge iron, 394,807 tons; Bessemer pig, 110,324 tons; Thomas (basic) pig, 1,102,123 tons; total, 1,973,869 tons. This compares with 1,991,818 tons in 1899, showing a decrease of 17,949 tons, or 0.9 per cent.

#### THE INTERNATIONAL MINING CONGRESS.

The Congress opened in Milwaukee, June 19th, with about 300 persons present. The meeting was called to order by the president, Mr. B. F. Montgomery, of Cripple Creek, Colo. In his opening address President Montgomery reviewed at length the importance of the mining interests of the country. He recommended action looking to the thorough revision of the Federal mining laws. He argued in favor of the abolition by act of Congress of extralateral rights, or the right to follow a vein or lode into the land of an adjoining owner, and an enlargement of the location, requiring that each owner of a claim be circumscribed by the surface lines of his claim drawn vertically downward. President Montgomery urged action to induce Congress to pass the bill to create a department of mines and mining like that of agriculture, with a secretary who should be a member of the Cabinet.

Addresses followed from ex-Governor Bradford L. Prince, of New Mexico, and others. Gov. Prince referred to the importance of the coal mines of New Mexico, and to the growing trade between the United States and Mexico.

The programme of the Congress was published in our last week's issue. Exhibits of mining machinery were made by the Edward P. Allis Company, of Milwaukee; H. A. Newkirk & Company, and the Goodsell Company, of Chicago, and a few others. A display of ores and minerals from Colorado was made, and some specimens from Illinois, Wisconsin, Michigan and Missouri were also shown.

**BELGIAN DEMAND FOR COAL.**—United States Consular Agent Dodt writes from Verviers, May 14th, 1900: "There is inquiry for bituminous coal for boiler furnaces and the present emergency offers a good opportunity to introduce American coals into Belgium. Since December, 1898, I have been writing to coal concerns in the United States, but without result. People here are anxious to import large quantities, and I would like to know prices of bituminous coal delivered in Antwerp."

**GOVERNMENT DRILLS IN ONTARIO.**—The Ontario Government has purchased from the Sullivan Machinery Company a second diamond drill, for use in Eastern Ontario, owing to great demand for the drill already in use in testing the size and continuity at considerable depths of ore deposits—before spending money in opening up. The second drill will bore to a depth of 500 ft., the diameter of core being 15-16 in. Applications for the use of the drill should be made to the director, Bureau of Mines, Toronto. The regulations regarding the public use of the drill are very liberal.

**IRON ORE DISCOVERIES IN ENGLAND.**—A valuable find of rich veins of iron ore has been made at Marton, between Barrow and Ulverston, in Lord Derby's royalty, says the London "Engineer." Two boreholes have been sunk, and in the first hole solid ore was struck only a few feet from the surface, and was found to be of good quality. The borers continued their operations, and for 25 ft. 6 in. have gone through fine hematite blast ore, and have not yet ascertained its full extent. At the second hole ore was struck at a depth of 120 ft. It has been proved to be 38 ft. in thickness, as far as the borers have gone.

**AN UNUSUAL MINE ACCIDENT.**—An unusual accident occurred recently in the Saint-Pierre pit of the Ricamarie Colliery in France, owned by the Montrambert Company, says the London "Colliery Guardian." A gang of five men was proceeding to clean out the sump, from which the water had been allowed to run off by a borehole, when the marsh gas that had collected in the hole exploded in contact with a lamp flame. Out of the five lamps four were extinguished; but with the fifth lamp one of the men was able to go for help, when all the men, who had been burned, though not seriously, could be taken up to the surface.

**COAL IN PRUSSIA.**—The production of coal in Prussia for the quarter ending March 31st was, in metric tons:

	1899.	1900.	Changes.
Coal .....	23,229,834	25,579,122	I. 2,349,288
Brown coal (lignite) ... ..	6,699,928	8,174,924	I. 1,474,996
Total .....	29,929,762	33,754,046	I. 3,824,284

This year there were 269 collieries producing coal, and 389 mines or open workings, from which brown coal was taken.

**PROPOSED NEW RUSSIAN PIPE LINES.**—The "Petroleum Review" says that it is reported in St. Petersburg that a London banking firm is petitioning the Russian Ministry of Finance for permission to construct pipe lines from Moscow to Jaroslav, a distance of 252 versts, and from Rybinsk to St. Petersburg, a distance of 450 versts. It is proposed to use 8-in. pipes, the estimated cost of construction being 23,400 roubles per verst. Such a system of pipes, which would be capable of conveying 25,000,000 poods yearly on each route, would greatly facilitate the exports of petroleum.

**COAL CONTRACTS IN GERMANY.**—Respecting the deficiency in fuel, as to which German ironmasters complain so bitterly, that Government has not, says the London "Colliery Guardian," forbidden the export of coal and coke to other countries, and especially France; but it has enjoined the directions of the State collieries, when they enter into fresh contracts, to make sure that home consumers are supplied in preference to foreigners. With this object the State Colliery directions appear decided not to accept any new orders from France; and, as regards old customers, they strike a mean of the last three years' deliveries and subtract one-third, for arriving at the quantities that can be supplied in future. The contracts are to run for six months, or a year at the outside; and it is stipulated that strikes, mine accidents, deficiency of wagons and other similar causes shall constitute sufficient reason for delay or non-delivery. Some large French consumers of coal have already contracted with the German State Collieries for supplies for a year from July 1st.

NICKEL MINING IN NEW CALEDONIA.

The accompanying photographs, for which we are indebted to Mr. E. A. Weinberg of Noumea, illustrate some of the features of nickel mining as carried on in New Caledonia. The nickel ores of that island are found only in the serpentines, in irregular veins and fillings of the shattered surface rock. Although no special rules can be laid down for

through the veins at Mount Krapet. 5. The lines from Mount Poya to Mount Kopeto, with the rich mines belonging to Mr. Bernheim and the International Corporation (now the Nickel Corporation, Limited). Almost without exception, the mines are difficult of approach. 6. The line from Mount Koniambo to Mount Katapahic. The mining conditions are fully described in "The Mineral Industry," Volume VIII., from which this account is abstracted.



ORE DUMP AND WIRE TRAMWAY AT NICKEL MINE, NEW CALEDONIA.

these ore occurrences, the principal nickel mining centers follow specific lines, which can be traced along the spurs of the mountains. In this way six distinct mining areas have been established. 1. The great line, which for more than 100 km. (62 miles) runs northeast from the Mont d'Or to Nakety, and which includes the mines of Dumbea, Tontouta,

The ore consists of the hydrosilicate of nickel and magnesia, sometimes found absolutely pure, but more frequently associated with silicious gangue, red clay, or the fragments of decomposed serpentine. The average composition of nickel ore as it is being shipped at present to Europe, is represented by the following analysis (dried at 100° C.): SiO<sub>2</sub>,



A NICKEL MINE IN NEW CALEDONIA.

Ouenghi, and, above all, the celebrated district of Thio, the seat of the Societe le Nickel. 2. The line which runs from the bay of La Recontre to Thio, on the East Coast, and which has produced the mines of Ny, Brandy and Port-Bouquet. 3. The line from Nakety to Mount Arembou, which passes through the mines of Canala, Kouaoua and Mere. 4. The line from Mount Boa to Mount Adio, in the center of the island, known

42.0; NiO, 10.0; MgO, 22.0; Fe<sub>2</sub>O<sub>3</sub>, 10.5; Al<sub>2</sub>O<sub>3</sub>, 2.5; CaO, 1.0; H<sub>2</sub>O, 12.0; total, 100.

Wherever nickel ore is present, the surface indications are of such a striking nature that no special skill or intelligence is required to prospect for it. The ground is always covered with iron gravel, which itself is slightly nickeliferous, and fragments of serpentine rock are met with,

showing often plainly the traces of a saturation with nickel solution. All workings are open quarries, the length and depth of which vary with the different deposits, but in every case the life of a particular quarry is limited to a few years, when new ground must be opened out, and whatever installation has been made is shifted.

Success in nickel mining operations lies chiefly in transporting the ores down from the mountains to the seaboard cheaply. Aerial ropeways are used for bringing the bagged ore from the various quarries to stations alongside a tram line.

The mining operations consist mainly of pick and shovel work, assisted by an occasional shattering of the serpentine rock by powder. The veins vary from an inch to several feet, but operations are, as a rule, slow and tedious. With the convict labor employed at present on the nickel mines, the average production does not exceed 2 to 3 tons per month per man, though in exceptional cases it may average 7 to 8 tons per month.

European buyers generally pay about 75 centimes per 1 kg. of nickel contained in the ore (with a minimum of 7 per cent.) delivered in barges alongside the loading vessel. Freight by sailing vessels vary from 32 to 34s. per ton, to Glasgow, Havre, or German ports. Provided the minimum of 7 per cent. has to be maintained, it is doubtful whether the production will exceed 60,000 to 70,000 tons per annum, but with a lowering of the nickel contents, to say 5.5 per cent., the production could be more than doubled.

#### THE VALUE OF CHINESE MINING CONCESSIONS.

Written for the Engineering and Mining Journal by John A. Church.

We have lately been informed from various sources that Americans have secured large mining concessions from Korea and Russia and that China is equally willing to permit the foreigners to mine gold freely, of course on the basis of a royalty amounting to 25 and 30 per cent. of the gross value. It has not seemed to me credible that such schemes would be presented seriously to intelligent Americans, for it is rare indeed to find a mine that could support such a tax. The royalty, however, is but the beginning of expensive demands. The pay and support of officials and military men and the money composition for the thousand hindrances that can be thrown in the way of a struggling industry are matters that can be calculated in advance, but there is another source of expense which is not susceptible of calculation. That is the dishonesty of all hands, officials and workmen. The Chinese workman steals both for gain and because of a magpie disposition to take anything valued by another, whether it is worthless or not to himself. I have been annoyed for days by the loss of memoranda on loose bits of paper which, being guarded carefully by the workman for whose instruction they were made, were stolen by a fellow workman merely because they were something treasured.

It was my practice when mining in China to have the men's kits examined by a file of soldiers occasionally, and it was never done without making the most surprising discoveries. Bits of paper, a handful of nails, odds and ends of all kinds, were accumulated by men who laid themselves liable to 300 blows with a bamboo, or even loss of their heads in consequence. One part of the mine which I directed in Mongolia was in shales and there we would occasionally find a sheet of native silver 50 or 100 oz. in weight. I doubt if the mine owners ever secured more than one of them. They had the remarkable habit of discovering themselves only at night, when they would be removed bodily and divided among those in the secret. Our information would come only when some lumps of the metal were found in the kit of a miner too stupid to bank it promptly. One of these little bonanzas peeped out when the American foreman was present, and we got it. Our ore was stolen constantly, and the blaze of furnaces in which it was smelted would occasionally light up the distant sky.

Outside of our main gate was a row of forges at which the cheery blacksmiths worked openly all day making articles for the market, and every pound of the metal was stolen from my warehouses. The nails I took to that mine would build a village, and the supplies of all kinds stolen in the most open manner were immense in quantity. I had a Chinese of high rank and a magistrate who were charged especially with the duty of preventing all this. The high official lived near the gate, where all these forges were, and I have known materials to be brought in and paid for and immediately taken down to the official's house, passed through it to the outside world, brought in through the main gate again and resold to me. In one case 3,000 ft. of lumber was resold so often in this way that it appeared as 20,000 ft. on our books. I had 800 men, and with very few exceptions they were as bold a body of freebooters as ever plundered the helpless.

A noted robber of that region gathered a band of about 70 men with the avowed purpose of attacking our camp. I had 50 soldiers of the viceroy's army under a captain, and my military man came several times to concert measures for our safety. These attentions on the part of the robber attracted little notice until he came to the camp with his second in command and stayed for two nights in the captain's cabin.

As I read of these fine concessions that our countrymen are getting for mining great tracts of gold-bearing country I wonder how much of the product would get to the pockets of the concessionaires. It would be exactly as much as the interest of the officials permitted, and the calculation of that interest by the officials would open the eyes of the most sordid scoundrel in America. I examined one gold mine far above the Great Wall, and though it would be a good property in this country, I made up my mind that no enterprise of the kind could succeed unless the adventurers could find a more efficient thief preventer than I had.

My experience was by no means unique. The beginning of Chinese railroads was made while I was in that country, and the engineer in charge proposed to have the best system possible, but he was forced to give up the block system of running trains because the natives stole all the parts that lay above ground. They also stole nuts, bolts and fish-plates. It was difficult to make the American works that supplied my machinery understand the absolute thoroughness with which every

removable part must be boxed, and the night after my goods were landed at Tientsin the manhole covers for the boilers were stolen by a casual passer by.

I opened a mine, built a concentrating mill and a furnace. The Chinese ran the mill very well except that they did not look after losses closely enough. Their care of the furnace was very good, but no one I had would ever learn to make up a charge. In the mine they were very inefficient, and to the very end of my stay it was impossible to make them understand the difference between ore and waste and the necessity of keeping them apart. This was strange, because when they mine for themselves they are most exact about this. The truth is the Chinese are "chloriders." Work on a small scale they understand, but they are confused by the swing of large operations, and their confidence in the foreigner and ignorance of his methods leads them to expect him to transmute the trash they send out for ore into metal.

It is possible to pile up machinery, railroads and all other civilized things in China with great rapidity, but it will take a long time to change the mental condition of the people. If a magician desired to destroy this America of ours he could do it at one stroke by taking away the mental characteristics that make the American workman what he is and substituting for them the mental characteristics of the Chinese. With all our resources we would be bankrupt in six months.

I do not say that China will not improve and develop, and the development of 400,000,000 people will mean wealth for some one, but he who stakes his money on the expectation of transforming suddenly a B. C. barbarian into a twentieth century civilized man will be disappointed. There are parts of China, Korea and Siberia that in other hands would become important sources of gold production, but I do not believe it is possible to introduce American methods there and reap the natural profits.

#### RECENT DECISIONS AFFECTING THE MINING INDUSTRIES.

Specially Reported for the Engineering and Mining Journal.

**LESSEE OF OIL LANDS NOT COMPELLED TO PUT DOWN ADDITIONAL WELLS.**—A lessee of oil lands cannot, under any implied agreement, be compelled to put down a well on a certain tract of land—part of the premises—on penalty of forfeiture of the lease, except on proof of fraud in fact. It is not enough that, as against his judgment that it would not be profitable, the lessor, or experts, or the court, or all of them, have a different opinion. A lease is not terminated "when no longer profitable for the lessor" where the lease provided that it should continue so long as oil can be found or produced in paying quantities; such a phrase has reference to the operator, to be construed by his judgment when exercised in good faith.—*Young vs. Forest Oil Company* (45 Atlantic Reporter, 121), Supreme Court of Pennsylvania.

#### SCHEELITE IN NEW ZEALAND.

The "New Zealand Mines Record" gives the following account of the Golden Point Mine at Macrae's Flat, Otago, which is owned and worked by W. & G. Donaldson:

The property consists of 60 acres on line of reef. The reef is of a fairly flat nature, and its lie differs little from the country rock, which is schist. Its course is a few points north of east, and in thickness it averages about 4 ft. The reef is operated on level face at an elevation of 200 ft. above milling plant, to which it is connected by an aerial tramway of one span 900 ft. in length, and worked by gravitation. The mill consists of one Giant rock-breaker, 8 in. by 10 in., with receiving shoot, into which the ore from the mine is dumped, and gravitates over a grizzly or screen, which takes out the fine quartz, the rough passing on to the rock-breaker, which discharges into a bin capable of holding 150 tons, from which the ore feeders draw their supply to feed 10 head of 700-lb. stamps and one 5-ft. Huntington roller mill, from which it goes on to concentrators after having passed quicksilver tables. The whole machinery is driven by a 6-ft. Pelton water wheel under a head of 110 ft. The water is drawn from Deepdell Creek by a race 2 miles in length. There is also a lower race from same creek to supply the tables. The whole plant, races, etc., are valued at £8,000. The mine has been in operation for some years for the saving of gold, but it is only during the past year that any attempt was made to save the scheelite.

For the year ending December 31st, 1899, 2,000 tons of quartz were treated for gold, value £1,400, and 98 tons of scheelite were produced, assaying 67 to 69½ per cent. of tungstic acid. The scheelite is shipped from Dunedin to Hamburg, where it is sold by an agent, and prices have ranged from 20.3 to 20.5 marks per unit for 1,000 kgs. The production would have been much greater if there were sufficient concentrating appliances to keep the whole plant at work, and it is the intention of the owners to increase the concentrating appliances, so that 8,000 to 10,000 tons of stone can be treated each year.

The owners have had many inquiries for scheelite from Germany, France, England and America, and efforts have been made to contract for the mine's output for a period of years, but so far without avail, and one of the owners has gone to England to inquire into the whole question of the consumption and markets for the mineral scheelite.

**BOILER EXPLOSIONS IN FRANCE.**—According to a recent official report, the principal causes of boiler explosions in France are, in the order of their number, the corrosion of plates by bad water; low water, permitting overheating of plates; and defects in construction. Under the third head the chief defect is found in badly designed or insufficient internal bracing.

**PIG IRON PRODUCTION IN GERMANY.**—The production of pig iron in Germany in April was 680,159 tons, being 14,491 tons less than in March, but 13,534 tons more than in April, 1899. For the four months ending April 30th the output was: Foundry iron, 490,189; forge iron, 521,577; Bessemer pig, 152,111; Thomas (basic) pig, 1,490,151; total, 2,654,028 metric tons. This compares with a total of 2,658,443 tons in 1899, showing a decrease of 4,415 tons, or 0.16 per cent., this year.

MINING AT LEADVILLE.

By Our Special Correspondent.

Leadville takes high rank as a mining camp, not only on account of the wealth it has produced in the past twenty-one years, but from the diversity of mineral that is found within its area. Leadville combines gold, silver, copper, lead and manganese, and has now added bismuth to the list of values. The Leadville area is a field that geologists study with profit, and one that is never fully mastered.

In the early days when mineral was discovered close to the surface on Fryer, Iron and Carbondale hills, a quarryman from the East had as much show to strike ore as the most experienced miner in the country. The mineral usually laid in large masses and when encountered was easily mined. Millions of wealth were taken out in this haphazard fashion, and no thought given to scientific mining. When the surface diggings became exhausted it was necessary to sink deeper shafts to reach the large bodies of ore that undoubtedly underlaid the lime and porphyry. An impetus was given to this belief when Prof. S. F. Emmons proposed a distinct theory upon which to work.

When the fall in silver came in 1893 the attention of all was called to the possible existence of gold. The first to discover this in large quantities was the Ixex Mining Company, in the Little Jonny. This marked another era in Leadville mining. The history of the famous Little Jonny is well known, but it will not be amiss to mention in this article how this property is worked.

prospect work done last year was 8,400 ft. and 15,000 ft. of stoping. Taken as a whole, the underground workings will reach to nearly 45 miles. The company owns 150 acres of territory.

In addition to the shops mentioned, there is a complete laboratory where all the chemical and assay work is done.

The ore is loaded into cars by a tramway and hauled direct to the smelter, whether in Leadville, Denver or Pueblo, the Denver & Rio Grande Railway having constructed a branch from the main line at Leadville to the mine. The ore, therefore, is only handled once. The output averages 350 tons per day, consisting of silicious and sulphide ores. The value is not known, but supposed to net about \$15 or \$20 per ton.

THE OCCURRENCE OF VANADIUM, CHROMIUM AND TITANIUM IN PEATS.\*

By Charles Baskerville.

Attention has been called by Dr. W. F. Hillebrand to the comparatively wide-spread occurrence of vanadium in a large number of minerals and rocks. He states that "Hayes in 1875 reported its occurrence in a great variety of rocks and ores. Quoting from Thorpe's 'Dictionary of Chemistry,' it is said to be diffused with titanium through all primitive granite rocks (Dieulafait) and has been found by Deville in bauxite, rutile, and many other minerals, and by Bechi and others in the ashes of plants and in argillaceous limestones, schists and sands. . . . It is further



CONVICT LABORERS AT WORK IN A NICKEL MINE, NEW CALEDONIA.

The company being a close corporation, it is a difficult matter to give full details as to the work carried on underground. A look at the surface plant, however, will be interesting. It is one of the most complete plants in the country, and the main idea is centralization. Last year it required about \$40,000 to bring this idea into practical form, but it is estimated that the saving annually is about \$50,000. The central steam generating plant is at No. 3 shaft, where a battery of 12 boilers, 80-H. P. each, is located. This furnishes power to the whole plant. In case of accident or emergency, at No. 2 and No. 4 shafts are three and four boilers. All the boilers are connected with large steam pipes, so that power can be sent to the underground pumps by two distinct routes. Formerly it took 14 boilers to generate power; with the centralization it only takes 7 of the 12 boilers to supply steam. The air-compressor plant is located at No. 4 shaft, with a capacity of 24 drills. The dynamos have a power of 1,500 incandescents and the entire lighting of the plant, surface and underground, is controlled from this power room.

At 1,000 ft. in the shaft a stratum has been cut, 112 ft. high and 849 ft. long, with two large compound pumps installed; one a Knowles, the other a Jeanesville compound duplex. The water column is 14 in.

In connection with the surface plant there is a complete sawmill, which prepares all the timbers and lumber for the mine, also wedges. The yard has skid room for 10,000 logs. Centrally located is a large machine shop, a car-building shop, blacksmith and carpenter shops, all fully equipped with all the latest modern appliances.

The operations of the mine call for 5,000 logs per month, and 600 sets of timbers are used monthly. The average amount of water pumped is 550 gallons per minute. The number of men employed averages 450; wages for miners, \$3 per day; when sinking shafts, \$3.50, 8-hour shift. Working hours are generally 10 to a day's work. The

reported to comprise as  $V_2O_5$  from 0.02-0.07 per cent. of many French clays, 0.02-0.03 per cent. of some basalts, 0.24 per cent. of a coal of unknown origin, and 0.45 per cent. of one from Peru, amounting to 38.5 per cent. and 38.0 per cent. of the ash, and noted respectively by Mourlot and Torrico y Meca."

Roussel states that a basalt with a content of 0.707-2.378 per cent. of titanium contained 0.006-0.023 per cent. of vanadium. Gladstone, however, states that it does not occur in the volcanic dust of Vesuvius. Terrell found it in iron ores. Stolba also mentions its occurrence.

From the above the presence of vanadium could with reason be suspected in peat. In the hands of the writer were samples of peats from Hyde Swamps, one mile south of Pungo Lake, near the northern junction of Beaufort and Hyde counties, N. C. The approximate analyses of these peats gave:

Sample.	Water.	Volatile matter.	Fixed carbon.	Ash.
Peat I.....	73.67	16.16	9.72	0.45
Peat II.....	71.58	17.42	10.31	0.69
Peat III.....	76.01	14.19	9.32	0.48

The water was determined by taking a cube measuring about 8 cm. each way (from 700 to 800 gms.) and bringing to a constant weight by heating for a number of hours not higher than 105° C. An analysis, approximate, of this dried peat, gave the following results:

Sample.	Volatile matter.	Fixed carbon.	Ash.
Peat I.....	1.58	36.90	1.72
Peat II.....	1.35	36.20	2.46
Peat III.....	59.13	38.55	2.02

It was convenient to examine the ash of a large number of peats from

\*Paper read before the North Carolina Section of the American Chemical Society. Reprinted from the "Journal" of the Society, August, 1899.

this and other localities to ascertain the presence of titanium. We have found no statements regarding the presence of this element in these ashes, although such a surmise was logical. Neither does chemical literature, as far as we have been able to examine, give any mention of the occurrence of chromium in peats. Appended are the results of seeking for these elements in the samples mentioned above:

Sample.	Titanic oxide.	Chromium sesquioxide.	Vanadium pentoxide. Percentages in ash.
Peat I.....	0.490	0.0283	0.00107
Peat II.....	0.340	0.0343	0.0026
Peat III.....	0.491	0.0355	0.0031

In determining titanium the ash was decomposed according to the method of W. A. Noyes, namely, by fusion with sodium fluoride and potassium pyrosulphate. The melt was brought into solution with Dunnington's necessary precaution in mind, having from 5 to 10 per cent. of sulphuric acid present. Hydrogen dioxide was added according to Weller's well-known method and the titanium determined colorimetrically. All hydrofluoric acid was driven off in the fusion and the hydrogen dioxide was free from that acid as well. Hillebrand has shown the necessity for this. Chromium and vanadium were estimated according to the latest method of Hillebrand.

#### GEOLOGICAL INVESTIGATIONS IN WESTERN ONTARIO.

On June 1st the Ontario Government sent out 10 exploring and survey parties to the northern parts of Ontario, an appropriation of \$40,000 for this purpose having been ratified by the last legislative assembly. Much of the territory to be explored is now a blank on the maps and the combined reports of the surveys should add greatly to the fund of information regarding its resources. Each survey party is accompanied by a geologist, who is to examine carefully rock formations and explore for ores and economic minerals; also by a practical farmer, whose duties are to report on the value of arable land for settlers' use in the district traversed. All mineral samples, etc., collected by the geologists with the parties are to be sent to the Government assay office at Belleville—to which we are indebted for this information—for testing and examination as to commercial value. The work assigned to each group of survey parties is about as follows:

No. 1.—In charge of Mr. T. B. Speight, Toronto.—To survey an astronomical base line from near the 200th mile of Niven's boundary between Algoma and Nipissing, to extend easterly toward the inter-provincial boundary between Ontario and Quebec. The exploration will be made from the Abitibi River and Abitibi Lake northward toward the proposed base line, and also north of the base line for 20 or 25 miles toward James Bay. This group will consist of two survey parties. Area to be surveyed, 100 miles square.

No. 2, in charge of Mr. A. Niven, Haliburton.—To survey an astronomical base line starting from near the 200th mile of Niven's boundary between Algoma and Nipissing, and running due west 100 miles to the Missanabie River, and exploring the territory on either side, north and south, covering an area of 100 miles square. In this case also there will be two survey parties.

No. 3, under the direction of Mr. W. S. Davidson, Sarnia.—To explore down the River Kabinakagimi, or west branch of the Missanabie River, going in from at or near Grasset station on the Canadian Pacific Railway, down to the junction with the Massanabie River; thence down to Moose River, exploring on the easterly side over to the main Missanabie River, and on the west side about 20 miles inland.

No. 4, under the direction of Mr. William Galbraith, Bracebridge.—Starting from Jack Fish station on Lake Superior to explore to the head of Long Lake; thence down the Kenogami River, sometimes called English River, 200 miles to the Albany River, exploring 20 miles on either side thereof, and ascending any river which may run into the Kenogami River en route; thence down the Albany River to its mouth at Fort Albany, James Bay, exploring on the south side of the said river. The north side of the Albany is in the district of Keewatin.

No. 5, under the direction of Mr. J. M. Tiernan, Tilbury.—To start from the head of Lake Nipigon at its northeast corner, up the Ombabika River, northerly to the Albany River, exploring 20 miles on each side. To descend the Albany River 250 miles to the outlet of the Kenogami River, exploring on the southerly side, and ascending any rivers which run into the Albany. This party is to connect with party No. 4.

No. 6, under the direction of Mr. James Robertson, Glencoe.—To start from the northwest side of Lake Nipigon at Wabinoosh Bay, up Wabinoosh River and chain of lakes, across the height of land; thence down toward the Albany River and up the Albany River to Lake St. Joseph, and up Savant River to Savant Lake, exploring 20 miles on each side of said rivers; also descending the Albany River to connect with survey No. 5.

No. 7, under the direction of Mr. H. B. Proudfoot, Fort William West.—Going in from Dinorwic on the Canadian Pacific Railway district of Rainy River, and exploring north of Lake Minnetakie toward Lac Seul, or Lonely Lake, and Lake St. Joseph, down English River, which runs from Lake Minnetakie to Lac Seul; also along Root River, which runs between Lac Seul and Lake St. Joseph, exploring the country north of both the last mentioned lakes, and connecting with the explorations of party No. 6. Also to make a micrometer and track survey of Sturgeon Lake, where there is at the present time considerable mineral prospecting going on.

No. 8, under the direction of Mr. David Beatty, Parry Sound.—Will make explorations southwest of Lake Nipigon, west of Nipigon River, westerly to Dog Lake and north of Dog Lake, also go up Gull River from Lake Nipigon and round Black Sturgeon Lake.

No. 9, under the direction of Mr. T. R. Deacon, Rat Portage.—Will explore the country between Wabigoon and Rat Portage, north of the Canadian Pacific Railway, extending north to Lac Seul and English River, making a track and micrometer survey of any chains of lakes within this area and exploring the country thoroughly on either side of said track survey.

No. 10, under the direction of Messrs. Desmorest and Sylvester, Sudbury.—Will explore the country lying between Lake Temagami and the Montreal River on the east, and Niven's meridian line, between the districts of Nipissing and Algoma on the west. All accounts point to the existence of a large quantity of timber and a mineral belt in this region. Numerous lakes are reported in this territory, which is a blank on the map at the present time, very little being known of it.

#### THE YELLOW OCHER MINES OF THE CARTERSVILLE DISTRICT, GEORGIA.

Written for the Engineering and Mining Journal by Robert H. Couper.

The mining of ocher in this district has increased to such importance as to deserve notice. According to statistics at hand, the value of the product of these mines places them in a high rank among the ocher mines of the world.

The district covers about 12 square miles, extending north and south about 6 miles, and having a breadth of about 2 miles; its western boundary touches the eastern part of the corporate limits of Cartersville. It is in a belt of the Potsdam sandstone formation, and it includes a set of parallel ridges, 200 or 300 ft. in height above the surrounding country. The substratum is a white micaceous clay, the resemblance of which to the Potomac clays suggests a similar origin. On this is a stratum of massive quartzitic sandstone, the Potsdam, which occurs generally about 25 ft. thick. On the sandstone is a stratum of ochery clay, and above that is a bed of unstratified red clay, the subsoil of the district. In the ochery clay occur yellow ocher, manganese ore and specular iron ore. The origin of this stratum is not quite clear, and yet there is reason to suppose that it is an altered formation; that is to say, that it was originally limestone, and that the carbonate of lime has been displaced by hydrated ferric oxide and clay. At the Dobbins manganese mines there have been found in this stratum numerous fossils of a fungiform coral, showing that at least a part of the stratum was originally of organic origin. In its present state the stratum consists of clay mixed with a large proportion of iron peroxide and considerably impregnated with manganese dioxide; it is a dark-greenish yellow clay, and is somewhat laminated.

In this stratum the ocher has segregated and forms a seam which rests usually just on the bed rock of sandstone. This seam varies in quality and size. It sometimes contains an excess of clay, or it is darkened by a high percentage of manganese. It is generally from 3 to 8 ft. in thickness, and in one mine has been found 12 ft. thick.

The ground of the district has been much disturbed; the strata have been folded, and sometimes overthrown; also in some places the top of the fold has been sheared off, and the debris deposited on the slope of the fold; some of the best mines are found in this situation.

The ocher consists of about two-thirds ferric oxide, hydrated, and nearly one-third clay; it contains about 3 per cent. manganese dioxide. As might be inferred, it has very great body, and it also has great staining quality. It has been little used as a paint, though it has much to recommend it for that purpose. It has been devoted almost exclusively to the manufacture of linoleum, and of the five linoleum mills in this country four get their supply of ocher from the Cartersville District. A part of the product of the mines is exported to linoleum mills in Europe.

There are four mining companies in the district, and the capacity of their mills is about 7 tons daily each. The ocher is mined by underground work; it is washed, floated, dried, pulverized and packed for shipment.

**GOLD FROM MADAGASCAR.**—Included in the exports from Madagascar to France in 1899 were gold bullion valued at \$65,855 and gold dust, \$139,545; making a total of \$205,400, which compares with \$17,322 in 1898.

**IRON PRODUCTION IN BELGIUM.**—The total output of the Belgian blast furnaces in 1899 was: Foundry iron, 84,180; forge iron, 330,060; steel pig, 621,945; total, 1,036,185 metric tons. In 1898 the total was 982,748 tons, so that the increase last year was 53,437 tons, or 5.4 per cent. The production of wrought or puddled iron was 489,480 tons, an increase of 4,440 tons, or 0.9 per cent. The make of steel ingots and direct castings was 729,920 tons, against 653,130 tons in 1898, showing an increase of 76,790 tons, or 11.7 per cent. The production of finished steel in all forms was 621,020 tons, a gain of 53,292 tons, or 9.4 per cent.

**NAIL FACTORIES IN BELGIUM.**—United States Consul G. W. Roosevelt, at Brussels, reports that the nail industry in Belgium is in bad condition. Prices for raw materials have of late risen, with no proportionate increase in the price for the manufactured article. There are in Belgium, exclusive of two small works situated at Hodimont and Luxembourg, nine nail factories, six of which are at Fontaine-l'Éveque, one at Brussels, one at Marchienne, and one at Gentbrugge; but, owing to American, German and French competition, Belgian manufacturers admit their inability to place their surplus production on foreign markets heretofore exclusively controlled by them. The crisis started about two years ago when American goods began to supplant the Belgian article upon the various European markets. Manufacturers also admit difficulty in competing against the German nail syndicate, which comprises 86 nail works, and which is reported as supplying home orders at high rates and placing its overproduction for exportation at whatever price it can get. The German manufacturer is favored by an export premium. At Fontaine-l'Éveque, the annual production of nails amounts to 18,000 tons, 9,000 tons of which are consumed in the country, the surplus being held for exportation. Belgian manufacturers realize that markets are constantly escaping them; that the tonnage of exportation is yearly diminishing, and that they will be obliged to curtail production. They regard with especial apprehension the progress made on foreign markets by American manufacturers during the past few years.

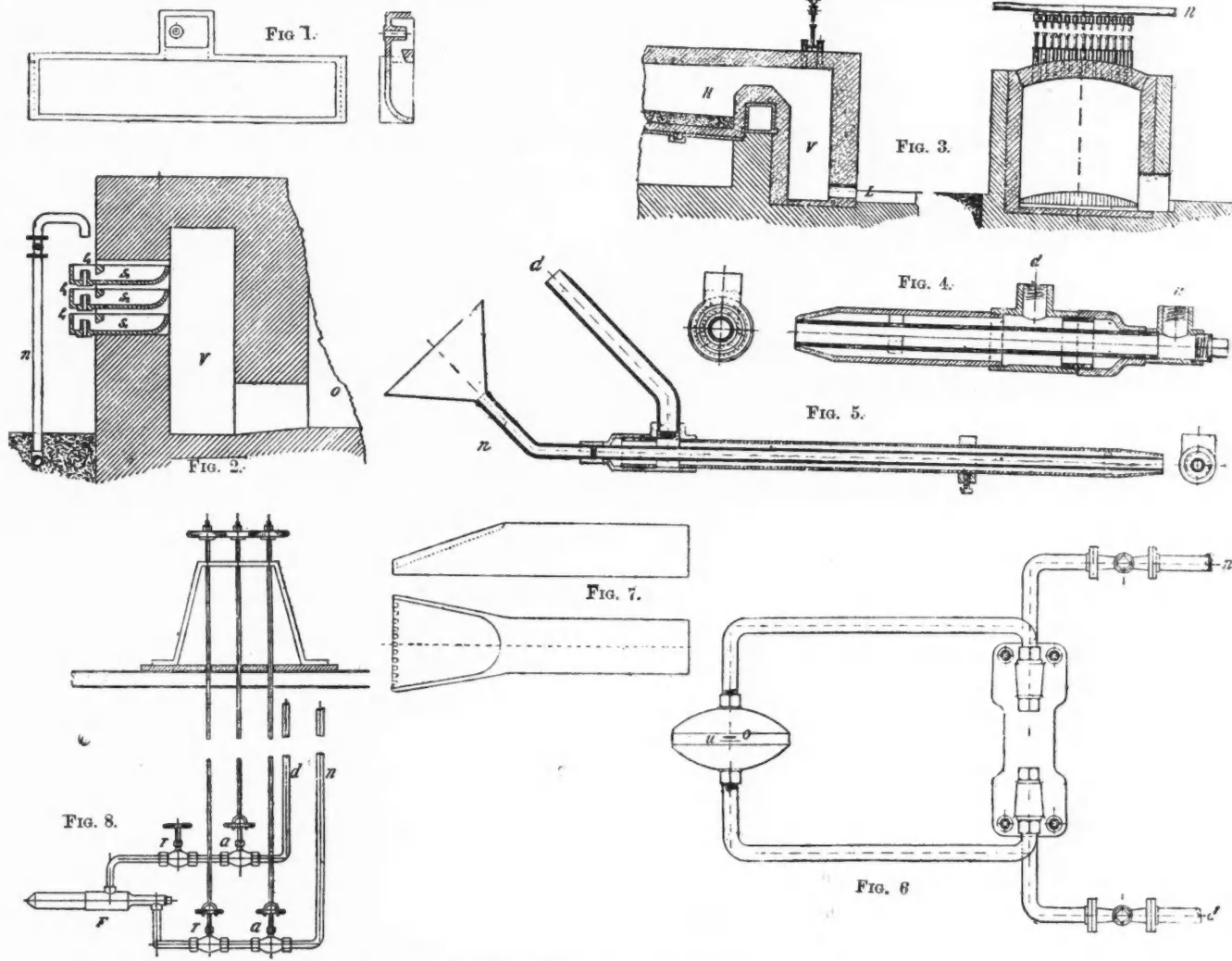


THE USE OF OIL IN METALLURGICAL FURNACES IN RUSSIA.\*

The employment of petroleum fuel for boilers has been practiced in Russia for some time; and for several years all the steamers plying on the Caspian Sea and the Volga, as well as the locomotives on some of the railways, and the petroleum distillers of Baku, have used liquid fuel. More recently attempts have been made to extend its sphere of usefulness to metallurgical furnaces; and, by reason of the great progress made in the Russian iron industry during the past few years, coupled with the enhanced price of fuel, petroleum has attained an important position in this respect. Some Russian smelting works use no solid fuel at all, petroleum being exclusively employed; and petroleum firing is used both for open-hearth and crucible steel furnaces, as well as in puddling and other furnaces, ovens for drying moulds, cementing furnaces, preliminary heaters, smith fires, kilns for baking clay and bricks—in fact, this oil has become a valuable fuel in all metallurgical operations, except blast furnaces, for which solid fuel is essential to the necessary loosening of the columnar charge.

Russian crude oil is mostly distilled at the place of production, only about 10 per cent. of the whole being sold in an unrefined state. The

manner that the brickwork fits tight against them at the side, while between each pair there is left an open space of carefully calculated area through which the necessary amount of air to maintain combustion is supplied. The oil fuel (residuum) is contained in a raised wrought iron tank holding several hundred gallons and is delivered through a pipe into the upper pan, the overflow from which runs down into the next, and so through the whole series, all that is necessary being to regulate the delivery by a tap so that the pans are all kept full without running over. This method is the oldest and simplest, though least economical form. It is nevertheless largely used and is, in fact, indispensable where gradually increasing temperatures are required. Fig. 2 shows the method applied to kilns for burning clay, lime or bricks, this type being in actual use in Russia. The only cases where this system is advantageous are where no very great heat is needed though very high temperatures can be obtained, particularly when the admitted air is heated; and as a matter of fact, this method is used for producing crucible steel in Nobel furnaces. It is also suitable for drying-ovens for shaped moulds, small copper-smelting furnaces and smelting other readily fusible metals in crucibles. To start the fire, the pans are filled with oil and a few lighted shavings



PETROLEUM BURNING IN RUSSIAN METALLURGICAL FURNACES.

usual products from 100 parts of crude oil are: 19.4 per cent. of lamp oil; 2.1 per cent. of lubricating oil; residuum 49.9 per cent.; other distillation products, 0.3 per cent. The residuum (also known as astatki or masut) constitutes about one-half of the total products, and this it is which recently proved so valuable as fuel in Russian smelting works.

Astatki has the specific gravity 0.95, a calorific value of 11,000 calories, and is capable, both theoretically and in practice, of replacing twice its own weight of good lignite. The cost in Baku is about \$2.50 per ton, but, in consequence of the long haul, the price in Moscow is as high as \$8.50, notwithstanding which this fuel is used to advantage.

Petroleum fuel sets its seal upon the works where it is used; the chimneys are smokeless; there is neither soot nor ash; no firebars or generators are required; and, moreover, there is no waste of fuel, the latter being conveyed to the furnace through the pipes; combustion is almost theoretically perfect, and—a particular advantage where labor is dear—the attendance is of the simplest and cheapest character. The methods of burning the fuel are varied, and improvements are being continually introduced. These methods fall into three groups: 1. Pan firing; 2. Drop firing; 3. Forsunka, or spray firing.

In pan firing a number of rectangular cast iron pans (Fig. 1) are mounted one above another in a hole in the furnace wall, in such a

are placed in the air-holes, whereupon the oil soon begins to burn. Until the furnace is hot a deposit of soot is formed and smoke issues from the flue, but the temperature is soon high enough to cause these symptoms to disappear. The imperfect combustion at the start entails an increased air supply, and the difficulties in the way of regulating this form the weak point in the system. The remedy is afforded by using a perforated air-door, the apertures of which can be increased or diminished in size by moving a slide.

Drop firing is a considerable advance on the previous method, and is more largely employed. The oil in this case (Fig. 3) is discharged in drops, or in a very fine stream, from a number of jets arranged in a row or from a perforated gutter, at such a height that the descending oil becomes intimately mixed with air, and thereby burns thoroughly, rapidly producing a high temperature with less waste than in pan firing. Jets are the best, since each small tube can be fitted with a valve to regulate the delivery, whereas in the case of a perforated gutter the apertures can only be enlarged by filing, but not diminished; besides, the holes are very likely to choke up. The most successful results with this system are obtained in welding furnaces, stoves and brick kilns. In the newly-erected Volga steel works at Saratov, the method has also been applied to a preliminary heater for the crucibles used in making crucible steel, and is found to answer satisfactorily.

The height of fall for the oil fuel is regulated according to the quantity and to the temperature desired; in small furnaces a 40 in. fall is

\*Abstract of article in "Stahl und Eisen." See "Engineering and Mining Journal," October 14th, 21st and 28th, 1899.

given, while for large ones the distance is increased to 80 in. The air for supporting combustion either follows the same course as the oil, and enters the furnace on either side of the gutter or jets, or else is directed upward to meet the falling drops of oil. In the former case the flame naturally extends further into the furnace than in the latter. To start the fire some wood is kindled in the combustion chamber, and the oil supply gradually turned on. The air supply is reduced to a minimum, and is not increased until the walls of the chamber have become sufficiently hot. When the fire is in full swing the falling oil ignites during its descent, and furnishes a long flame. This method possesses the advantage over all others of not requiring any attention; once the oil supply has been regulated, the fire need not be looked after again.

The systems named possess in common the characteristic that the oil supply is delivered by gravitation through pipes from a tank on a higher level, and therefore differ from the third type, in that in the latter the oil cannot be delivered direct into the combustion chamber, but must first be converted into gas in a separate vaporizing chamber, which serves the same purpose as the hearth in firing with solid fuel. In calculating the dimensions of a furnace for oil fuel, the starting point is the quantity of oil to be consumed per unit of time. From this is calculated the volume of air necessary, and the diameter of the air orifice—the amounts of oil and air then giving the volume of gas produced and consequently the dimensions of the combustion chamber.

The most widely used method of oil firing is the "forsunka" or atomizer (spray burner) Figs. 4-8. The reduction of the oil to the condition of spray was originally effected by steam, but at present compressed air is often employed. The burner consists of two concentric tubes, the inner one being usually the oil pipe, while the outer tube is used to convey the steam or compressed air, which impinges on the oil issuing from the inner pipe and sprays it, thus bringing about a very intimate mixture of oil and air. In this case the intermediate stage of gasification is omitted and the combustion chamber is one with the furnace itself. In addition to simplicity of construction, the forsunka system has the advantage that the length of the flame can be controlled, the supply of fuel regulated and a wide range of temperature can be attained. At first the tubular form of forsunka burner (Fig. 4) was generally used for boilers; but this burner gives a conical flame and is now being replaced by lenticular burners provided with two horizontal, longitudinal slits, the upper one discharging the oil and the lower one delivering a current of steam, an arrangement giving a flat, broad flame, of any convenient length (Fig. 6). As a rule, the forsunka and the terminal lengths of the steam and oil pipes are mounted on a swing bracket which at the same time connects them with the remainder of their respective supply pipes. To shut off the supply, all that is necessary is to turn the forsunka back through an angle of 90°, whereupon the connecting taps in the swing bracket are automatically closed. This withdrawal of the burner out of the hot firebox protects it from damage by the great heat in that chamber. A similar forsunka, though not working on hinges, is that used for heating welding furnaces (Fig. 7). Here the oil is delivered so as to flow down the inclined top surface of the burner, and on reaching the bottom of the slope, is caught up and sprayed by the compressed air discharged through a narrow underlying slit.

When it becomes a question of uniformly heating a large chamber, choice is made of the tubular forsunka with spiral jet, wherein the steam or compressed air receives a whirling motion and the flame takes the shape of a cone. Tubular forsunkas are used in all kinds of smelting furnaces for the production of forged iron as well as for puddling furnaces and open-hearth steel furnaces, and a couple of years ago the first crucible steel furnace was fitted with these burners. The smelting furnaces are constructed on the same lines as the Siemens regenerative furnaces for heating with coal gas. The older Martin (open-hearth) furnaces have four generator chambers, the two outer ones being heated alternately with the oil fuel, while the inner pair serve as air-heaters. The height of the burner is an important feature, since the oil must be delivered just above the level of the brick checker-work. The oil is gasified in the chamber, a small portion also burning therein, and the gas enters the furnace at a somewhat acute angle, and is there mixed with the heated air. A regulator rod extends from each forsunka burner to the service platform where the admission of fuel can be easily controlled by turning a small hand-wheel (Fig. 8).

A few years back attempts were made to blow oil direct into the smelting furnace, and the results were so favorable that this new system found immediate application. Four 15-ton Martin furnaces fired on this plan are in use at the works of the Moscow Steel Goods Manufacturing Company. The method of construction is exceedingly simple, the furnace having only two air-heating chambers and an arched roof. Five burners are provided, two at each end of the arch, these being worked alternately, while the fifth is in the center and works continuously, there being always three burners in action throughout. Connection between the burners and the steam pipe is established by means of metal piping. To throw a set of burners out of action the service pipes are closed and the burners turned on one side, the other two being then set going. In the meantime the central burner is merely turned in the direction of the exhaust. To prevent the burners being melted by the heat, they are surrounded by cooling jackets built in the arch and containing a circulating current of water.

To start the forsunka burners the steam and oil-pipes are opened a little way, and a lighted rag soaked in petroleum is held on a wire close to the jet of the burner for about 15 minutes, after which time the forsunka will burn without further assistance. As already mentioned, steam or compressed air is employed to spray the oil. For boilers steam alone is used, as is also frequently the case in other instances where the short distance of the burner from a steam boiler renders this course possible. Owing, however, to the extreme cold prevailing in Russia during the winter months, the loss of steam by condensation is so great even in short pipes that compressed air is coming more and more into use, especially where electric motive

power is available; and this method also obviates the risk of delays arising from leaky steam pipes. On account of the suspension of river traffic in winter, the Volga being closed by frost, users of oil fuel have to secure their supplies in the summer, and are consequently obliged to erect large storage tanks, made of strong sheet iron, and holding 300 to 400 tank-wagon loads. The storage tanks are fitted with pumps for filling the small tanks at the works every day. To lessen the fire risk occasioned by storing large quantities of oil, ironmasters only buy residuum with a flashing point above 120° C.; but as the demand causes the oil merchants to frequently adulterate the residuum with crude oil, which may lower the flashing point to about 80° C., it is necessary for the purchaser to test every parcel.

The expense of installing oil fuel at steel works containing two Martin furnaces, one crucible steel furnace, with heating-upt furnaces, two forging furnaces, four heaters, several mold-drying ovens and brick kilns, a few smithy fires, and a boiler-house with eleven boilers, was 27,000 roubles (about \$21,000), of which sum about 15,000 roubles was the cost of the storage tanks.

#### MINERAL PRODUCTION OF BRITISH COLUMBIA.

The report of the Minister of Mines of British Columbia for 1899, which has just been issued, gives much interesting information as to the mines and mining industry. From its statements we take the following table, showing the metal production of the Province last year, as compared with that of 1898:

	1898.		1899.		Changes, Values.
	Quantity.	Value.	Quantity.	Value.	
Placer gold, oz.....	32,167	\$643,346	67,245	\$1,344,900	I. \$701,554
Lode gold, oz.....	110,061	2,201,217	138,315	2,857,573	I. 656,356
Total gold, oz.....	142,228	\$2,844,563	205,560	\$4,202,473	I. \$1,357,910
Silver, oz.....	4,292,401	2,375,841	2,939,413	1,663,708	D. 712,133
Copper, lbs.....	7,271,678	874,781	7,722,591	1,351,453	I. 476,672
Lead, lbs.....	31,693,559	1,077,581	21,862,436	878,870	D. 198,711
Total values.....		\$7,172,766		\$8,096,504	I. \$923,738

The notable features of this statement are the heavy falling off in the production of the silver-lead mines; the increase in copper and lode gold, and the very large gain in placer gold. The last-named increase came in large degree from hydraulic mining, but chiefly from the placers of the Cassiar country and the newly opened Atlin District. There was an increase in lode gold from the West Kootenay Division, and a smaller one in the Coast districts, East Kootenay showing a reduction in output.

In addition to the metals given above, there was a production of 55 oz. platinum from the Similkameen Division. It is believed that this could be increased if miners were aware of the high value of the metal, and could distinguish it when found.

There were 2,000 tons of iron ore mined, part near Kamloops and part on Texada Island. This was all used for flux.

The production of coal and coke for four years past has been as below, in long tons of 2,240 lbs.:

	—Coal—		—Coke—	
	Tons.	Value.	Tons.	Value.
1899.....	1,294,132	\$3,882,396	34,251	\$171,255
1898.....	1,135,865	3,407,595	35,000	175,000
1897.....	882,854	2,648,562	17,831	89,155
1896.....	896,222	2,688,666	1,565	7,825

The coal output, which began to decrease slowly from 1891, reached a comparatively low point in 1897, but then took an upward turn. In 1898 it was the largest ever reported up to that date, exceeding the output of 1891; and in 1899 there was another large increase. Coke making first began in 1896, and is now a well-established industry.

The other products included brick and building stone, the former being made chiefly in the neighborhood of some of the coal mines.

The total value of the mineral production of British Columbia in 1899, including all the products named above, was \$12,356,555; which compares with \$10,906,861 in 1898, and \$10,455,268 in 1897.

#### THE CROWN POINT-ONTARIO SUIT IN UTAH.

By Our Special Correspondent.

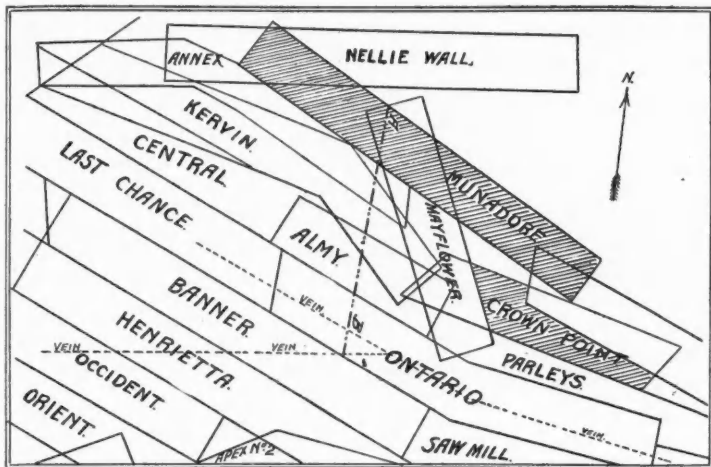
On June 5th, at Salt Lake City, Utah, in the United States District Court, Judge Moses Hallett presiding, the trespass suit of the Crown Point praying for damages of \$1,985,750, for ore mined by the Ontario in Crown Point Territory, was begun. In the original complaint, Crown Point claimed title to and ownership in all ore mined from the Ontario vein as it passed on its dip through the Crown Point and Munadore lode claims, but in the trial no claim for damages was maintained for trespass so far as concerns the Crown Point claim, and only for a fractional part of the Munadore claim.

The accompanying sketch-map will aid in making clear the status of the main features at issue. The plaintiff owns the Crown Point and Munadore lode claims, which are entirely surrounded by Ontario's holdings. The main profit-paying Ontario vein at the surface passes through the east end line and continues westerly through the Ontario claim till it reaches a point about 300 ft. east of the west end line, when it bends southerly, passing out of the side line into the Banner claim, which belongs to the Ontario Company, as indicated by the broken line. The defendant avers that there is another vein—a branch of the main vein—which continues west, passing out of the west end line into the Last Chance claim; that the two branches come together and unite, forming one vein at a depth of 300 or 500 ft.; thus fulfilling the conditions essential to give the defendant company the extra-lateral rights to follow the vein in its dip beyond the side line between vertical parallel planes passing through the end lines.

From this explanation it is apparent that the dip of the Ontario vein is to the north. In its exploration, the 1,300 and 1,500-levels—Ontario has no 1,400-level—traverse Munadore ground. The contention made

by Crown Point is that all ore mined in Munadore territory, from that part of the Ontario vein west of the line drawn north from the point where the main Ontario vein passes out of the side line and parallel to Ontario's end lines, or a vertical plane passing through this line—which throughout the trial was spoken of as the line A B and is so indicated in the diagram. The defendant admits the correctness of this contention under the rulings of the court, provided it is not demonstrated that an arm of the Ontario vein passes out of the Ontario claim through the west end line, as marked by the dotted line, and that in depth the two branches unite, forming a compact, strong ledge. Assays made by the plaintiff from croppings taken from this west branch vein gave fully as high values as the croppings from the east, or any portion of the vein, for near the apex the Ontario vein nowhere carries values of moment.

The weight of evidence was in favor of the vein passing out of the Ontario claim through the south side line, thus, under the law of apex, giving title to the Crown Point to all ore in Munadore territory west of the line A B. Most of the time for 5 days was taken up by evidence pro and con, tending to show the ore tonnage mined in that region and its value, or the dearth of ore and its lack of value. In this there is a wide discrepancy, even among those championing the same side; one of the plaintiff's attorneys affirming that the gross value of the ore tonnage mined from this region is fully \$1,500,000, while another maintained that the same total is \$800,000, and, naturally, the minimum valuations—\$8,000 to \$30,000 for the same ore tonnage—were affixed by those for the defendant. Drawings of vertical sections through the workings, published in the Ontario annual reports, indicate that in this part of Munadore ground a far greater ore tonnage was mined than defendant admits, and there is a like opposition of views concerning the grade of ore; plaintiff affirming the belief that the bulk was high-



ONTARIO—CROWN POINT CLAIMS.

grade smelting rock, and defendant pronouncing the bulk of what little ore there was to have been second class or milling stuff.

Immediately prior to the commencement of the trial defendant asked for a further continuance for the purpose of more fully demonstrating the extension of the branch of the Ontario vein passing out of Ontario's west end line and for other minor reasons. This request was disallowed, the court holding that defendant had had ample time and opportunity for all needed exploratory work and other preparation for this suit. The progress of the trial showed more evidences of lack of preparation on defendant's part.

Monday, June 11th, was devoted to the argument, each side being allowed 3 hours. At 5 o'clock Judge Hallett charged the jury, the charge covering the usual points in such cases. One charge asked for by the defendant was to the effect, if it was apparent as early as 1890 or 1891 that the owner of Munadore knew defendant was mining in Munadore ground and by reasonable care would have discovered the trespass then, plaintiff cannot recover for ore extracted prior to February 7th, 1895, thus sustaining the bar by limitation set up by defendant. The next afternoon the jury came into court for information and desired to have the testimony of several witnesses read as to the amount of ore mined in Munadore ground in 1895, 1896 and 1897; also the total tonnage and value of all ore mined by Ontario in these years. The latter are 30,550 tons in 1895, 30,270 tons in 1896, 23,180 tons in 1897, the values being \$879,000, \$776,853 and \$838,183 respectively. The jury then retired. On Wednesday, just before the noon hour, Judge Hallett called the jury into the court room. He urged the importance of reaching an agreement, that the trial had been a long one, that each side had been to considerable expense, that the suit has been pending for 5 years and ought to be decided in some way by this jury at this time. In closing, again emphasizing the desirability of a verdict, the court said, a wrong conclusion is better than none. When the jury retired counsel for each side took exception to these last instructions.

Shortly before 4 o'clock on Wednesday the jury notified the court that a verdict was reached. It was for the plaintiff and the amount was \$32,092. Later it was learned that more than 20 ballots were taken and several jurymen admitted that had it not been for the last instructions of the court no agreement could have been reached. One jurymen was in favor of \$500,000 and another thought \$100 ample. Sixty days were allowed for filing bills of exception and motion for a new trial. Ontario folk seem well content with the outcome and Crown Point are disappointed, though it is quite probable that there will not be a second trial.

THE NEW ERA ELECTRIC DRILL.

The accompanying illustration shows an electric drill which is manufactured by the New Era Electric Drill Company, of Denver, Colo., and is now being tried in some Colorado mines. The drill is of the reciprocating type, motion being given to it by a revolving shaft run at a high speed. The drill guide is circular and the operation is similar to that of a piston. The motor is enclosed in a box, which is dust and moisture proof, and which can, of course, be operated by electricity from any source available. Motor and drill are connected by a flexible shaft, a small starter at the rear end of the drill being provided, which gives the operator instant control in starting and stopping. The flexible shaft imparts motion to beveled gearing at the end of the driving axle of the drill; and on the opposite side of this axle is a gear which drives the flywheel, the latter being so geared that the flywheel makes 1½ revolutions to each revolution of the shaft. The driving axle passes through the crosshead of the drill, the rear end of the crosshead containing a peculiarly shaped slot, so contrived that a one-fourth forward



THE NEW ERA ELECTRIC DRILL.

movement of the axle crank gives the full forward striking blow. The piston-shaped guide is forward of the crosshead.

Two buffer springs gives the piston recoiling power, one of them being located on the inside of the front end of the crosshead and the other fitting snugly against its outer front end. By means of these springs the drill is prevented from striking a rigid blow. Another feature is the rotation of the drill bit. Two rabbeted cases contain the pawls; one case rotates in the piston guide on its backward movement and the other holds the piston when rotated and imparts to the latter a direct, straight blow, never permitting the bit to strike the rock a glancing blow. The steel is held in chuck by a novel one-nut clamp. The main clamp of the drill is held by one bolt, and by loosening one nut the drill is placed on a perfect swivel. A feature of the clamp is its side motion, by which, when a hole is started, the clamp proper need not be loosened till the hole is finished, as the side movement for changing bits is readily made. The machine is simple in construction and strikes a blow equal to about 200 lbs., delivering from 500 to 700 blows per minute.

The results obtained with this drill will be watched with much interest by mining men.

THE WASTEFULNESS OF CHIMNEY DRAFT.—In a recent discussion of the question of the various methods for the utilization of waste heat, the "Engineer" considers among other features the wastefulness of the usual method of producing draft by the ascent of heated air in a chimney. Boiler efficiency varies from 60 per cent. in a bad boiler to 80 per cent. in a very good one. The difference may be said, without greatly stretching the truth, to go up the chimney. It is not to be disputed that much of the waste heat might be caught and utilized; but there are reasons why it is not so caught. In the first place, the gases must be hot when they go into the chimney, or there will not be a draft. As a matter of fact a draft got in this way is the most expensive possible, except by a steam jet in the chimney. A fan can be run for about one-tenth of the power represented by the waste heat required to command a good draft. A tall chimney will cost very much more than will a fan plant. But the fan is not used and the chimney is, largely because it is essential to discharge the products of combustion high up in the air over the roofs of surrounding houses. This necessity must be taken into account in so far as factories are concerned, yet in most cases a chimneystack 100 ft. high would be sufficient, because with a fan combustion could be more easily controlled than is possible with a chimney to prevent the giving off of smoke.

## MINERAL PRODUCTION OF QUEBEC.

From the recently issued report of Mr. J. Obalski, inspector of mines of Quebec, we obtain the figures given in the following table, which show the mineral production of the Province in 1899 and its value. The third column shows the number of men employed in each branch of the mining industry:

	Quantity.	Value.	No. Men.
Gold, ounces .....	272	\$4,916	80
Bog iron ore, long tons.....	20,000	40,000	800
Ocher (calcined), short tons.....	1,430	14,300	50
Chrome ore, long tons.....	1,768	20,867	130
Copper ore, low grade, long tons.....	38,928	157,062	340
Copper ore, high grade, long tons.....	100	5,000	10
Galena and blende, long tons.....	350	12,250	10
Asbestos, short tons.....	15,571	581,667	900
Asbestos, short tons.....	7,695	17,069	...
Graphite, prepared, short tons.....	60	5,100	10
Phosphate, short tons.....	1,275	9,157	...
Mica, trimmed, short tons.....	331	108,063	500
Mica, rough, short tons.....	240	28,800	...
Feldspar, short tons.....	3,000	7,500	20
Sulphate of baryta, short tons.....	416	2,912	5
Slate, short tons.....	2,263	30,119	75
Flagstones, sq. yds. ....	4,000	3,500	9
Cement, bbls. ....	19,453	31,130	50
Water-lime, bbls. ....	900	1,080	60
Granite, ....	.....	12,780	.....
Totals .....	.....	\$1,093,272	2,999

There was no commercial production of petroleum, but in the Gaspé Basin several companies are operating and some oil is being pumped. A pipe line is under construction from the wells to the point where refining works are to be constructed.

In addition to the figures given above Mr. Obalski estimates the production of lime at 1,000,000 bushels, value \$140,000; bricks, 120,000,000, value \$600,000; building stone, value \$250,000. The number of men employed in making lime was 250; in brickyards, 1,200, and in stone quarries and stone dressing, 350. This brings the total values up to \$2,083,272, and the number of men employed to 4,800. The average time worked, taking the whole mineral industry, was 8 months in the year.

The metallurgical production consisted of 7,093 long tons of charcoal pig iron, valued at \$141,860. In the blast furnaces there were used 2,524 tons of limestone as flux, and 951,510 bus. of charcoal as fuel. There are two furnaces in blast, at Drummondville and Radnor.

Adding the price of the pig iron, we find that the total value of the mineral products of Quebec in 1899 was \$2,225,132, the prices being estimated at the mine or the nearest shipping point.

## MINING IN THE YUKON.

(By Our Special Correspondent.)

It will be of interest to describe how claims were worked in the Yukon country at first, and the improvements which have been made since. A few words about the nature of the soil might not be out of place. This country puzzles old miners, and they come from all the known mining camps of the world. Their theories as to how the gold was deposited here do not seem to work. The saying, "Gold is where you find it," should have been made especially for the Yukon District.

In the Bonanza and Eldorado, which are the richest creeks in the Klondike, relatively to their size, the depth of the earth, on the bed-rock, ranges from 15 to 25 ft. On Dominion Creek, which will give one-fifth (i.e., \$4,000,000) of the whole production of gold of this year, the depth of earth is at least double that. On the surface of the ground everywhere is found the muck, a fine earth, which is a humus. It is a fine, light dust when dry. It is harder to thaw out by means of fire than gravel.

The ground is frozen everywhere. It has been so since the glacial period, the geologists say. The sun in summer will thaw only a few inches. A number of shafts, 100 ft. and more deep, have met with only frozen ground. Under the muck lies the gravel in which the gold is found, if any is to be found. The stones of this gravel vary much in size and are sometimes rounded by water, or of a shady nature, with worn-out edges, and the earth is sticky and of a light-brown, yellowish or sometimes greenish color.

The bed-rock is often found to be a micaceous schist, blueish and soft enough to be worked with the pick. In other instances it is formed of harder rock, but cracked and loosened, the pieces being easily removed on the surface.

On the rich claims great improvements have been made in the way of taking the gold out. The method first used, and still resorted to by owners of poor claims and by prospectors, consists in building a fire, usually at night, and taking out the earth thus thawed, repeating the operation till the bed-rock is reached. The pick is not of any use in the hard, frozen gravel. It helps in the muck, but it has to be sharpened often by the blacksmith, who is not always handy and whose charges are always high in this country. The shaft is usually 4 by 6 ft. It has to be timbered so as to prevent the walls from falling down by pieces, as the earth thaws out by the effect of the fire and of the weather in summer.

When the bed-rock is reached, if the pay streak has not been found at the bottom of the shaft, drifting is started on both sides of it, at right angles with the direction of the valley of the creek, in order to locate the auriferous gravel. The drifts are not timbered. The frozen ground will not thaw out much if the fire is covered with green wood in such a way as to throw the heat toward the part to be thawed. Heated boulders are used with advantage, as they will not have a tendency to make the top of the drift thaw out and fall.

When a shaft is more than 50 ft. deep, wood will not burn for want of draft; then heated boulders are used. A man will throw earth with a shovel out of a shaft which is as deep as 8 or 9 ft., but not more. Then the windlass worked by hand power is used. It is slow and tedious work, especially as the shaft gets deeper.

London capitalists, it is stated, nearly invested \$1,000,000 in a vein which was found at the last minute to be salted. Eight miles above Dawson there is a large ledge formation along the Yukon, visible from the river. It has been repeatedly located and often reported to be very rich. It contains graphite, copper, gold, lead, etc. This winter a miner went to London with samples which assayed from \$200 to \$260 to the ton, and it took him but a short time to form a company of \$1,000,000. But, to satisfy the stockholders before the final papers were drawn, Capt. Cuthbertson was cabled to examine the property. He took samples which assayed high in gold. This puzzled him, as the ore looked almost barren. The result showed the presence of chloride of gold in the powder. Capt. Cuthbertson says: "Salting rock with chloride of gold was not new to me, but finding it absorbed in the dynamite was new to me, and I hold some of the plugs now with which I can in a few seconds, with a very small quantity, gold plate my knife blade." The trick of using chloride of gold is, I hear, an old dodge in salting mines in California.

The census which was taken in April gives to Dawson a population of 5,404 souls, an increase of over 500 in 8 months. There are 3,361 Americans and 1,701 British; all the other nationalities give 303. The number of women is 646 and children 242.

The whole Yukon territory contains 9,534 Americans, 4,555 British and, in all, 16,107 souls, not including 258 Indians. The Government in Ottawa may find that there are enough voters to grant the miners representation in the Council here or perhaps in Ottawa.

## NOTES ON THE ELMORE CONCENTRATION PROCESS.\*

The essential claims of the patentee are as follows: 1. A process for separating the metallic from the rocky constituents of ore, by mixing the pulverized ore first with water in considerable quantity, then adding to the mixture an oil which adheres to the metallic constituents, but not to the wet rocky constituents, allowing the water carrying the rocky material to subside, while the oil carrying metallic constituents floats above, and separating the oil from these constituents. The oil used is the thick tarry residue of mineral oil, called "residuum," after some of the more volatile constituents have been distilled off.

2. For separating metallic from rocky constituents of ore apparatus comprising horizontally revolving helically-ribbed mixing drums, subsidence vessels, a centrifugal drum for separating the oil, a tank provided with agitators, and a second centrifugal machine for separating the water, arranged and operated substantially as described in the specifications.

The process, as practiced at Dolgelly, Wales, consists in crushing the low-grade copper rocks by a Comet breaker, followed by smaller ordinary jaw breakers, passing the material to rollers (crushing wet), and the product of these to 5-ft. Huntington mills provided with No. 6 (jabbed) needle-mesh screens (the fines produced by the Comet are screened and fed direct to the Huntington mills).

The mixture of pulverized ore and water is fed into the end of a drum, which is caused to revolve slowly on rollers by means of a worm; oil is added by a separate pipe, made preferably telescopic to admit of its being discharged at different distances from the end. At each end there is a circular opening, and within the drum annular helical ribs extend from end to end; the spaces between these ribs are divided into cells by a number of equidistant blades, to effect a thorough intermingling of oil with the pulp and water, without being broken up. All three are carried to the opposite end of the cylinder or drum from the one where they entered, whence they are discharged through a number of circumferential holes into the subsidence vessel, where the water and sand or pulp are allowed to subside, the buoyant oil carrying the mineral ingredients floating on top. The oil is admitted at the same end as the feed. There are two or three drums, one underneath the other, the second treating the tailings of the first, and so on as the case may require. The feeding of the pulp, as well as of the ore and oil, is done in the upper cylinder. It is of importance to determine the point in the length of the drum at which the oil is to be admitted. If admitted at the beginning it would probably take up at once so much of the mineral as would make it sink in the feed water, and prevent its floating. Therefore the point of entry of the oil depends on the amount of mineral in the ore, and must be determined.

At Glasdir, where the ore is an impregnation of very fine copper and iron pyrites, in an altered slate, it was ascertained that practice had established a use of five times the weight of ore as the correct amount of water.

The right amount of oil to be added for the Glasdir ore, Messrs. Elmore determined to be about equal weights, or 1 ton of oil to 1 of ore. This amount varies with every ore. The oil, owing to its viscosity, will not flow readily, and small rotary pumps are introduced, acting like meters, propelling it forward. It was found impossible to determine the loss of oil by measurement. The storage tank contained more oil after the test than before, probably due to retained water and air. Messrs. Elmore determined the loss of oil, based on the experience of a run of over 700 tons, including what is retained in the concentrates, the tailings and what is lost by waste, to be 2 gals. per ton of ore treated. In the tests the amount of oil retained by concentrates and tailing proved to be about 1 1/4 gals. per ton. As the test was probably more carefully made than the 700-ton run, it seems safer to assume the experience of Messrs. Elmore, that is, a loss of 2 gals. per ton of ore with the Glasdir ore.

The mixture discharged through the holes from the drum flows, as mentioned before, into the subsidence vessel. Additional oil may be added to this vessel, at some distance down, by means of a separate pipe, to aid in floating the mixture.

From the subsidence vessel, in which the water and tailings are drained at the bottom, the oil carrying the mineral is pumped to a hydro-extractor having a solid basket with a projecting flange at the top.

\*An abstract from the "Transactions" of Institution of Mining and Metallurgy, April 25th, 1900.

This is found to give good results, running from 750 to 800 revolutions per minute. During the action of the machine the mineral and water pack in vertical walls, and the oil floating on the water rises vertically on the wall and creeps over the flange, or lid, of the solid basket and drops into space between the basket and the enclosing monitor, and from there goes to temporary storage tanks, whence it is pumped again to the reservoir or stock tank. The separated water is let out through an opening at the bottom, covered with a cone cover, after the machine comes to rest. The mineral is packed solid along the inner periphery of the basket. The final draining of the oil and water is accomplished in a smaller hydro-extractor with a perforated basket on the periphery, to which the mineral is transferred. The oil and water escape through the meshes and concentrates carrying about 4 per cent. of oil, and 4 per cent. of water remain behind.

Tests were made of the proficiency of the process on the very low-grade copper ore from the Glasdir Mine, carrying about, on an average, 1.12 per cent. copper, 0.049 oz. of gold per ton of 2,240 lbs., and 0.8 oz. of silver per ton of 2,240 lbs. Seven distinct and separate runs were made on this ore by the inventor, under close supervision, treating in all 43 tons of rock. These showed an average saving of 69 per cent. of the gold, 65 per cent. of the silver, and 70 per cent. of the copper with a rate of concentration of about 14 into 1. This is certainly a good saving when we consider the low grade character of the material operated upon.

The percentage of yield of the metals, is not the final net yield. It is subject to the usual smelters' charges and reductions for treatment of concentrates produced.

If the viscosity of the oil requires to be increased, the inventor adds from 2 to 3 per cent. of mineral butter, a later distillation product of residuum oil. If owing to climatic conditions the oil has to be thinned, a previous distillation product has to be added to the residuum oil. The temperature of the oil and water at the Glasdir Works is kept between 54° and 57°, though it is possible that wider margins may be permissible.

AN EFFECTIVE PIPE WRENCH.

The accompanying illustration shows the Johnson pipe wrench, which is a well-designed and effective tool of the class. Its convenience and ready application make it very useful in mine and mill work. The Johnson wrench consists of but three parts—combined head and handle, swinging jaw and pin; all parts are interchangeable and made of crucible steel, drop-forged. The jaws adjust themselves quickly to dif-



THE JOHNSON AUTOMATIC PIPE WRENCH.

ferent size pipe, and are instantly released by simply raising the handle. The wrench firmly grips galvanized or iron pipe or solid iron bars, it cannot slip, and is warranted not to crush. William B. Volger, of New York, is the manufacturer of this tool.

This wrench is now in use in mines in the East, and has found general approval.

ABSTRACTS OF OFFICIAL REPORTS.

Sons of Gwalia, Limited, Western Australia.

This company was floated in London with a considerable flourish of trumpets two years ago by Messrs. Bewick, Moreing & Co. The property is situated at Mount Leonora, in the Mount Malcolm District, of North Coolgardie. The capital is £300,000, of which £50,000 in cash was to provide for new plant and for additional developments. The report for 1899, which has just been issued, shows that the new plant has not been yet completed, and that large sums have been spent in putting the property in order. The old plant has been in operation during the year and produced 18,446 oz. fine gold. Of this total 17,092 oz. were produced in the battery from 17,655 tons of ore, 650 oz. from the cyaniding of 257 tons of concentrate, and 704 oz. from 1,500 tons of tallings. The amount realized by the sale of the gold was £78,318, and other sources of income brought the total receipts up to £79,185. The net profits for the year were £35,975, and the profit for 1898 was £30,777, which was undivided at the time, and now added gives a total for the two years of £66,353. It is proposed to pay a dividend of 10 per cent. and to devote part of the remainder to acquiring additional plant. It was determined on the formation of the company to erect 30 stamps, and it has now been decided to increase this to 50 stamps. The directors give details of the development work, but do not give any estimate of ore in sight nor its average contents, though no doubt the fact that they are ordering a large plant may be considered as presumptive evidence of large reserves.

Namaqua Copper Company, Limited, Cape Colony.

The report of this company for 1899 shows that the company has shared the recent prosperity of other copper producers. The company owns properties in Little Namaqualand, Cape Colony, in the same region as the better known Cape Copper Company. It was originally formed in 1887 and has a paid-up capital of £188,000. The dividends, commencing with 1888, have amounted in all to 92½ per cent., though for four years none were paid; but in the year just closed the dividend reached the unprecedented figure of 40 per cent. The total dividends since the foundation of the company have therefore been 132½ per cent. The receipts from the sales of ore during the year 1899 were £198,000 and the net profit was £115,384. Out of this £75,200 has been paid as dividend, £10,000 added to the reserve fund, and £20,000 set aside to provide funds for a contemplated new railway.

The amount of ore shipped per annum is about 9,000 tons, and it averages about 25 per cent. copper. The ore as it comes from the mine is partly hand picked and partly dressed by means of King's magnetic concentrator. The whole of the ore has hitherto been sent down by rail to Port Nolloth and shipped to Swansea, where it is sold to local smelters. There are also large accumulations of low-grade ore and of surface carbonates that have not yet been touched, but it is now proposed to adopt the system of precipitation for the low-grade sulphides and of leaching with acids for the carbonates. The reserves of ore remain about the same, about four years' output, and the development work has yielded satisfactory results.

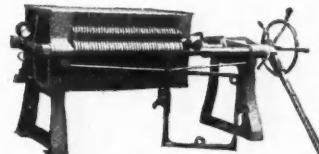
The climate of the country is not altogether desirable, as fever and consumption give trouble. Fortunately, the chief scourge of the country, typhoid fever, has been successfully combated and it has now entirely disappeared. The native workmen are not a very strong race and are much debilitated by their fondness for strong drinks, which they succeed in obtaining in spite of the efforts of the managers.

FILTER PRESSES IN REDUCTION WORKS.

The use of filter presses in reduction works for the rapid separation of materials held in suspension by leaching solutions is becoming more and more frequent. In chlorination work the final precipitates are pumped through the press and retained on the surface of the filter paper, which is afterwards stripped off and burned, leaving the values in the ashes, which may be refined afterwards in the usual way; while in the cyanide process the precipitates are of a more bulky nature, and somewhat coarser methods can be followed in filtering. The press may be simply equipped with cloths which can be scraped from time to time as the chambers fill.

We illustrate a press in common use for chlorination work, manufactured by Wm. R. Perrin & Company, of Chicago; this press having division frames between the plates which have corner inlet and outlet. This allows the application of filter paper in connection with the filter cloths, which are used for backing. The filter paper cannot be used with the center-feed type of press, though that is well adapted for many purposes where bulky precipitates are to be obtained.

Presses with division frames are also used for washing slimes. The chamber may be pumped full of the deposit and on turning the washing water through another channel, or corner feed, it may be made to pass through the cakes from the surface of one plate to the surface of the



PERRIN FILTER PRESS.

plate opposite, from which point it will be discharged; in this way most effectually washing the material in the press which presents a large surface in a thin layer to the percolating action of the liquid under pressure, which may be run to 150 lbs. if desired.

For handling corrosive substances in chemical works these presses are built with wooden plates and rings, but for the ordinary use of reduction works the iron construction stands remarkably well and has generally proved more suitable than the wood type of press. In the center-feed press the discharge is through a drip cock at the lower end of each plate; a desirable feature, because in case of imperfection in the cloth the particular plate may be cut off at the drip. The corner-feed press with division rings may also be equipped in this way with individual discharge for each plate, but the closed delivery with the corner channel is generally preferred. These presses are valuable in any process where rapid filtering is required, as they are built to stand heavy pressure and their applications for such purposes are numerous.

**ELECTRICITY FOR CANAL BOATS.**—It is announced that the Ohio Board of Public Works has decided to adopt an electric towing system on the canals owned by the State.

**FRENCH DEMAND FOR LEAD AND ZINC.**—United States Consul Brittain, of Nantes, under date of May 17th, 1900, says: "Inquiry has just been made at this consulate for prices (by the ton) of lead and zinc of all descriptions. American producers of these metals are requested to correspond with M. Albert Brosseau, of No. 4 Rue Cambonne, Nantes, France, and submit prices. Samples of sheet zinc and small blocks of lead may be sent through the mails. Prices should be stated in francs and centimes, and the metric system used in giving weights and measures."

**THE BEHR MONO-RAIL TRANSIT SYSTEM.**—A good deal of dis-appointment is expressed in technical circles in Europe at the refusal of the Parliamentary committee to sanction the construction of the as to the efficiency of the brakes proposed. Between Manchester and Liverpool. The Behr system is a development of the Lartigue system where the car runs pannier-wise on a single rail that is held on trestles. The motive power is electricity that is picked up from the conductor by the side of the rail. Mr. Behr claims that with properly constructed mechanism he could obtain a speed of 120 miles an hour. Recently a number of leading Manchester men proposed to try the system between that city and Liverpool, but of course the refusal of the Parliamentary committee to sanction the scheme has upset things for a while. The chief reason is that no reliable expert evidence had been given as to the efficiency of the brakes proposed. Between Manchester and Liverpool the demands for fast passenger traffic is very great. There are already three lines of railroad, the distance being 32 miles and the time taken on the way is 40 to 45 minutes.

## MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like will be reproduced whenever possible. Specimens should be of moderate size and should be sent prepaid; we cannot undertake to return them. If analyses are wanted we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

154.—J. M. T.—Mica.—To answer all your questions would be impossible in the limits of this column. The value of a mica deposit depends on the color of the mineral and the size of the sheets that can be prepared. The waste is usually very great, and the waste stuff or scrap is often pulverized and sold to wall paper manufacturers. As to the occurrence of mica, see "Engineering and Mining Journal," February 11th, 1899. The specimens you send are poor quality; the sheets contain spots, ribs and cracks. Such material would make but low grade of scrap and a deposit of it in New Mexico would be practically worthless.

155.—T. T.—Gossan.—The samples of limonite, hydrated sesquioxide of iron you send associated with clayey material may be, as you suggest, "gossan" or an "iron hat." Precisely similar material might result from the decomposition of a vein carrying iron-copper sulphides. The green specimen probably contains copper. Open the vein by surface crosscuts at several places, if the surface is not too deep, sample carefully, and have your samples analyzed by a competent assayer. Sink where indications are most promising.

156.—C. W.—Chrome Iron Ore.—The specimen you send is probably chromite, chrome iron ore. It is not cassiterite, tin ore, neither is it an ore of manganese. Analysis is necessary to determine the amount of chromium present and the value of the ore.

157.—J. S.—Anorthosite.—The rock you send is of common occurrence in the Adirondacks. The green mineral is plagioclase feldspar, the brown mineral is biotite mica, and the yellow is iron pyrite, with possibly a little copper pyrite. The rock may possibly carry a trace of gold, but the probabilities are that it carries nothing of any value.

158.—S. D. H.—Mica Sand.—The sample of "sand" you send is made up almost wholly of flakes of a micaceous mineral which originally was perhaps muscovite, but is now changing to a hydromica. The sample shows no traces of gold or silver. We make no charge for examining specimens. If you wish an assay made, we refer you to some of the assayers whose addresses you will find in our advertising columns.

159.—Stalagmite Sulphur.—The Field Museum, Chicago, possesses a remarkably fine specimen of stalagmite sulphur, that was found in the desert of Mapimi, Mexico. The specimen is almost pure sulphur, the sulphur in crystallizing taking curious shapes. The specimen is built up from the base on a half dozen distinct columns, which at the upper ends curl over, forming a flower-like mass of great beauty.

160.—G. D.—Quartz Crystals.—The little colorless crystals you send are plainly quartz, some showing characteristic double six-sided pyramids. Such crystals, when very clear, are sold as "Lake George diamonds," "Montana diamonds," etc. The crystals you send are too imperfect to have any value.

## QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Chromium.—Where can I procure data about chromium; its production and the processes of treating the ore?—W. S.

Answer.—The subject of chromium and its metallurgy is fully treated in "The Mineral Industry," Volume VIII, which has just been published.

Vanadium.—Are the industrial uses of vanadium sufficient at present to create an active demand for its ores and the products of its ores?—S. H. G.

Answer.—The demand for vanadium and vanadium salts is not sufficient to create what can be called an active demand. The quantity used is limited, and will probably remain so.

See "Engineering and Mining Journal," February 24th, 1900, page 234; also "The Mineral Industry," Volume VIII.

Mica.—I would like to know all about mica, its manner of occurrence, methods of mining, preparation for market, uses, value, etc.—J. M. F.

Answer.—The questions you enclose in your letter would require a treatise to answer them. As to the occurrence of mica, it has been recently treated by Dr. J. A. Holmes, State Geologist of North Carolina, in a paper read before the Geological Society of America, an abstract of which will be found in the "Engineering and Mining Journal," February 11th, 1899. As to its mining, uses, etc., you will find information in the articles on this subject in "The Mineral Industry," Volumes I and VI.

Leaching Copper Ores.—1. Is there any known process for leaching low-grade oxidized copper ores; also saving the gold and silver?

2. What does Gardiner's process for treating copper ores consist of? Where can I find more about it?—F. A. G.

Answer.—There are several processes in use for leaching low-grade

copper ores. Which of them is best suited to any special case depends on the composition of the ore chiefly.

The Gardiner process is referred to on another page, where you will find a statement as to what the process is.

Ferro-tungsten, Ferro-molybdenum, etc.—I see you quote ferro-tungsten, ferro-molybdenum and ferro-titanium among the commercial metals; also ferro-silicon. Please tell me where in the United States these metals are made.—S. E. M.

Answer.—Ferro-tungsten and ferro-molybdenum are made in this country by two firms, Stein & Boericke, at Primos, Pa., and Ash & Deninger, at Phoenixville, Pa. Ferro-silicon is also made by the Cowles Electric Smelting and Aluminum Company at Lockport, N. Y., and the Wilson Aluminum Company at Spray, N. C. These alloys are now produced and sold in such quantities that they are fairly classed as commercial metals.

Mining in Cuba.—Can you tell me if anything is being done in the way of opening new mines in Cuba?—J. de R.

Answer.—The only mines at present actively worked in Cuba are the iron and manganese ore mines near Santiago. Some prospecting is going on in different parts of the island—chiefly in Santiago Province—and a number of mining claims have been registered, and are still being registered. There seems to be little probability of more work until the questions of title and other similar matters are settled definitely. The companies operating near Santiago have old titles which are, of course, not affected by the change in government.

Recent registrations of claims include coal in the Province of Pinar del Rio; iron, copper and asphalt in the Province of Habana; asphalt and bituminous rock in Matanzas Province; iron, manganese, copper and zinc in Santiago Province. These registrations, of course, are simply claims or indications.

A LONG ELECTRIC LINE.—The Adriatic Railway Company of Italy, according to the London "Engineer," is about to apply the trolley system on its line from Lecco to Chiavenna and Sondrio, 66 miles of rail. Hydraulic power will be derived from the River Adda, near Morbegno, and the overhead wire will be supplied with a current at a tension of 3,000 volts. The electrical machinery has been ordered from a Hungarian firm.

ONTARIO GOVERNMENT ASSAY OFFICE.—The report of the laboratory of the Ontario Government assay office located at Belleville, which is conducted by the Bureau of Mines as an aid to the discovery and development of the mineral resources of Ontario, shows a total receipt of 52 samples sent in for examination during the month of May. The assays or analytical determinations aggregated 84, consisting of 27 for gold, 11 for silver, 14 copper, 6 nickel, 2 zinc, 2 platinum, 1 cobalt, etc. Fourteen iron ores for examination as to smelting quality were sent in from Eastern Ontario, where there is considerable activity in iron ore, owing to active demand for good quality of iron ore.

Most of the gold ores came from the Michipicoten and Rainy River districts and about 50 per cent. carried paying values in gold. The nickel-copper ores were sent in from the Sudbury District, where there is a remarkable activity in prospecting and development, despite the report that the Government regulations prohibiting export of nickel-copper mattes and ores would hinder the progress of the industry.

The fees collected amount to \$88.60, being about one-half custom rates. The Bureau of Mines required two determinations from the laboratory. Eight samples sent in for identification or report on probable commercial value were received, on which nominal fees amounting to \$4 were collected.

## PATENTS RELATING TO MINING AND METALLURGY.

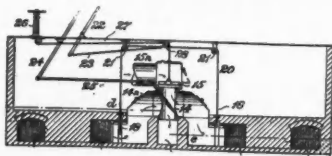
## UNITED STATES.

The following is a list of the patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

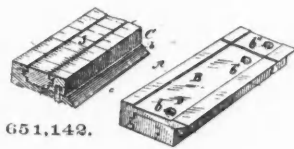
Week Ending June 5th, 1900.

- 650,873. METHOD OF MAKING RIBBED PLATES. Christian Shively, Carnegie, Pa., assignor to the Dilworth, Porter & Company, Limited, Pittsburg, Pa. The method consists in rolling up and down oppositely projecting ribs on opposite sides of a bar and then bending the ribs of one side of the bar out and into alignment with the body of the bar.
- 650,876. METAL-WORKING MACHINE. David B. Swinton, Montreal, Canada. The combination of a stationary matrix-block, and a reciprocating male die, said matrix-block being in the form of a U with its legs extending horizontally toward said male die, and a retainer yieldingly connected to said male die to move therewith.
- 650,896. PUMP. Joseph M. Green, Mill Creek, Utah. A pump, comprising a series of cylinders, having an offset and formed of a single piece, the lower plate provided with perforated cups and valves, plates, top plate, pistons, having the perforations and formed of two parts, having packing, and a valve, a reservoir mounted upon the offset and communicating with the cylinders by channels, and valves arranged above said channels and within the reservoir.
- 650,911. ANTIFRICTION ALLOY. William N. Rumely, La Porte, Ind. An improved antifriction alloy formed of lead about 72 parts, antimony 12 parts, phosphorus 0.0175 part, and tin about 15.9825 parts.
- 650,937. GAS-SEPARATOR. John W. Hough, Marion, Ind. An apparatus for separating water, gas and oil, comprising a reservoir, having a passage-way through which the water and oil pass, an inlet-pipe and gas-outlet pipe, a standard, a lever pivoted thereto, a rod pivoted at one end to said lever, and its other end connected to the end of said reservoir, a weight on said pivoted lever, a plunger and lever connections between same and the weighted lever, said plunger normally seated over a valve-aperture in the passage-way leading from the reservoir.
- 650,938. REGENERATIVE FURNACE. William Swindell, Allegheny, Pa. The combination of a combustion-chamber, air and gas generator chambers communicating with opposite ends thereof, pairs of flues leading from the air-generator chambers and the gas-regenerator chambers, respectively, to the casings of independent reversing-valves, an air-supply pipe and a gas-supply pipe, leading, respectively, into one and the other of said casings, a stack-flue leading

outwardly from both of said casings, valves or dampers, each controlling one of the regenerator-chamber flues, intermediate con-



650,918.



651,142.

nections through which the valves of each pair of flues are movable in opposite directions respectively, and means for independently operating each of said intermediate connections.

650,975. **PACKING FOR OIL-WELL PUMPING APPARATUS.** William E. Karns, Parker's Landing, Pa. A cupped metallic packing-ring for oil-well-pump plungers, the same having a continuous transversely yielding periphery for contract with a pump-barrel.

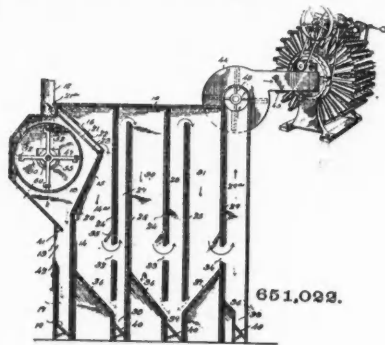
650,980. **PROCESS OF MAKING METALLIC SULPHATES.** Otto Meurer, Cologne, Germany. Process for manufacturing sulphates from sulphide ores containing sulphide of iron consisting in heating the ores with polysulphides of the alkalis, cooling the mass and causing it to crumble after the addition of water, drying the mass and subjecting the crumbled dried mass to spontaneous oxidation at air, and lixivating afterward the oxidized mass with water whereupon the obtained solutions of sulphates are separated from the undissolved remains.

650,991. **DIPPER ATTACHMENT FOR DREDGES.** Arthur W. Robinson, Milwaukee, Wis. The combination, in a dredge-dipper, of an arm or handle, lugs on the end of the handle, a plate extending across the rear side of the dipper, having lugs thereon which with those on the arm form a hinge, other lugs at the upper rear edge of the dipper, and braces extending from the last-named lugs to the arm.

651,006. **CONCENTRATOR.** Samuel T. Curtis, Virginia City, Nev. A concentrator comprising a table, means by which it is freely suspended at a point between its ends whereby it is substantially balanced, means whereby the balance of the table is regulated, horizontal guides for the upper end of the table, and means whereby the table is reciprocated longitudinally.

651,017. **CARBURETER.** Antonio L. Navone, Calistoga, Cal. An apparatus for generating explosive gas from hydrocarbon liquid, consisting of a closed exterior case, a pipe extending vertically through the case to receive and conduct the hot exhaust-vapors from an engine, a spiral trough, coiled about and supported upon said pipe within the case, means for supplying hydrocarbon liquid into the upper end of the trough, means for supplying air within the case to be mixed with said vapor, and means for discharging the mixed explosive vapor from the generator.

651,022. **APPARATUS FOR SEPARATING GOLD FROM SAND.** John P. Sterling, Kansas City, Mo. In a pneumatic apparatus for separating gold from sand, a series of alternating drop-passages and uptake passages, the latter having pockets at their lower ends, and



651,022.

said drop-passages having inclined bottoms conducting to said pockets, and said uptake-passages communicating with said drop-passages at their upper end and also at intermediate points above the bottoms thereof, whereby eddies are formed in the lower portions of the drop-passages, for the purpose set forth.

651,026. **PROCESS OF PRODUCING INCOMBUSTIBLE LAMPWICKS.** Adolf Albrecht, Berlin, Germany. The process consists in first saturating the wick with a solution of a magnesium salt, and thereafter treating the same with a solution of an alkali or alkaline salt and thus producing a precipitation of an insoluble salt of magnesium on the fibers of the wick.

651,029. **APPARATUS FOR CONVEYING AND UTILIZING LIQUID AIR OR OXYGEN.** Stephen H. Emmens, New York, N. Y. A package for conveying liquid air or oxygen consisting of an open-ended inner receptacle adapted for use as a torpedo for exploding oil-wells, an open-topped inner vessel forming an annular chamber around said inner receptacle, a chambered main body and a lid for the same of non-conducting material inclosing said inner receptacle and inner vessel, an outer vessel or case of which said non-conducting body forms the lining, and a base attached externally to the bottom of said case; said non-conducting body, case and base being provided with escape-passages, and said inner receptacle and inner vessel being charged with the liquefied gas.

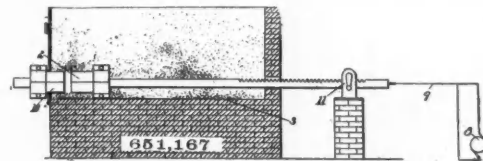
651,051. **MACHINE FOR DRAWING WIRE.** Ferdinand Phillips, Philadelphia, Pa. The combination with a die of a drawing drum or block, a drum-driving shaft, speed-reducing and power-increasing intermediate positive gearing for coupling the shaft with the drum and a friction-clutch interposed in said mechanism and acting on a high-speed member thereof.

651,073. **CEMENT PLASTER.** Don D. Harding and Alonzo L. Meddock, Delta, Colo. A cement plaster consisting of a mixture of calcined gypsum, sand, wheat-flour, glue, white vitriol, saltpeter and rain-water.

651,089. **PROCESS OF PRODUCING POSITIVE PLATES FOR BATTERIES.** Hans Strecker, Cologne, Germany. A process for producing positive mass-plates, having the central portion omitted for use in connection with electric accumulators, said plates being composed of a mixture of litharge and lead carbonate, slightly moistened with a dilute alkaline solution.

651,142. **SLIDE-RULE.** Willie L. E. Keuffel, Hoboken, N. J., assignor to the Keuffel & Esser Company, same place. A slide-rule consisting of a slide adapted to reciprocate in juxtaposition with one or more rules separably mounted on a suitable base, each separable rule being provided with means whereby it may be transversely adjusted and firmly secured to the base after adjustment.

651,167. **MANUFACTURE OF CARBIDE OF CALCIUM.** James E. Hewes, Baltimore, Md., assignor to the Provident Life and Trust Company, trustee, Philadelphia, Pa. The process of continuously producing carbide of calcium and the like which consists in arranging electrodes in horizontal and parallel position beneath a mass of raw material, completing the circuit through an armature applied to

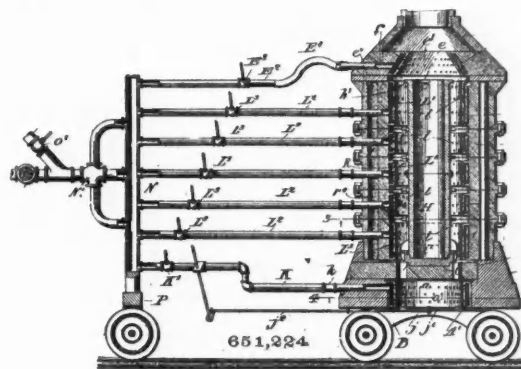


651,167.

said electrodes and withdrawing and adjusting the electrodes in the direction of their lengths and in respect to the armature to start the formation of the product, removing the armature and completing the circuit through the fused material, adjusting the electrodes endwise evenly or unevenly as may be required in respect to the product to control the circuit, allowing the product to solidify beneath the mass of raw material, and drawing the product from beneath the mass and away from the ends of the electrodes.

651,223. **LIQUID-AIR CONTAINER.** John S. Wrightnour, Oil City, Pa. A liquid-air container, comprising two chambers divided by a hermetic partition, a cup supported by the partition out of contact with the side walls of the container and the cup projecting into one of the chambers and communicating with the other, the chamber in which the cup is projected being hermetically sealed to permit the formation of a partial vacuum therein, and pipes or tubes passing through the container for supplying the liquid air to the cup and for withdrawing the same from the chamber with which the cup communicates.

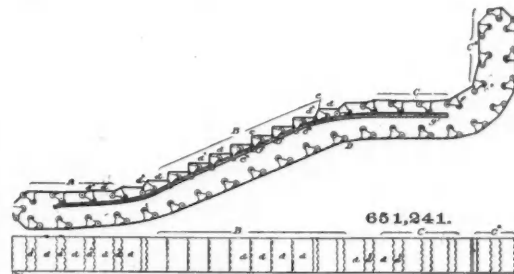
651,224. **CASTING APPARATUS.** William D. Allen, Huntsville, Ala. The combination with a casting-chamber, of a plurality of burners around the wall of the chamber located in a number of planes,



651,224.

a plurality of burners above the casting-chamber and communicating therewith, and a separate valved fluid-supply pipe for the burners in each plane and those above the casting-chamber.

651,241. **ENDLESS BELT CONVEYOR.** James M. Dodge, Philadelphia, Pa. In an elevating-conveyor having horizontal and inclined portions, a band constructed at all portions throughout its length for the support of the load, and means for causing flexure of the band



651,241.

at predetermined intervals throughout the length of the inclined portion, to form carrying-sections for the load, the carrying and return runs of the conveyor being disposed one above another.

651,249. **INCORUSTATION PREVENTIVE.** Edward Holm, Chicago, Ill. A compound, for the prevention and removal of scale from steam-boilers, consisting of tin, antimony, mercury and nitrate of silver.

651,330. **STONE-SAWING APPARATUS.** William Harvey, Denver, Colo. A stone-saw comprising a series of flat links and hinge-rivets connecting the links forming an endless edgewise-flexible instrumentality, the links having recesses formed in their cutting edges which are provided with diamonds.

GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy.

Week Ending May 12th, 1899.

8,123 of 1899. **TREATING SULPHIDE ORES.** A. W. Chase, Cuba. Method of treating mixed sulphide ores, combining the process for producing sulphuric acid, extracting the copper by roasting with salt and lixiviating, and then using the remaining iron in the blast furnace.

12,610 of 1899. **SAVING GOLD FROM SEA WATER.** J. F. Duke, London. Precipitating gold from sea water by chalk, effected by passing the sea into large reservoirs in chalk cliffs.

1,427 of 1900. **CRUSHING ROLLS.** T. L. and T. J. Sturtevant, Quincy, Mass., U. S. A. Method of relieving the strain on bearings of crushing rolls.

## PERSONAL.

Mr. O. P. Posey plans to go to Europe shortly.

Mr. R. N. Dickman is now in British Columbia investigating a copper proposition.

Mr. W. H. Thomas was in Utah for a few days last week on his way to Southern California.

Mr. George F. Beveridge, a mining man with large interests in Mexico, is in San Francisco.

Mr. Victor C. Clement is again on the Pacific Coast. He expects to return to Salt Lake early in July.

Mr. Hamilton Smith is in San Francisco in the interests of the London Exploration Company, of London.

Mr. W. F. Snyder, one of Utah's progressive mining men, was in New York the first of the week on a business errand.

Mr. John K. Mackenzie, mining engineer of Chicago, has gone to southern Pennsylvania, where he will examine an iron mine.

Mr. George W. Small now holds a position of responsibility with the Montezuma Lead Company, at its mines at Santa Barbara, Chihuahua, Mexico.

Mr. Henry Straus, of Straus & Company, New York City, manufacturers of "Boilerine," will sail for Europe June 30th, to take charge of the firm's exhibit in Paris.

Mr. V. A. Kajievnikoff, chief engineer of the Chinese Eastern Railway, has been in New York City obtaining quotations on electric lighting plants, machine shop tools, etc.

Mr. O. E. Weller, after a trip to New Mexico, California and Utah of more than a month, visiting different mines in which he is interested, returned to Boston the first of this week.

Mr. Frederick G. Corning, president of the Exploration Company of New York, is in Dakota examining some mines for London capitalists. Mr. Corning leaves for Europe July 18th.

Mr. C. T. Mixer, superintendent and mining engineer for the Missouri Zinc Fields Company, Joplin, Mo., has been granted a leave of absence to examine some Tennessee iron properties for eastern parties.

Mr. Thomas J. Hurley, vice-president of the Exploration Company of New York, left for Colorado June 14th, on his annual visit to the properties in which the firm is interested, and will return to New York the latter part of July.

Mr. Victor M. Clement, accompanied by his wife, arrived at Salt Lake last week, coming direct from London, and has gone to California, where he acquired some very promising mining propositions last year. Mr. Clement left Salt Lake last January for his European tour.

Mr. J. R. Countryman, junior member of the firm of Luckraft & Countryman, mining engineers of Cripple Creek, Colo., passed through Denver a few days ago on his way to Encampment, Wyo., where he will establish a branch office in the Grand Encampment District.

Mr. O. E. Weller arrived in Salt Lake City from New Mexico a week ago. He expresses himself as greatly pleased with the recent exploration at the Bingham Copper and Gold properties and is encouraged to believe that the new smelter will be in commission by November 1st.

Mr. Henry C. Brown is on a vacation at Geneva, Ill. September 1st he returns to Prietas, Sinaloa, Mex., where he has accepted the position of general manager with the Sonora Gold Mining Company, of St. Joseph, Mo., which recently purchased the property of the Union Mining Company.

Mr. Spencer Miller, chief engineer of the Lidgerwood Manufacturing Company's cableway department, will sail from New York June 23d on the "Patricia" for Europe. Mr. Miller will be accompanied by Mrs. Miller, and goes abroad in the interests of his recent invention for coaling warships at sea.

Prof. Robert Richards, of the Massachusetts Institute of Technology, Boston, accompanied by a number of students of that institution, has been visiting the various iron mines round about Dover, N. J., the furnace at Port Oram and other places of interest, going as far as Pottsville and Bethlehem, Pa.

Mr. W. Weston, mining engineer of Cripple Creek, Colo., has just returned from an inspection of the mines of the Whitehills Mining and Milling Company near Kingman, Ariz., of which he is manager. He is now leaving for Wyoming to inspect the properties of the Battle Lake Consolidated Copper Company. He was accompanied on his trip to Arizona by Mr. Harold Buckley, of Galtee Castle, Ireland, and Mr. Rye-croft Hall, Manchester, Eng., who is a large owner in the Whitehills Mines.

Mr. F. P. Swindler, general superintendent of De La Mar's Nevada Gold Mining Company, mines and cyaniding mill in Lincoln County, Nevada, tendered his resignation last week, to take effect as soon as he can be relieved. During the year and a half he has had charge of Nevada's great gold mine he has been absent from De Lamar but twice and then only for a few days on business for Captain De La Mar. In the first few months he had charge the cost of mining and milling were considerably reduced. It is not known what Mr. Swindler's future plans are, but his temporary headquarters will be in Salt Lake City.

## OBITUARY.

Press dispatches from South Africa have stated the death in action at the Zand River, near Bloemfontein, of Major Louis L. Seymour, commanding the Railway Pioneer Regiment attached to Lord Roberts' army. Major Seymour was an American and was born at Whitney's Point, Broome County, N. Y., in 1860. He attended the village school, and studied mathematics and civil engineering at night. His first regular work was with the Lackawanna Coal & Iron Company, in Scranton, where he continued to study engineering. In 1882 the Dickson Manufacturing Company of Scranton sent him to South America to set up some heavy machinery in the El Callao Mine, Venezuela. There he remained 3 years, becoming superintendent. He returned to the United States and was kept busy installing heavy machinery until 1888, when he went to Kimberley for the De Beers Mining Company. There he designed some heavy hoisting apparatus capable of lifting a loaded cage from a depth of 2,000 ft. to work the deep levels. When he left the diamond mines he was acting superintendent. He spent 3 years in London as consulting engineer for the Kimberley people, and then went to Johannesburg as superintendent of the Rand Mines, Limited. He was at one time a consulting engineer for the firm of Fraser & Chalmers. He showed the same ability in military service that he had shown as an engineer, and his untimely death is deplored by a wide circle of friends.

## SOCIETIES AND TECHNICAL SCHOOLS.

International Mining Congress.—This convention, at Milwaukee, Wis., began its sessions on June 19th.

Engineers' Club of Philadelphia.—At the meeting on June 2d there were 67 members and visitors present.

Mr. Henry G. Morris read a paper upon "Pumping-Engines of the Philadelphia Water-Works," illustrated by a large collection of lantern slides. After giving the dates of installation of various parts of the city water supply, he gave a brief description of the different styles or types of pumping-engines which have been installed in recent years.

In the discussion which followed, Prof. Luigi d'Auria described the hydraulic compensator and other details of the pumping-engine which bears his name, and remarks were made by Messrs. Fred. W. Gordon, John E. Codman, L. Y. Schermerhorn, John C. Trautwine, Jr., E. M. Nichols and T. C. McBride.

American Chemical Society.—New York Section.—At the June meeting the retiring chairman, Dr. McKenna, invited the president of the society, Dr. McMurtrie, to preside. An address was made by Dr. McKenna on the "Advancement in the Study of the Properties of the Metals," and on the "Present and Future of the New York Section of the American Chemical Society."

The election of officers for the ensuing year resulted as follows: Chairman, Dr. C. A. Doremus; secretary and treasurer, Durand Woodman; executive committee, C. F. McKenna, M. T. Bogert, P. C. McIlhenny.

The following papers were read: "Comparison of the Iodine and Bromine Figures of Fatty Oils," by H. T. Vulte and Lily Logan. "The Chemistry of Materials used in Perfumery and Kindred Arts," by T. C. Stearns. "Rapid Method for Separation of Cadmium, Bismuth, etc., from Zinc and Manganese," by Geo. C. Stone. "On the Oxidation of Platinum," by Dr. R. C. Hall.

Montana School of Mines.—At the last meeting of the trustees of this school, at Butte, two more professors were elected, thus completing the faculty with the exception of one assistant instructor. The chairs filled were those of geology and mineralogy, and mechanics and mining engineering. Professor Alexander N. Winchell being elected to the former chair and Charles H. Bowman to the latter. Professor Winchell is a brother of Horace V. Winchell, of Anaconda, and is at present United States mineralogical expert at the Paris Exposition, where he has charge of the mineral exhibit. He is a graduate of the University of Minnesota, and since 1898 has been a student at Paris, France. He is 26 years old. Professor Bowman is 27 years of

age, and is a graduate of the State University of Iowa of the class of '95, and a post-graduate of Chicago University. He has been instructor in physics, electricity, machine shop work and in thermodynamics. W. G. King was recently elected professor of chemistry and metallurgy.

Society for the Promotion of Engineering Education.—The society will hold its 8th annual meeting on July 2d, 3d and 4th, at Columbia University, New York City. Among the topics to be brought before the society are the following:

President's address; "Engineering Education in the United States at the End of the Century," Ira O. Baker, University of Illinois; "Business Methods in Teaching Engineering," Arthur L. Rice, Pratt Institute; "The Present Status and Tendencies of Engineering Education in America," Robert Fletcher, Thayer School of Civil Engineering; "The Projection Lantern in Engineering Education," Charles R. Richards, of the School of Mechanic Arts, University of Nebraska; "The Relations of the Technical School and the Manufacturer," Walter B. Snow, of Jamaica Plain, Mass.; "What Should be the Characteristic Features of a Course of Mathematics for Engineering Students?" Arthur E. Haynes, University of Minnesota; "The Possibilities of Correspondence Instruction," George A. Goodenough, University of Illinois; "The Promotion of Engineering Education," William G. Raymond, Rensselaer Polytechnic Institute. The president of the society is Ira O. Baker, Champaign, Ill.; secretary, Edgar Marburg, Philadelphia; treasurer, Clarence A. Waldo, Lafayette, Ind. In the absence of the president and secretary, Vice-President Robert Fletcher, Hanover, N. H., will preside at the meeting, and Albert Kingsbury, of Worcester, Mass., will act as secretary.

## INDUSTRIAL NOTES.

The Finance Company of Pennsylvania, commercial agent for the Philadelphia & Reading Coal and Iron Company, has removed its Boston office from 125 Milk St. to 89 State St.

The Colorado Iron Works Company, of Denver, Colo., has secured the contract for the furnaces of the new pyritic smelter to be erected at Florence. The work will be finished, it is thought, by November 1st.

On Monday of this week the Robt. Aitchison Perforated Metal Company, of Chicago, Ill., states that it received in its first mail orders from Vermont, Utah, Minnesota and Louisiana. The company reports business as holding up very well.

Messrs. R. Heathfield & Company, of Leadenhall street, London, E. C., have been appointed sole English agents for the iron and steel manufactures of the Tennessee Coal, Iron and Railroad Company, and also London agents for the sale of its pig iron.

The firm of Frenier & Le Blanc, sand pump manufacturers, was dissolved by mutual consent on May 15th, Mr. L. Le Blanc retiring, and Mr. J. H. Frenier continuing the business and assuming all the indebtedness and performing all the contracts of the firm under the new name of Frenier & Son. All debts due the old firm are to be paid to J. H. Frenier.

The Edward P. Allis Company, of Milwaukee, Wis., during May booked orders for 26 engines, among the principal machines being a horizontal cross compound engine of 1,500-H. P. from the Grand Rapids Street Railway Company, of Grand Rapids, Mich.; a vertical cross compound engine of the same power from the Milwaukee Electric Railway and Light Company.

It is stated that the National Steel Company has been taken into the steel rail pool, the company now being a producer of rails, from its plant at Youngstown, O. As now constituted the rail pool includes the Carnegie Company, National Steel Company, Cambria Iron Company, Lackawanna Iron and Steel Company, Pennsylvania Steel Company, Maryland Steel Company and the Federal Steel Company.

Two hundred men are at work on the foundations for the crusher plant at the Edison cement plant near Stewartsville, N. J., which is to be 70x480 ft. There will be 27 steel buildings and all will be connected by a tunnel 2,960 ft. in length, in which the electric conveyors and wires will be run. The tunnel will range in depth from 12 to 20 ft. The bridge across Pohatcong Creek is complete and the big 110-ton steam shovel in place.

The B. F. Sturtevant Company, of Boston, states that it has been perfecting and completing its line of electric propeller ventilating fans for moving air against moderate resistance. These range in ordinary sizes from 18 in. to 60 in. and are provided with direct-connected enclosed electric motors. To meet the summer demand for these fans the company reports that its electrical department is being worked to full capacity.

The Dearborn Drug and Chemical Company, of



Chicago, has recently more than doubled the capacity of its manufacturing plant for boiler compounds and has greatly enlarged its business offices in the Rialto Building. The laboratory is very complete, a separate room being maintained for each branch of work. The laboratory is devoted almost wholly to the analysis of water, scale and oils sent in by customers and prospective customers, such analysis being free. William H. Edgar is president of the company.

It is announced that the Delaware Forge and Steel Company, recently chartered, with a capital of \$5,000,000, has secured a tract of 200 acres at the junction of the Delaware and Christiana Rivers, near Wilmington, Del. The president, John Fritz, was for years connected with the Bethlehem Steel Works. The company is to make heavy steel forgings and steel castings and may employ 5,000 hands. Work on the buildings is expected to begin in a short time. The plant when finished will be the largest in the State.

The Magnolia Metal Company, manufacturer of anti-friction metal, has opened a branch office at San Francisco under the management of Messrs. Chas. C. Moore & Company, engineers, of San Francisco, who have branch houses at Los Angeles, Seattle and Honolulu, and with whom the Magnolia Company has recently signed a contract giving them the exclusive agency for "magnolia metal" in the States of California, Oregon, Washington, Montana, Nevada, Idaho, Arizona, Utah and New Mexico and the Hawaiian Islands.

Chas. A. Bennett, of New York City, has been awarded an order by a representative of the well-known Robinson Gold Mines, near Johannesburg, for the supply of 5 large Bennett-Corliss compressors of 1,200 H. P. each and weighing 170,000 lbs. They will be utilized for supplying air in the deep galleries of the mines, as well as for driving hoists, drills, pumps and so forth. The value of the contract is stated to exceed \$100,000. The compressors are being built by Lane & Bodley of Cincinnati. One machine is now about to be shipped, while delivery of the other 4 machines will be made inside of 8 months.

For 12 years the firms of Robert W. Hunt & Company and Hallsted & McNaugher, and the latter's predecessors, G. W. G. Ferris & Company, have been associated as consulting engineers, inspectors of rails, structural and bridge materials, locomotives, machinery, etc., conducting business under their respective firm names. That the interests of their clients may be more fully protected, it has been decided to merge the 2 firms into one organization to be known as Robert W. Hunt & Company, the partners being Robert W. Hunt, John J. Cone, A. W. Fiero, James C. Hallsted and D. W. McNaugher. The firm's offices will remain at The Rookery Building, Chicago; Monongahela Bank Building, Pittsburg, Pa., and Empire Building, New York.

Pawling & Harnischfeger, Milwaukee, Wis., have recently taken the following export orders: Fraser & Chalmers, one 30-ton electric crane; Rio Tinto Company, one 40-ton electric crane; Kockums Mek Werkstads Aktiebolag, Malmo, Sweden, one 30-ton electric crane. Among domestic orders taken in May are the Cooke Locomotive and Machine Company, one 30-ton electric traveling crane and one 10-ton electric traveling crane; Sweet's Steel Company, one 30-ton electric traveling crane; Baldwin Locomotive Works, one 10-ton; Westinghouse Machine Company, one 3-ton; Pardue Iron Works, Perth Amboy, one 5-ton, and the Edison Electric Illuminating Company, one 50-ton electric crane, 96 ft. 6 in. span, to be erected in the largest power house in the world, generating 160,000 H.-P.; also six 10-ton cranes for the different power stations of the same company.

**TRADE CATALOGUES.**

The American Spiral Pipe Works, of Chicago, Ill., is sending out circulars setting forth the merits of spiral riveted pipe as regards strength, cheapness and ease of laying. The company states that it is prepared to furnish such pipe in 20-ft. lengths from 3 to 16 in. in diameter.

Prospectors and miners will be interested in a little pamphlet just got out by the Edson Manufacturing Company of Boston. This pamphlet points out the suitability of the Edson diaphragm pump for gold placer work, such as draining pits, forcing water up hillsides, and affording an opportunity to prospect with the "long tom" in otherwise impossible situations.

The Secor motor, an internal combustion engine using kerosene oil as the motive power, is described in an illustrated 16-page pamphlet published by the General Power Company of New York City. Among other advantages, the Secor motor is stated to have an absolutely safe oil supply method, an efficient method of introducing accurately measured charges of unheated air and liquid fuel into the cylinder, and a variable automatic governor.

The Bristol Company, of Waterbury, Conn., issues an 8-page circular which gives a partial list of the Bristol recording instruments for pressure, temperature and electricity. Of recording vacuum gauges the company shows 5, of recording combination vacuum and pressure gauges, 8, and of recording pressure gauges, 42. The list gives the pressure ranges of these gauges and states that gauges with special ranges are made to order. The recording thermometers of the company, for ovens and closed spaces number 12, and it is announced that pyrometers for ranges above 650°, the present maximum, are in preparation. The list of the Bristol recording volt, ampere and watt meters is long and varied.

Gasoline and distillate hoists are described in a handsome illustrated pamphlet published by Fairbanks, Morse & Company. Gasoline engines have proved of much value in mining regions where water or fuel is scarce, but they are also, as pointed out in the catalogue, economical for intermittent work. The hoists described in this pamphlet are built in 2 styles, geared hoists from 6 to 44 H. P. and flat friction hoists of the same horse-power. The starter pump attached to the cylinder in the Fairbanks-Morse hoists can be used in connection with an electric or a tube igniter. A convenient gasoline or distillate outfit for prospectors' use is shown; also a combined hoist and air compressor outfit for a small mine. The Fairbanks-Morse Company has its headquarters in Chicago, but has branch offices in St. Paul, Minneapolis, St. Louis, Denver, Kansas City, Omaha, Indianapolis, Louisville, Cincinnati, Cleveland, San Francisco, Los Angeles and Portland, Ore.

**MACHINERY AND SUPPLIES WANTED.**

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods of any kind, and shall be pleased to furnish them information, catalogues, etc. All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, and have no pecuniary interest in buying and selling goods of any kind.

**GENERAL MINING NEWS.**

**ALASKA.**

**Douglas Island.**

Alaska Mexican.—The company reports for May the crushing of 13,777 tons ore by 120 stamps in 28½ days, yielding \$21,156, and 221 tons sulphurets, yielding \$3,766. Total receipts were \$26,662, and the expenses \$16,977. The average of the ore was \$1.94 per ton.

Alaska United.—The company reports for May 16,977 tons ore crushed by 220 stamps in 30½ days, yielding \$37,445, and 603 tons sulphurets, valued at \$13,884. The average of the ore was \$2.02 per ton. The receipts were \$55,928, and the expenses \$39,673.

**ARIZONA.**

**Cochise County.**

Commonwealth Mining Company.—According to a Tucson despatch, the entire surface plant of this company's gold mine at Pearce has been destroyed by fire. The mills and hoist and the timbering in the main shaft are a total loss. Negotiations were pending for the sale of the mines to an English syndicate, and experts had just completed the examination. The loss is put at \$300,000. The company is a Philadelphia concern, with R. A. F. Penrose president.

**Graham County.**

Arizona Copper Company.—This company reports that its production of copper for the month of May was 651 tons of 2,000 lbs. The production for the month was reduced by about 200 tons, owing to an accident to one of the large bridges on the Arizona & New Mexico Railroad, which was in the hands of contractors being rebuilt. This accident temporarily stopped supplies being taken into Clifton.

**CALIFORNIA.**

**Calaveras County.**

(From Our Special Correspondent.)

Melba.—Work has been resumed on this property on Chili Junction. The 2 compartment shaft will be continued to the 200 ft. and then a single compartment will be sunk. K. Whitfield is superintendent.

**Kern County.**

(From Our Special Correspondent.)

Napoleon.—This mine at Randsburg, has been opened up to 150 ft., and about \$75,000 in gold taken out. The officers of the new company are F. L. Clayton, president; F. Griffith, vice-president; J. W. Montgomery, secretary, and H. S. Hicks, treasurer.

**Napa County.**

Aetna Consolidated Quicksilver Mining Company.—For the six months ending June 30th this company reports gross earnings amounting to \$74,700. The expenses were \$39,088, leaving the net earnings \$35,612. From this dividends amounting to \$15,000 were paid, leaving a balance of \$20,612.

Napa Consolidated Quicksilver Mining Company.—For the six months ending June 30th this company reports gross earnings of \$112,500. The working expenses were \$78,919, leaving \$33,581 as net earnings. The dividends paid were \$30,000, leaving a surplus of \$3,581.

New Idria Quicksilver Mining Company.—This company reports its earnings for the six months ending June 30th at \$102,600, while the expenses were \$53,307, making the net earnings \$49,293. From this dividends amounting to \$40,000 were paid, leaving a balance of \$9,293.

**Nevada County.**

(From Our Special Correspondent.)

Culbertson.—It is reported that C. W. Bonnemort is making arrangements to resume work on this property, 2 miles west from Graniteville.

Home Mining Company.—A large force of men is employed on preparatory work for erecting a new mill building. The stamps are now on the way to the mine. This mill, in addition to the Cadmus Mill, will give a milling capacity of 30 stamps.

**Placer County.**

(From Our Special Correspondent.)

Hidden Treasure.—The main tunnel is now in 8,500 ft., and the channel has been breasted to a width of 600 ft. No. 5 gangway is to be extended, crosscutting the channel 1,100 ft., thence north up the channel 1,000 ft., in order to work a portion of the upper lead where the main tunnel is too high to work it. An electric hoist and pump has been located in a room off the main tunnel, 5,000 ft. in, to develop the blue channel 32 ft. lower. A drift 350 ft. has been run on the channel, and crosscuts have developed 150 ft. of gravel. One hundred and seventy-five men are employed under Superintendent Charles D. Akers. The electric road brings out 350 carloads of gravel daily. A \$38 nugget was found recently.

San Francisco capitalists have started a large outlet tunnel on the Middle Fork of the American River at Spring Garden, which will be low enough to tap all the channels in the divide. About 7 miles between Spring Garden and Forest Hill can be worked through it, and many well-known claims on both sides of the ridge will be effected. This district, known as the Forest Hill Divide, has produced many millions of dollars from drift and hydraulic workings. The gravel will probably be struck at 1,500 ft.

**San Bernardino County.**

(From Our Special Correspondent.)

California Portland Cement Works.—The shipments from the works of this company near Colton average 4,300 bbls. per month. Seventy-five men are employed.

Needles.—The foundations for an 80 ton custom smelter to be erected on the Colorado River at Needles are being laid, and several carloads of machinery are waiting on the side tracks. This smelter expects to obtain its ores from the many mining districts along the Colorado River above and below Needles and those camps tributary to the Atchison, Topeka & Santa Fe Railroad throughout the Mojave desert. Mr. Corning, of Chicago, is directing the enterprise.

**San Diego County.**

(From Our Special Correspondent.)

National City Reduction Works.—The plant was completely destroyed by fire on June 10th. The buildings containing the mill and other machinery were erected about 9 years ago, but have been idle for some time. The cyanide plant erected by S. H. Lucas for working the tailings was also destroyed.

**Shasta County.**

(From Our Special Correspondent.)

Crystal Pool.—This group of copper claims at the head of Stillwater Creek, near the Black Diamond Mines, is being developed by Fowler, Hobbs, Le Barron & Merritt, the owners. A contract has been let for a tunnel, which is now being driven. The prospects are good. The ore carries gold and silver.

Good Luck.—At this quartz mine near North Cow Creek a 2-ft. ledge, assaying about \$10 per ton, has been cut at 250 ft. in the tunnel, and drifts have been started. The property is being developed by W. W. Morely and W. M. Dale.

Spread Eagle.—This group of 22 copper claims, on the copper belt that extends from Iron Mountain to the Little Backbone, has been purchased by the Scottish-American Development Company for \$125,000 to be paid in cash installments and 20% of the capital stock of the company.

Texas Mining Company.—This company is now shipping from 30 to 40 tons of ore per day to the

Keswick smelters. The returns are said to be satisfactory. The ore is transported to the railroad by a ¼-mile bucket tramway across the Sacramento River. The working shaft is down 1,100 ft.

Tuolumne County.  
(From Our Special Correspondent.)

Black Oak.—At this property, west from Soulsbyville, another agitation plant is now used to treat high grade sulphurets. The runs show an average saving of 97%. The 11th level extended 360 ft. north of the shaft shows high grade ore the entire distance, the face being 11 ft. in width, assaying, it is said, over \$50 per ton in gold and silver. The shaft now down 90 ft. below No. 11, will probably reach No. 12 by July 1st.

Four Oaks.—The main shaft is down 200 ft., where a station is being cut. This shaft and the drifts are all in ore. Rich croppings have been found about 400 ft. from the present opening. C. S. Shafer is superintendent.

Mazzeppa.—The annual report of the superintendent shows the shaft to be down 515 ft. and that in drifting, crosscutting and upraising 1,134 ft. of excavations have been made. At the 300 ft. level the vein will mill an average of 12 ft. in width. The 100 ft. level has been extended south 66 ft., making a total of 136 ft. On the 200 ft. a level has been run south 285 ft. on the vein. A crosscut has been made south on this level showing the ledge to be 30 ft. wide; 215 ft. south of the shaft an upraise is being made to connect with the 100 ft.; 250 ft. from the shaft a crosscut west shows the vein to be 20 ft. wide. From the 300 station a drift has been run south 325 ft., at 225 ft. an upraise is being made for ventilation and stoping. A station has been cut at the 400 ft. and a crosscut run east 202 ft., cutting 2 veins lying east of the one now worked. On the 500 ft. a drift is now in 107 ft.

Yuba County.  
(From Our Special Correspondent.)

Blue Point.—This placer mine at Smartsville is worked by a San Francisco company under a 10-year lease. A permit has been given by the Debris Commission to ground sluice into the canyon where a retaining dam has been constructed. When uncovered the blue lead will be worked from an open pit and milled in specially constructed mills run by water power. The ground is said to average 50c. per ton.

#### COLORADO.

Boulder County.

Colorado.—This old mine, of Ward District, has passed into the hands of a New York company, which will put it in condition. The Colorado at one time was a heavy shipper of high grade ore. It has been idle for several years and the shaft, 165 ft. deep, is full of water. The company has taken the property under bond and lease from John Rice, and is now engaged in taking out the water. George E. Brinker is in charge.

Lake County—Leadville.

(From Our Special Correspondent.)

While Leadville has no stock exchange there is much activity in local stocks and daily sales average 15,000 shares per day. The stocks are mostly downtown propositions.

Ballard Mining Company.—The ore body continues to get larger, while the stuff averages 2 ozs. gold to the ton. Shipments average 30 tons per day. The ore body has been developed for over 400 ft.

Fidelia Mining Company.—Lessees are sacking some very good ore from the old workings and have started a new shaft.

Garbutt.—Lessees are developing a fine streak of copper ore which runs very good in gold.

Home Mining Company.—The annual reports show a healthy condition of all 3 claims, with the likelihood of keeping up the steady production of 400 tons per day. Manager Bohn also advised sinking a new shaft, which will probably be done. This week some of the usual rich streaks of chlorides were opened up in the Starr workings. While not extensive, these generally run about 50% silver. At the Penrose the new hoisting plant is in position and the output of 225 tons a day can be increased.

Ibex Mining Company.—About 250 to 300 tons per day of sulphide and silicious ores is the present production. A large amount of prospecting work is also under way, the company having 18 machine drills in constant use.

New Elkhorn Mining Company.—Manager Kelly, of Elkhorn, Mont., is now in the city with a view of starting work. The company owns some good property in Big Evans Gulch which has been closed down several years.

New Leadville Mining Company.—The matter of combining with the Home Mining Company was not brought up at the annual meeting of the latter company owing to opposition. Just what the Leadville Company will do has not been decided upon. Messrs. Maxwell, Boehmer and Meyer are at the head of this company.

Prudential Mining, Milling and Mercantile As-

sociation.—This new company has been formed with a capital stock of \$50,000. Incorporators, M. D. Sullivan, John O'Malley, C. R. Burr, Jas. Grant, M. McGinley, Jas. Renfrew, Patrick Cleary, F. J. Moore and H. McGinn. The concern is the outgrowth of certain ideas formulated at the recent State convention of the Western Federation of Miners.

Rattler Group.—Geo. F. Champion has started a tunnel property which has been idle several years. The outcrop shows evidence of good mineralization.

Toledo Avenue Mining Company.—This company, with 80 acres of ground immediately adjoining the Home territory, has started a new shaft on the Humboldt ground.

Valentine Mining Company.—Sinking on the old shaft has been resumed. Three hundred ft. should put it into contact.

Wolcott Mining Company.—Thos. Bowden has secured a lease on the Newell claim and opened up a very good silver lead oxide ore, from which shipments average 300 tons a month.

Mineral County.

Amethyst.—This mine is worked by the owner company and is in charge of L. E. Campbell, managing director, and Cyrus Miller, superintendent. It is the heaviest shipper at Creede.

Happy Thought.—This mine, in charge of F. E. Wheeler, is sinking a shaft to the level of the Wooster Tunnel, having sunk about 1,250 ft. and having about 550 ft. deeper to sink to strike tunnel level.

Solomon.—This mill, on Willow Creek near Creede, is equipped with crushers, rolls, jigs and Wilfley tables, and is in charge of J. A. Smith. About 40 tons per day are concentrated. The ores are somewhat silicious and the sulphides considerably oxidized.

United.—These mines, next to the Amethyst, are worked under lease to the Big Kanawha Leasing Company, of which H. C. Rowley is superintendent.

Ouray County.

Atlas.—This mine, which adjoins the Revenue at Ouray, is reported sold by the owners, C. N. Carroll and Benton Canon, of Denver, to the Caroline Mining Company. This property has shipped a rich ore and is supposed to be on a vein connecting with the Revenue.

(From Our Special Correspondent.)

American Nettle.—Contractors expect to have the new American mill near Ouray running by August 1st. The buildings are about completed and the tramway is in operation.

Bright Diamond.—Griffith Brothers are shipping 5 carloads per month from their lease on this property, consisting of pyritic iron carrying good values in gold.

Little Rose.—Allison & Graff have a force of men at work on good ore in the Little Rose and are shipping 3 carloads per month to Denver smelters.

San Juan Chief.—Chicago owners of the Ouray Mine are getting things ready for the season. The company is negotiating for several properties located in the gold belt and will invest considerable capital developing them this summer.

Trout & Fisherman.—Childers & Wilson have purchased Jackson's lease on this Ouray property and are making occasional shipments of high-grade gray copper ore.

San Miguel County.

San Juan Gold Mining Company.—This company's 200-ton cyanide plant in Gold King Basin, in operation about 1 month, at the last clean-up gave a retort weighing about 45 lbs., estimated by some to be worth \$10,000. This was from 600 tons of ore. The best mineral is not yet treated, as it has been held until the plant is operating smoothly. The mines are known as the Bessie Group, and it is reported that on the Little Sioux vein, an extension of the Gold King, there is 3 to 4 ft. of \$30 ore, exclusive of the lower grade, which runs from \$8 to \$14. Senator W. S. Buckley is western manager.

San Miguel Mining and Investment Company.—This company has purchased the Blue Lake in Bridal Veil basin and will construct a large power plant for the operation of its property in the basin. The company owns 25 claims, 250 acres altogether. There is a fine fall from the lake to the mines, and the estimate is that 1,000 H.-P. can be generated. The proposition now is to commence the erection of a plant of 250 H.-P.

Smuggler-Union Mining Company.—This company is building a new tramway from its mills at Pandora to the Pennsylvania tunnel. For 4 or 5 months, or since the starting of the new mill, the mines have been producing 13,000 tons of mineral per month, and it is reported this will be increased to 16,000 tons. The Pennsylvania tunnel is being run on the Pennsylvania lead, which crosses the Smuggler-Union at an angle of 15°, and when it reaches the latter vein the trip to the mine will be short. The intersection will be 700 ft. below the Bullion Tunnel level, and will render available large areas of stoping ground. The 2 tunnels will be connected by an upraise or shaft, and a part of

the Smuggler-Union product will be sent over the new tram. In the Pennsylvania there is a large body of ore running higher in gold than the Smuggler-Union, upon which stoping will begin when the new tram is ready. The company employs over 500 men. Arthur L. Collins of Telluride is manager.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

Anaconda Gold Mining Company.—It is understood that the notes against the company have been bought by J. T. Milliken, of St. Louis, and associates, and that the control of the stock is owned by these gentlemen. The program now is to form a new company. The old company has a capitalization of \$500,000, 1,000,000 shares of the value of \$5 per share. The new company will have a capitalization of \$2,000,000, 2,000,000 shares of the value of \$1. The stockholders are to exchange a share of the old stock for one of the new. This will take 1,000,000 shares and the balance of the stock will be for the repayment of the indebtedness and treasury stock. The debt of the company is now about \$125,000. The consent of 2/3 of the stockholders is necessary for the reorganization. If this is not secured the property will be sold by the holders of the notes to protect themselves.

Good Will Tunnel.—Work is being pushed on this tunnel in Gold Hill, which is now in about ½ a mile, with a depth of about 600 ft. below the surface of the ground. The tunnel is being run chiefly as a drainage and transportation proposition. Mr. Wm. Weston is the promoter and manager of the enterprise.

Independence Town and Mining Company.—In spite of all the wild rumors afloat there is no doubt that Secretary of the Interior Hitchcock has recommended that the Attorney-General bring suit in the United States Court against the owners of the Hull City placer to annul the patent on the showing of the Wilson Creek people that the patent was obtained by fraud. The Hull City placer was patented in 1898, after an immense amount of litigation. The Wilson Creek people claim the ground within the lines of the placer and bring numerous charges of fraud against the placer people. An immense amount more of litigation is certain.

Portland Gold Mining Company.—This company, commencing in July, will pay quarterly instead of monthly as heretofore. This will make a distribution of \$180,000 per quarter. The dividend of the Independence Company has been passed, presumably on account of the extra expense involved by the litigation.

#### IDAHO.

Custer County.

Red Bird.—This mine, near Clayton, has been worked to 400 ft. depth. The ore is iron carbonate carrying silver and lead values, said to run \$70 per ton. The smelter is at Clayton.

South Butte.—Pat Wagner, a veteran miner, is reported to have struck 3 ft. of galena and carbonate ore carrying good silver values on this claim near the Red Bird.

Deer Lodge County.

Montana Mining Company, Limited.—The total output for May was: Gold, 2,770 oz.; and silver, 12,440 oz., obtained from 4,500 tons of ore crushed in the mills, and 12,539 tons of tailings from the dams. The estimated realizable value of the produce of crushings is \$20,700, and of tailings, \$41,500. Treatment of 12,539 tons of tailings cost \$14,411. The total estimated returns is \$62,200, and expenses were \$44,800. Estimated net profit, \$17,400.

Shoshone County.

A strike of 7 ft. of ore is reported on a claim on Pine Creek, below Wardner, 5 ft. of which is shipping ore and 2 ft. concentrating. The postmaster at Kellogg is said to be one of the owners of the claim.

Darling Group.—H. L. Phillips, who is managing the Pacific Mining Company's affairs on what is known as the Darling Group of claims in the carbonate belt on the south side of Prichard Creek, 7 miles east of Murray, has struck, it is said, a large body of carbonate and galena ore either in the Bluebird claim or a claim adjoining.

Paragon.—A strike of galena is reported at this claim, near Sullivan. Mr. Stedman is manager.

#### KANSAS

Coal Miners' Wage Scale.—Labor disputes in the southwest coal field are now practically ended by an agreement between miners and operators at Pittsburg, which practically settles the strike for one year at least. The agreements for the Osage County and Leavenworth district were also signed. The life of the agreements are from year to year on September 1st. The miners have gained an average raise of about 20c., and each company has reserved the right to discharge any miner or miners whose net run of 2,000 lbs. of run of mine coal will not yield the same percentage of lump coal as that produced when the mines are operated on the screen coal system. "Dead work" is to be paid for at the rate of \$1 and \$1.50 per yd.; brushing, 80c. per yd. for 4

ft. above rail and \$1 per yd. for 6 ft. above rail; shot firers, \$2.65 a shift; machine men, track-layers and timber men, \$2.25 a day; top men, \$1.55 a day; drivers, from \$2.05, with 25c. for each extra mule; digging, 65c. a ton. Eight hours shall constitute a day's work, and no distinction will be made between union and non-union men.

## MICHIGAN.

## Copper—Houghton County.

(From Our Special Correspondent.)

Calumet & Hecla.—The Red Jacket shaft is being steadily unwatered. There were 1,100 ft. of water in the shaft when work was commenced. Four large bailers are used, 2 of which contain 2,000 gals. each and the other 2 contain 1,000 gals. each. Work has been resumed in all except 3 shafts.

## Copper—Keweenaw County.

(From Our Special Correspondent.)

Phoenix Consolidated.—This mine is being opened up once more. Mining was done as early as 1844 and in the following years a mass weighing 600 tons was taken out. In 1877 a dividend amounting to \$20,000 was paid.

## Iron—Menominee Range.

The Oliver Mining Company has reduced wages at many mines in the Crystal Falls region. The biggest cut was in the wages of the men employed at the explorations.

Bristol Iron Company.—J. T. Jones is interested in the transfer of the lease of the Appleton Mine at Loreta. The company will unwater the Appleton and do some work looking toward the purchase of the property. Gordon Murray will have local charge.

Crystal Falls.—This mine at Crystal Falls is producing about 1,000 tons per day through one shaft.

Great Western.—This mine at Crystal Falls is not doing as well as was expected from the fact that the ore which was opened up to stope is not wanted by the sales agents at present. The east shaft is closed and all the ore that is hoisted comes from the west shaft.

## MINNESOTA.

(From Our Special Correspondent.)

In a case brought by the county of St. Louis against H. M. Bradley, part owner of the fee to the Chandler Mine, at Ely, claiming the right to tax royalties on the ore mined, the District Court decided that royalties are not taxable. The property is taxed as real estate and the lessee is under obligations to pay all taxes, so the court ruled that the fee holder is subject to no tax. The State Auditor reports that since the enactment of the mining law in 1890 there have been paid to the commonwealth the sum of \$616,000 on its account. Of this \$500,000 has been for the royalty of 25c. per ton, and the remainder for mining leases and contracts. Comparatively little ore has been mined from State land, except at the Oliver, but large deposits have been recently discovered that will add greatly to the income of the commonwealth. A large number of mining contracts have been taken out recently, including land in section 16 T. 58, R. 19 to C. A. Congdon; land in sections 2 and 3 T. 58, R. 18 and section 11 T. 58, R. 19, to Alexander Maitland (Republic Iron and Steel Company); land in sections 10, 11, 16, 20, 21 and 30. T. 58, R. 19, to W. C. Sherwood; land in 1, 10, 12, 15 and 16, T. 56, R. 23, to Wm. Robinson; land in sections 3 and 11, T. 58, R. 18; section 6, T. 58, R. 17, and section 4, T. 57, R. 21, 36, T. 63, R. 16, to Miller et. al.; land in section 16, T. 63, R. 10, to W. T. James.

## Iron—Mesabi Range.

(From Our Special Correspondent.)

Drills are at work on the Thomas lands, in the south side of T. 57, R. 19, close to the Fay and Saunry Mines. On one 40 of these lands 8 pits are bottomed in ore.

Several new mines have begun shipments, including the Stevenson, to which a road has been built by the Eastern Minnesota Company; the Clark of the American Mining Company, whose product also goes over the Eastern Minnesota; and the Malta, which is practically a new mine operated by Pickands, Mather & Company, and shipping over the Duluth & Iron Range road.

The drill hole on the new school house site, at Hibbing, was in lean ore from 90 to 118 ft., then went into merchantable ore and is still in it.

Alfred Merritt is again exploring the northeast ¼ of section 10, T. 58, R. 18, south of the Mountain Iron Mine, where he found ore last winter.

At the new explorations in the southwest part of T. 59, R. 14, the Minnesota Iron Company has found ore at the Mesaba townsite, section 21, and Kinney & Shannon have found it in 29.

Duluth.—This mine has laid off its night crews and is running single shift.

Fay.—The 1/3 interest in the 30c. and 35c. lease on this land, in sections 4 and 5, T. 58, R. 17, belonging to H. Roberts, of Duluth, has been sold to Samuel Mather, of Cleveland, for \$50,000, and the Duluth & Iron Range road is building a 2¼-mile track to the mine. It is supposed that

the purchase was in the interest of the Minnesota Iron Company. For the other 2/3 of the leasehold interest \$60,000 were paid some weeks ago. The ores run about 62 to 63 iron and very low in phosphorus, from .009 to .020. The ore is coarse and lumpy. The land covers 200 acres, the fee to 160 of which is in A. M. Miller, and of 40 in W. C. Yawkey, owner of the fee to several good mines, including the Commodore.

Hale.—Five men were killed by a blast at this mine, at Biwabik, last week. This is the most serious accident of the kind that has occurred on the Mesabi range.

Mahoning Ore and Steel Company.—This company, with 3 shovels loading ore, has shipped in one day 13,000 gross tons, or 361 car-loads. Of these 116 were 50-ton cars, the balance about 27 tons. During the day there was a delay of about 90 minutes waiting for cars. The ore had, of course, been stripped for mining, but was not otherwise prepared, except that charges of black powder had been used to loosen it up for the shovels.

McGregor Iron Mining Company.—This company has a lease of land in section 31, T. 58, R. 20, and has put a diamond drill at work. The same company is also putting a drill on section 12, T. 58, R. 18, on the Christianson lands.

Mesaba Iron Company.—This, the original mining land concern of the Mesabi range, has given an option on its 9,000 acres in T. 60, R. 12 and 13, for a sum approximating \$300,000. There are large outcrops of ore on these lands, but the iron shown has contained injurious impurities, chiefly titanium, and has been unsalable. Examination and tests will be made this summer.

Williams.—This property of the Duluth Furnace Company has closed indefinitely, but will probably resume with a changed condition of the market. The ore is not high grade.

## MISSOURI.

## Jasper County.

(From Our Special Correspondent.)

New Incorporations.—The following are noted: Joplin Lead and Zinc Union, capital \$500,000; don, Conn.; J. H. Matlock, Brooklyn, N. Y.; J. H. Sargeant, Chicago, and Chauncey Matlock, Brooklyn, N. Y. The Missouri Land and Mining Company, capital, \$100,000; incorporators, James H. Huston, Indianapolis; A. Wiswall, Boston; Thomas H. McKee, Washington, D. C.; F. S. Bassett, Woburn, Mass.; C. P. Matlock, Portland, Me., and E. M. Sanger, of Boston, eastern manager. The Bassett Mining Company, of West Virginia, capital \$100,000; incorporators, F. S. Bassett, Woburn, Mass.; E. M. Sanger and A. Wiswall, Boston, Mass. The White Rose Mining Company, capital \$250,000, one-half of which is fully paid; incorporators, J. Y. Jones, G. N. Rexroad, T. H. Garlick, B. A. Tatum, G. B. Garlick and B. F. Tatum, all of Springfield, Mo. Zinc Mining Company, Joplin, capital \$100,000; C. M. Gregory, Cotton Falls, Mo., president. Crane Lead and Zinc Mining Company, capital \$200,000; W. S. Crane, Carthage, president. Prairie Lead and Zinc Company, capital \$80,000; P. E. Hannum, Carthage, Mo., president. Grand View Mining Company, St. Louis, capital \$30,000; incorporators, H. J. Santwell, H. M. Noel, W. F. Carter and E. H. Wagner, all of St. Louis. The Argo Mining Company, Cartersville, Mo.; capital \$50,000; incorporators, A. A. Cass, W. B. Kane, J. W. Frey, W. A. Daugherty and E. C. Devore, all of Cartersville.

## MONTANA.

## Beaverhead County.

Montana Copper and Gold Mining Company.—This concern, organized under Wyoming laws with \$1,000,000 capital stock, has as incorporators W. H. Carter, N. W. Hull, J. W. McCoy and A. B. Ballou, of Chicago, and H. A. Hull and A. A. Manser, of Dillon. The main office of the company is at Chicago and the Montana office at Dillon. The concern controls 6 very promising copper claims in the Stone Creek district. A. A. Manser is in complete charge of the development work, and preliminary steps have already been taken to sink a shaft along the lead to water level.

## Jefferson County.

Park Canyon Mining Company.—This company, of which George Robertson is superintendent, representing eastern capital, has taken up work on the Homestake Mine. The company has recently purchased the 2/3 interest owned by Con Sullivan and the 1/3 held by the Basin & Bay State Mining Company. The Basin Company acquired this interest through the Glass Brothers. The new owner has already started mining.

## Silver Bow County.

At all the mines controlled by W. A. Clark or F. Aug. Heinze the men are now working on an 8-hour day. This step aroused much enthusiasm in the labor organizations at Butte and it is reported that they will take steps to have the 8-hour day applied to all properties at Butte, including particularly those controlled by the Amalgamated Copper Company.

The concession of an 8-hour day was made in response to a long standing demand of the

miners. Heinze and Clark employ about 2,000 miners; the Amalgamated about 5,000 in the properties it controls. Both Heinze and Clark are absolute masters of the mines they operate, but the managers and superintendents of the mines controlled by the Amalgamated are powerless to grant the reform sought for. Superintendent O'Neill, of the Anaconda, stated that the Amalgamated properties would be closed rather than the demands of the miners be granted. An 8-hour day already exists in Utah and in British Columbia.

Emma.—M. C. Harris & Company are working this mine, located in the southern portion of Butte. An electric hoist and pump have been installed on the ground and the shaft that was down 100 ft. when the company took possession has been sunk an additional 50 ft. and work is still in progress. The property is a vein of lead ore.

Montana Ore Purchasing Company.—The company for the first time since March, 1897, is working the Pennsylvania vein through the Rarus shaft. The matter of working that lead has been tied up in litigation. The suit was one of the first instituted in the large file of cases pending or tried between the Montana Ore Purchasing Company and the Boston & Montana Company. Almost continuously since 1897 the company has been enjoined from working what is commonly called the Pennsylvania vein. Twice cases involving the ownership of the lead have been in the United States court of appeals in San Francisco and each time in that court the injunctions levied have been dissolved.

The Supreme Court of Montana on June 13th finally dissolved the injunction in the Pennsylvania-Rarus-Johnstone suit. F. A. Heinze was ordered to put up a bond of \$400,000 pending the final decision on appeal to the Supreme Court from the decision of Judge Clancy, of the District Court, in favor of Heinze.

As the Supreme Court docket is 2 years behind, the appeal most probably will not be heard for 2 years. Meanwhile Heinze has already put 400 men to work in this mine, and has ordered more blast furnaces for his smelters to treat this increased output.

Smokehouse.—Work at this lode in Butte is being pushed rapidly by Alex Tarbet, the virtual owner. Work was suspended for a time on account of the great volume of water. The men are cutting through the north ledge and recently exposed about 2 ft. of the ledge, the quartz of which carried a fair percentage of gold and silver and was stained with copper. The shaft is only down 200 ft. and is to go down 500 ft.

## NEW JERSEY.

## Somerset County.

American Copper Mining Company.—This New York City company is erecting a 100-ton copper concentrating plant at the old mine near Somerville, N. J. W. P. Swarts, late of the Edw. P. Allis Company, of Milwaukee, designed the plant, and is consulting engineer for the American Copper Company. The plant is expected to be in operation before August 1st next.

The ore as taken from mine is found principally in the trap rock. Seams of native copper are found frequently and carbonate and oxide of copper occur. It is intended to treat the oxides and native copper by concentration; the carbonates by leaching by dilute sulphuric acid and depositing on scrap iron. The fine dust will be screened out before leaching.

## Sussex County.

Allen Granite and Construction Company.—This company purposes putting up a large crushing plant at its new quarry near Waterloo. The company has some large contracts on hand and in prospect.

## NEW MEXICO.

## Bernalillo County.

At the Colorado Coal and Iron Company's coal mine at Gibson 2 miners were killed by an explosion recently.

## Dona Ana County.

(From Our Special Correspondent.)

Modoc.—The new owners of this mine are getting out ore for shipment to the El Paso smelter. A large amount of development work has been done and the management expects to be able to make regular shipments hereafter. The mine is located about 6 miles from Organ.

Orion Mining Company.—A carload of high-grade ore from this company's Dundee mine at Lordsburg has arrived at the El Paso smelter and another car load is to follow. The company has completed the main shaft on the Dundee, 100 ft., and drifts on the vein in both directions have been driven 40 ft. in ore.

## OREGON.

## Baker County.

North American Mining Company.—This company claims to have 25 men at work on its property, 18 miles north of Baker City, where are said to be some lodes carrying free copper. Mr. Burke of Chicago is president and manager.

Lane County—Bohemia District.  
(From Our Special Correspondent.)

**Champion.**—This mine has been bonded by B. K. Worley of Tacoma. It has been idle during the past year and has not paid on account of poor management. There is a 10-stamp Hammond mill and a 3,900-ft. tramway by the same maker on the property. Mr. Worley will start the mill as soon as the property is in good shape.

**Lucky Boy.**—A very fine streak showing wire gold has been found in the second level. The streak is about 4 in. wide and your correspondent has seen a specimen full of gold wires 3 in. long. Work will be continued in the 3d level as soon as the sawmill is at work.

**Knott.**—This property, the oldest in the District, was equipped with a small 5-stamp mill in 1876 and \$1,700 was milled in the first 36 hours the mill was run. The property was closed down in 1878 and has not been operated since because of litigation between the heirs of the Knott estate. Mr. Douglas Ladd, of Portland, will shortly put men at work and with modern machinery this old mine is expected to be one of the best producers in the district. The mine was patented in 1877 and has a shaft 75 ft. deep and about 500 ft. of tunnel.

**Montana Mining Company.**—This company, owned by Reed & Larrabee Brothers of Montana, has carried on extensive work, 900 ft. of tunnel being driven on the Laura F. claim alone during the past winter.

PENNSYLVANIA.

Anthracite Coal.

It is stated that the general stores connected with the mines of the Temple Iron Company will close on July 1st, and after that date the employees of the company may buy their goods where they please.

The new breaker just completed by the Philadelphia Coal, Iron and Railroad Company, at Locust Gap, is one of the largest in the region. A railway siding is now being laid into the breaker, which will soon be in operation.

**Williams.**—This colliery, at Pottsville, which suspended operations last spring, has resumed, giving employment to 500 men and boys.

**William A.**—An attempt recently made to settle the strike at this colliery, at Duryea, which has been on for 3 months, failed.

Bituminous Coal.

(From Our Special Correspondent.)

A test hole drilled near Oakdale, below Dawson, on the Baltimore & Ohio Railroad and the Youghiogheny River, shows that there is cannel coal in that vicinity. Several years ago the Connellsville White Sand Company was organized in Connellsville to work the Speer White Sand Company, whose plant was located south of Connellsville. For a time the plant was operated, and then the company bought between 200 and 300 acres of land at Oakdale, which contained sandstone, suited for railroad sand. The company finally reorganized with Rockwell Marietta president, A. W. Soisson secretary and W. F. Soisson treasurer. Other stockholders were Joseph D. Madigan, W. A. Davidson, George J. Humbert and others of Connellsville. After the sandstone had been worked some time, the company determined to test for coal with a diamond drill. At 57 ft. a 4-ft. vein of fine cannel coal was found. Samples of coal sent to Stewart Marshall of the Dunbar Furnace Company of Dunbar showed, it is said, not more than 1% of sulphur and high fixed carbon. The company kept on drilling and is now down 265 ft. to learn if there is a second vein. Just below the cannel coal is a bed of fine fire clay 12 ft. 4 in. thick, which can be worked in conjunction with the coal. It is now profitable to work fire clay in mines instead of "peeling" and "stripping," as by headings the clay can be mined all the year around.

**Cambria & Clearfield Coal and Coke Company.**—Messrs. Widener, Elkins and Magee, who recently purchased of John Dean and his partners the entire town of Frugality, Cambria County, with its surrounding coal lands, have gone over the ground and authorized the expenditure of a large sum this summer in extending the operations of this new concern. They have nearly 1,000 acres underlaid with coal which have never been worked.

**W. D. Bigler** recently paid out over \$30,000 for land in Canoe Township, Indiana County. The Glenwood Coal Company is rapidly extending its railroad line into territory recently acquired, known as the Long tract. Agents of the Buffalo, Rochester & Pittsburg Railroad Company have paid out \$20,000 for coal lands in the vicinity of Indiana. The Horton Run Coal and Coke Company is putting up 20 new houses for miners in Montgomery township, where it has opened new mines. A block of 5,000 acres has just been purchased in Green Township.

Slate.

(From Our Special Correspondent.)

**Acme and Alpha.**—These two quarries, at Wind Gap, are to be operated by a new Bangor company, headed by Conrad Miller, who is

president; Dr. J. H. Shull, secretary; Charles Shuman, treasurer; Kirk Real, general manager, and A. I. La Bar.

**Aetna Quarry.**—The American Slate Company, under the superintendence of John Masters, will soon erect a factory at Pen Argyle.

**Bangor Union Slate Company.**—The newly-elected officers are: President, Conrad Miller; vice-president, C. N. Miller; secretary, W. H. Vail; treasurer, A. M. Paff. These and D. C. Blair, Thomas Ditchett, Jacob E. Long and N. N. Betz constitute the board of directors.

**Enterprise Slate Company.**—A new quarry is being opened a short distance from the old one at Lynnport, in Lehigh County.

**Proctor Brothers** are working a new quarry near South Delta.

**Royal Slate Manufacturing Company.**—With a \$125,000 capital stock this company has been incorporated to work property at Wind Gap. Interested parties are Charles D. Champ, Harlem P. Hess, Louis A. Kerlich and S. C. Smith. The principal office is in Phillipsburg, N. J.

UTAH.

(From Our Special Correspondent.)

The Salt Lake office of the Consolidated Kansas City Smelting and Refining Company, which handles cyaniding products of the inter-mountain region, is to be known as the branch office of the Argentine plant of the American Smelting and Refining Company.

**Bullion and Ore Shipments.**—In the week ending June 9th there were sent forward from the different smelteries 22 cars, or 939,346 lbs. lead-silver bullion; 5 cars, or 268,454 lbs. copper bullion. In the same week there were shipped to smelteries outside of the State from several camps 52 cars, or 2,381,130 lbs. of ore and concentrate products. Corrected figures for the shipments for the prior week are: 23 cars, or 980,853 lbs. lead-silver bullion; 4 cars, or 208,137 lbs. copper bullion. Ore sent out of the State for treatment, 120 cars, or 4,947,240 lbs. and 1 car of copper ore of 80,400 lbs. During the week ending June 16th there were forwarded from the different smelteries 20 cars, or 845,300 lbs., lead-silver bullion; 5 cars, or 243,278 lbs., copper bullion. In the same week there were shipped to smelters outside of the state for treatment 107 cars, or 4,252,050 lbs., of lead, silver, gold ores and concentrates, 1 car, or 38,650 lbs., copper ore, and 3 cars, or 140,000 lbs., iron ore for flux.

**Lead Ore Prices.**—All this week lead in ores has been settled for on a \$3.77½ New York basis. As yet this has not affected ore production.

**New Smelter Site.**—It is announced that the American Smelter & Refining Company has just bought ground adjoining the Mingo plant at Sandy, sufficient to make 100 acres altogether. Mr. A. Raht affirms it is the intention to build the world's most complete smelter in Salt Lake valley.

**Lead Producers to Organize.**—At Salt Lake, on June 5th, a meeting of lead producers was held to take preliminary steps toward forming a combination, in connection with owners of lead mines in other States, to uphold the price of lead. Mr. J. E. Bamberger, who issued the call, stated that lead producers in Idaho, Montana, Colorado and Missouri were organizing for the same end. The plan is to have a central organization in New York to buy the surplus lead and market the same outside of the United States. It was explained how the American Smelting and Refining Company and a few large lead producers had maintained the lead market for over a year and that the recent drop was brought about because the Missouri lead producers persisted in refusing to bear their share of the burden. Messrs. J. E. Bamberger, A. Hanauer, Thomas Kearns, Jesse Knight and C. F. Loofburrow were appointed a committee to draw up a plan of organization. A second meeting was held the evening of June 9th and it was decided that dues to be paid by the mines shall be upon the following basis: "When the settling price for the metallic lead contents in the ore is \$4.25 per 100 lbs., then the dues shall be \$1 per ton on the metallic lead contents in said ore. When the settling price is \$4.50 per 100 lbs. the dues shall be \$2 per ton on the metallic lead contained in said ore. When the settling price is \$4.65 or more per 100 lbs., then the dues shall be \$3 per ton on the metallic lead contained in said ore." Messrs. Thomas Kearns, C. E. Loose and J. E. Bamberger were appointed an executive committee to meet like committees from other States in New York. The sliding scale of dues to be paid by mine owners as the domestic lead market moves up and down will perhaps be changed for the Idaho plan, which purposes to maintain a flat lead price so far as concerns the western producers. Under this scheme, which has the approval of the American Smelting and Refining Company, 6 months' contracts are being signed to settle for the lead in Utah ores on a basis of \$4.12½ per 100 lbs. At this writing—16th of June—most of the large lead producers have signed these contracts and it will require but slight pressure to make it unanimous. By the Idaho plan lead mine owners need not form an unwieldy syndicate. On the other

hand they will not share in the probable profits, or possible losses.

Juab County.

(From Our Special Correspondent.)

**Tintic Shipments.**—For the week of June 16th the shipments from the 3 railroad points of the district were: 103 cars ore, 4 cars concentrates, and 2 bars of bullion, contributed as follows: Centennial-Eureka, 29 cars; Mammoth, 21 cars ore, 4 cars concentrates, 3 bars bullion; Gemini, 11 cars; Swansea, 6 cars; Bullion-Beck, 5 cars; Uncle Sam, 5 cars; Godiva, 4 cars; May Day, 4 cars; Showers, 4 cars; South Swansea, 4 cars; Carissa, 3 cars; Grand Central, 3 cars; Ajax, 2 cars; Four Aces, 1 car; Lower Mammoth, 1 car.

**Bullion-Beck.**—A shaft is down 50 ft. on the new lead-silver ore find at the south end of the property. Six carloads have been shipped. It gives promise of proving a new ore zone of merit.

**Eureka Hill.**—On July 1st the mill will begin to drop 60 stamps and handle about 200 tons daily. John J. Pilgerrim is to have charge.

**Grand Central.**—Again there are more rumors of a settlement of the suit against the Mammoth out of court.

**Swansea.**—At the company's office in Salt Lake City, on June 18th, the annual meeting was held, resulting in the re-election of the old directorate and officers. The report of General Manager Theron Geddes showed that during the year 12,262 tons of ore were shipped, which contained 478,700 oz. silver and 1,985,680 lbs. lead, or an average per ton of 40 oz. silver and 8.32 lbs. lead. Receipts from ore were \$208,946, an increase of \$55,857 over last year, or 36½%; expenses, \$82,165, or an increase of \$19,298, or 30.7%; net earnings, \$130,872, an increase of \$36,559, or 40½%; average amount per ton received from smelter, \$17.52, against \$14.45 for prior year; net receipts per ton \$10.82, against \$8.52. Increase in expense per ton over last year is largely due to a liberal charge for renewals, greater cost of mining at depth and pumping charges. Amount of new development in year, 1,735 ft. of drifts and crosscuts, raises 312 ft., winzes 67 ft.; total 2,112 ft. Some 1,000 ft. of drifts and crosscuts were run on 850-ft. level, exposing ores of shipping value, but were limited and of lower grade than above. Production for past 12 months was almost entirely from stopes above 650 and 550 levels. There are liberal reserves above 750 level, and considerable shipping ore yet above 650 level. New equipment consists of 100 H.-P. engine, 125 H.-P. boiler and pumps. Dividends paid made a total of \$70,000, which left a surplus of \$61,871 carried to profit and loss account.

Piute County.

(From Our Special Correspondent.)

**Annie Laurie.**—Manager L. C. Huck and Superintendent Filer are at the mine. Mr. Huck states that orders are placed for all machinery and material for the 150-ton cyaniding mill. When this equipment is complete the expenditure all told will foot up \$1,000,000. It is expected that the power plant and mill will be in commission by January 1st.

**Sevier.**—A few days since the vein was cut in lower tunnel. At annual meeting on June 14th the old directorate was re-elected.

**Sevier-Holland-Connor Groups.**—W. F. Snyder, who placed the Annie Laurie and Snyder Improvement Company's holdings with the Kimberley-Huck syndicate, has gone to Chicago and New York to open negotiations to transfer the Sevier, Holland and General Connor holdings.

Salt Lake County.

(From Our Special Correspondent.)

**Bingham Copper and Gold.**—Manager O. E. Posey, Treasurer O. E. Weller, Metallurgist W. H. Nutting and Duncan McVichie passed several hours under ground 2 days ago, guided by Superintendent Heffron. An additional 6-drill compressor is to be installed and a contract is being made with the Salt Lake Water and Electric Power Company for 75 H. P. to be supplied from the Jordan Narrows plant. Superintendent Heffron has conducted affairs without splurge, differing thus from other undertakings not 1,000 miles distant.

**City Rock.**—About 90 tons of good grade ore were shipped last week from this Alta property, the result of 2 men's work during the winter. William Green, the custodian of the mine, has made handsome wages.

**Dalton & Lark.**—On June 11th the payment due under the Farnsworth option was made. This probably assures the transfer.

**Fortune.**—The first regular run of the concentrating plant began June 14th. Manager Elmer Hill is receiving congratulations.

**Shawmut.**—The mill equipment is at a standstill, waiting for machinery which is long overdue.

**United States.**—Working force is reduced to 75 men, though it is said this number will soon be doubled. Duncan McVichie has again examined the mines, and it is surmised that he is about to assume charge, as general superintendent.

Utah Consolidated.—The caving system of mining works like a charm. The ore tonnage blocked out is ½ larger than in June, 1899.

Summit County.

(From Our Special Correspondent.)

Park City Shipments.—In the week of June 16th the total smelter products sent from the camp were 2,460,835 lbs., made up as follows: Silver King, crude 1,423,090 lbs.; Daly-West, concentrates 411,925 lbs.; Apex, crude 210,030 lbs.; Anchor, concentrates \$203,940 lbs.; Valeo, 211,350 lbs.

Apex.—On June 1st the Rookledge-Flindt lease expired and the owners took possession.

Clarissa.—Exploration is to be resumed. A tunnel is to be driven from East Gulch to cut the vein 200 ft. below collar of shaft.

Ontario.—Superintendent Chambers, on his first visit to the mine after the Crown Point suit, stated that the company would move for a new trial.

Tooele County.

(From Our Special Correspondent.)

Geyser-Marion.—It is said exploration on the lower vein has brought to light an ore chute carrying paying values.

Mercur.—On June 25th at the office of the company in Salt Lake City, will be held a special stockholders' meeting for the purpose of ratifying the union with the De La Mar's Mercur Mines Company. According to this special meeting call the Mercur Gold Mining and Milling Company is to absorb the De La Mar holdings and undergo a change of name to Consolidated Mercur Gold Mines Company and to increase the number of shares from 200,000 to 1,000,000 of a par value of \$5 each. The reorganized company will have 7 directors in place of 5. So far as can be gleaned no opposition to this plan is shown.

Northern Light.—Everything is about ready for the mill to start.

Sacramento.—Consignments of machinery for the wasting plant are beginning to arrive. It will be set up as soon as possible.

Wasatch County.

(From Our Special Correspondent.)

Valeo.—Several days ago some 6 armed men appeared at the mine and demanded privilege of going underground. This was denied and the visitors took possession. After going through the workings they departed, without doing any damage. Since then all sorts of yarns have been current as to conditions underground, and the company's shares have slumped.

WEST VIRGINIA.

Taylor County.

Flemington Coal and Coke Company.—At the annual meeting of the stockholders on June 15th in New York several representatives of new interests were elected to the Board of Directors, among them being H. E. Moller, L. T. Haggin, Joseph D. Redding, Andrew McKinney and I. T. Ramsay. Two more directors are to be chosen later who will be prominent in the Baltimore & Ohio Railroad.

The annual report shows a surplus for the year of \$692,180, as compared with a surplus of \$460,413 for the year ending April 30th, 1899. The output of the company has been increased from an average of 600 tons per working day to 1,000 tons. The stockholders authorized the issue of \$500,000 new stock to build a new coke plant and open up another part of the mine. A resolution was also adopted authorizing the directors to retire the present \$500,000 of 5% bonds which fall due in 10 years and issue in their stead an equal amount of 6% 20-year bonds, the latter to have a sinking fund attachment to be provided for by a charge of 7c. per ton on the coal mined.

WYOMING.

Carbon County.

Grand Encampment Smelter.—It is stated that Chicago men, headed by George E. West, of Denver, have completed arrangements to erect a 100-ton smelter at Encampment.

## FOREIGN MINING NEWS.

### ASIA.

India.—Mysore.

The output of the Colar District in May was 40,303 oz. gold. For the five months ending May 31st the total was 203,289 oz. crude, against 171,529 oz. last year, an increase of 31,760 oz., or 18.9%. The total this year was equal to 182,960 oz. fine gold, or \$3,781,783.

AUSTRALASIA.

New South Wales.

The gold output in May is reported at 17,636 oz. crude. For the five months ending May 31st the total was 141,434 oz. crude, against 144,408 oz. last year, a decrease of 2,974 oz., or 2.4%. The total this year was equal to 116,371 oz. fine, or \$2,405,384.

Western Australia.

The gold production for May is reported at 120,313 oz. crude. For the five months ending May

31st the total was 621,537 oz. crude, against 547,842 oz. last year, showing an increase of 73,695 oz., or 13.5%. The total this year was equal to 555,589 oz. fine, or \$11,484,249.

### NEWFOUNDLAND.

A strike has been on some days at the iron mines on Belle Isle, owned by the Whitney and the Fraser syndicates. The company refused the demands of the miners for increased pay and the miners threatened violence. At last reports the miners had agreed to load 2 steamships awaiting cargo at advanced rates, the wages to return to the old scale after this work was finished. A speedy collapse of the strike is predicted.

### SOUTH AMERICA.

Venezuela.

Orinoco Iron Company.—The court of the last resort at Caracas has given final judgment in favor of Mr. Turnbull, a citizen of the United States, as the only owner of the Orinoco iron mines, against the Roeder-Searles-Grant syndicate. The Orinoco Iron Company, a New York concern, obtained from the Venezuelan Government a concession for mining iron ore in a region extending 60 miles beyond Manoa, on the Orinoco River. The company began mining, but the legality of the grant was attacked by the Raleigh syndicate, an English combination. The Supreme Court of Venezuela decided in favor of the American concession. The Orinoco Company was capitalized at \$30,000,000, and, besides its iron mining interests, claims to own considerable rubber, forest and grazing lands and several gold mines. Albert B. Roeder is president of the company. Others interested are James E. York, Benoni Lockwood, Jr., Frederick Prentice and Adolph L. Roeder, of New York.

## COAL TRADE REVIEW.

New York.  
Anthracite.

June 22.

The anthracite market as yet shows little change from its condition of summer dullness. There is more heard of stocks accumulating and the independent operators, who usually bear the burden of any stories of cut prices, are reported to be making more liberal concessions. Still prices are pretty well maintained. It is doubtful, however, if the talk of advance on July 1st amounts to anything.

Business at all Western points is rather dull. Shippers to upper lake ports have succeeded in getting freight rates down 10c. and a heavier movement may be expected. The freight rates from Buffalo are now; Chicago 65c., Milwaukee 60c., Duluth 40c. At Duluth and in Chicago territory there is but little doing in the way of sales, though the situation at Chicago is improving. Some improvement is also reported at one or two Eastern points, notably Philadelphia, but at New York, Boston and the lower lake ports things are pretty quiet.

Scattered strikes continue at the collieries, but as yet there is no sign of any widespread disturbance. The lessening activity in the Connelville region is likely to check the outflow of labor to Western Pennsylvania, and at the same time diminish the chances of a general strike.

We continue to quote free burning white ash f. o. b. New York Harbor ports as follows: Broken, \$3@3.20; egg, \$3.20@3.40; stove, \$3.45@3.70; nut, \$3.45@3.70; pea, \$2.40@2.60; buckwheat, \$2@2.20.

### Bituminous.

The seaboard soft coal trade continues dull. There is a great deal of coal going forward, but the demand does not equal the immediate supply and prices are going down. Fair coal of the poorer grades can be bought for \$2.25 f. o. b. New York, and it is stated that there is considerable coal which can be had at this figure. It is even said that some coal has sold as low as \$2.15, but we cannot say how true this statement is.

The George's Creek strike is still on, but the men are getting restless and it is reported that the independent miners have asked for a conference with the presidents of the various companies, making this request as individuals and not as representatives of any organization.

In the far East trade is quiet. The larger consumers are looking about for bargains, and will fill up any spare room in their storage capacity this way. Along Long Island Sound, consumers seem to have all the coal they want and the demand is very light. At New York Harbor trade is fair but consumers have no trouble in getting some sort of coal to supply current needs.

Foreign trade is quiet; inquiries are less, for buyers and sellers are getting together. There are still inquiries, however, and continued shipments.

Transportation from mines to tide is fairly good, though many shippers report it slow to avoid trouble on account of coal hung up at the shipping ports. Car supply is good, but is limited by the room for coal at tidewater. In the coastwise vessel market rates are firm and vessels are in fair supply. We quote current rates of freight from Philadelphia as follows: Provi-

dence, New Bedford and the Sound, 65@70c.; Boston, Wareham, Salem and Portland, 85@90c.; Portsmouth and Bath, 80c.; Lynn, 90c.; Newport and Bangor, 90@95c.; Dover, \$1.15@1.20 and towages; Gardiner, 80@85c. and towages; Saco, \$1@1.15 and towages, with 10@15c. above these rates from Chesapeake Bay ports.

Birmingham, Ala.

June 18.

(From Our Special Correspondent.)

Of interest in Alabama this week is the coming scale convention of the coal miners, called for the purpose of making a new contract with the operators for the ensuing year, commencing July 1st. The convention will meet June 20th. To-day the operators of mines held a meeting and formed a temporary organization and appointed committees to confer with the miners during their convention two days later. There are some who believe that the contract which now exists will be re-enacted, while a few fear a strike.

The construction of new railroad lines by the Louisville & Nashville and Southern Railway through rich coal fields in Jefferson, Walker and Blount counties will cause the opening of a number of new coal mines in this State. State Mine Inspector J. DeB. Hooper will shortly make up a list of new mines which have been opened since January 1st. Up to June 13th there were only 17 fatal accidents in the Alabama mines during this year, against the same record last year and 29 in 1898. Though the number of mines and the production increased, the number of fatal accidents has not been increased, making good showing.

There have been no changes in the prices for the product.

Chicago.

June 19.

(From Our Special Correspondent.)

Anthracite Coal.—Prices and uncertainty combine to depress the coal trade at this point. Buying continues in small quantities, just enough for moderate wants, while inquiry is very light. Prices are presumed to be quite firm at \$5 for grate, \$5.25 for egg, stove and chestnut.

Bituminous Coal.—Sales are small in the aggregate, the buying being almost wholly of small lots and for immediate shipment. The receipts of soft coal continue large and the supply is beyond present requirements. Prices are made to sell coal and circular is apparently ignored.

Cleveland, O.

June 20.

(From Our Special Correspondent.)

Coal shippers again have it in their power to break the carrying rates away from Ohio ports, but have displayed no desire to do so. Buffalo this week has seen a drop all around of 5c. on carrying rates and it was confidently expected that Cleveland shippers would force the same sort of a change. So far they have failed to do so and, moreover, have suggested that such is not their present intention. The shippers are getting a liberal supply of coal from the mines, but it is not equal to the need for it. The season opened with the docks up above almost bare of coal, and the tendency prevalent all of this year is to ship coal up regardless of advance orders, the intention being to get plenty of it on hand to provide against another possible shortage such as was seen this year. The condition of the docks and the supply from the mines is all that prevents a much heavier movement, as there is an abundance of tonnage now with which to move the coal. Boats that are finding it difficult to get cargoes in either grain or ore are turning into the coal trade. The supply of tonnage is in excess of the demand. Carrying rates, however, remain as they have been from Ohio ports.

Pittsburg.

June 19.

(From Our Special Correspondent.)

Coal.—The expected rise in the rivers came this week and fully 8,000,000 bush. of coal were sent to Southern markets yesterday and to-day. All the available towboats were put in service as the rise was a temporary one and the work of getting the coal out had to be rushed. The stage of water only permitted the moving of barges which contain about 14,000 bush. each, and owing to the haste necessary only small tows were taken out. The coal boats, which hold 25,000 bush. each could not be taken out on the present stage of water. Nearly all of the tows are consigned to Cincinnati and Louisville, but many will go to points further south and some as far as New Orleans. But little coal is usually shipped to the latter point except in coal boats. The "barge water," as the present rise is termed by coal shippers, is the first fair stage since last December. There were a few scant stages since that time which permitted the shipping of barges that were not loaded to their full capacity. Over 15,000,000 bush. of coal remains loaded in the pools ready to go out when the rivers are again navigable. The Cincinnati market was short of coal until last week, when nearly 2,000,000 bush. were received from the Kanawha River field. Notwithstanding the shortage, prices remain unchanged. The Monongahela River Consolidated Coal and Coke Company ships all the coal by river from this district. The Pittsburg Coal Company, the railroad coal combination, has shipped many thou-





Treasury deposits with national banks amount- ed to \$107,471,079, showing an increase of \$226,505 for the week.

The statement of the New York banks—in cluding the 63 banks represented in the Clear- ing House—for the week ending June 16th, gives the following totals, comparisons being made with the corresponding weeks in 1899 and 1898:

Table with columns for 1898, 1899, and 1900. Rows include Loans and discounts, Deposits, Circulation, Reserve, Specie, Legal tenders, Total reserve, and Legal requirements.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding date last year:

Table comparing Gold and Silver holdings for 1899 and 1900 across various banks like N.Y. Ass'n, England, France, Germany, Spain, etc.

The returns of the Associated Banks of New York are of date June 16th and the others are of date June 15th, as reported by the Commercial and Financial Chronicle cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin.

Shipments of silver from London to the East for the year up to June 7th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

Table showing Silver exports to India, China, and The Straits for 1899 and 1900, along with a Change column.

Arrivals for the week, this year, were £121,000 in bar silver from New York; £29,000 from Australia, £13,000 from the West Indies and £11,000 from Chile; total, £174,000. Shipments were £17,500 in bar silver to Shanghai.

Indian exchange is steady and the applica- tions for Council bills in London were large. The average price was 16d. per rupee. The Indian Government continues to be a large buyer of silver.

Shipments of specie from San Francisco in May included \$286,574 gold and \$1,154,745 silver. For the five months ending May 31st the ship- ments were as follows:

Table showing Gold and Silver exports from San Francisco to Hong Kong, Lhanghal, Japan, Samoa, Fanning Island, Tahiti, and Central America for 1899 and 1900.

The silver exports this year included \$568,819 in Mexican dollars in May and \$2,336,614 for the five months; against \$18,426 and \$370,011 respect- ively last year. The decrease in gold this year was chiefly in gold coin shipped to New York.

The foreign merchandise trade of the United States, as reported by the Bureau of Statistics of the Treasury Department, showed exports amounting to \$113,503,577 in May and imports \$71,555,687. For the eleven months of the fiscal year from April 1st to May 31st the statement is as follows:

Table showing Exports and Imports for 1899 and 1900, including Excess exports and Deduct excess of imports.

The gold and silver movement in detail will be found in the usual place, at the head of this column.

Other Metals.

Daily Prices of Metals in New York.

Table listing prices for Silver, Copper, and Spelter in June. Columns include June, Sterling Exchange, Fine oz. U.S., London, Pence, etc.

London quotations are per long ton (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The market has been somewhat more active this week and we learn of various trans- actions at last prices. The buying, however, has not been of a very large volume, but it is ex- pected to keep up, as manufacturers do not ap- pear to be fully supplied.

The London market for speculative sorts has been somewhat lower this week. It opened at £72 5s. for spot and £72 for three months, being 2s. 6d. lower than at the close last week. On Tuesday it declined to £71 and advanced on Wednesday to £71 7s. 6d.

Refined and manufactured sorts are quoted: English tough, £75@£76; best selected, £76@ £77; strong sheets, £84; India sheets, £82; yellow metal, 6 1/2d.

The sheet copper and brass manufacturers met in New York June 21st and decided to make no change in current price-lists or discounts. The base price for sheet copper is 20 1/2c. per lb., and for copper bottoms for 14-oz. and heavier, 24 1/2c.

Copper production, as reported by Mr. John Stanton, who acts as statistician for the produc- ing companies, was as follows, for May, and the five months ending May 31st, stated in long tons (2,240 lbs.), of fine copper:

Table comparing May production for 1899, 1900, and Five Months (1899-1900) for U.S. Reporting Mines and U.S. outside sources.

Total U. S. production: 22,082 in 1899, 22,682 in 1900, and 22,682 for five months. Foreign Reporting Mines: 7,911 in 1899, 8,293 in 1900, and 8,293 for five months.

The United States production for the five months shows an increase of 9,405 tons, or 9.2%; of this gain 2,665 tons came from the reporting mines, and 6,740 tons from outside sources. The United States exports have been very large, the increase this year over last being 27,083 tons, or 58.1%. The United States exports were 65.8% of the production.

Tin.—The market has been very quiet. Spot tin continues to command a premium, due to the fact that the supply, while fairly large, is very closely held. Higher prices have been asked in sympathy with the advance abroad. Futures continue to be sold at a very heavy discount. At the close we quote spot at 31c., and later deliveries at 29c.

The London market, which closed last week at £138 5s. for spot and £131 15s. for three months, opened at £138 10s. for spot and £130 12s. 6d. for three months. On Wednesday the market declined to £137 5s. for spot and £133 10s. for three months, but on Thursday spot advanced £2. to £139 10s. and three months' tin 15s. to £129 10s. It closes at £146 for spot, £131 for three months. Our cables report that the spot market appears to be cornered, as the advance of £7 to-day seems to indicate. We call attention to the heavy backwardation of £15.

Lead.—There is no change in the price of this article this week, and we quote New York at 3.70@3.75c., St. Louis at 3.65@3.70c. At these fig- ures considerable business is reported to have taken place.

The market abroad for Spanish lead is 2s. 6d. higher, £17 7s. 6d.; English, £17 10s.

St. Louis Lead Market.—The John Wahl Com- mission Company telegraphs us as follows: Lead is firm but very quiet. Both Missouri and Ar- gentiferous brands are nominally worth 3.70c. East St. Louis.

Spelter.—A fair business has been done at last prices. The production appears to have been

seriously curtailed, and in some quarters it is expected that when the manufacturers, whose supplies are reported to be very low, take hold more largely, a sharp advance in the prices of the metal will be experienced. We quote New York at 4.15c.; St. Louis at 4@4.05c.

In Europe good ordinaries were this week sold lower, the last cable reporting the market at £19 5s., specials at £19 10s.

Nickel.—The price continues firm at 50@60c. per lb., according to size and terms of order.

Platinum.—Consumption is increasing and prices are strong and likely to go higher. For ingot platinum in large quantities \$18.20 per Troy oz. is quoted in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 70 1/2c. per gram.

Quicksilver.—The New York quotation is un- changed at \$51 per flask for large lots; for small orders \$52.50@54 is asked. San Francisco quotations are \$51.50@52 for local deliveries, and \$46.50@47 for export.

The London price continues £9 10s. per flask, with the same figure quoted from second hands.

Quicksilver receipts at San Francisco in May were 1,738 flasks. For the five months ending May 31st the receipts were 9,453 flasks, against 9,881 in 1899 and 9,472 in 1898. The shipments by sea from San Francisco for the five months were: Siberia, 3; China, 1,000; Australia, 100; Central America, 700; Mexico, 2,356; British Col- umbia, 2; Washington, 5; total, 4,166 flasks; which compares with 4,699 last year. The state- ment does not include shipments overland by rail, nor the shipments direct from the mines.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as below:

Table listing prices for Aluminum, Iron, and various alloys like Ferrous Titanium, Ferro-tungsten, Magnesium, etc.

Variations in prices depend chiefly on the size of the order.

LATE NEWS.

The Amalgamated Copper Company has de- clared the regular quarterly dividend of 1 1/2% and an extra dividend of 1/4%, payable July 30th. Books close July 2d and reopen July 31st.

The General Chemical Company has declared the regular quarterly dividend of 1 1/2% on its preferred stock, payable July 2d. Books close June 22d and reopen July 3d.

The Quicksilver Mining Company has declared a dividend of 1/2% on its preferred stock, payable July 16th. Books close June 29th and reopen July 17th.

At the annual meeting in Philadelphia, June 21st, of the shareholders of the Bethlehem Steel Company, the announcement was made that the company proposes to bid for the entire contract for 36,000 tons of armor plate for which bids had been requested by the Government from all steel companies. A member of the board of directors said: "The Bethlehem Company will bid for the entire contract and I think I may safely say the rate specified will be lower than any that we have ever offered the Government before. The reason for this is easily found in the magnitude of the contract to be awarded. Heretofore the Government has seldom made contracts for more than 2,000 tons of steel plate at any one time." The old board of directors was re-elected. President Linderman's report showed \$600,000 paid out in dividends and a surplus of \$3,463,726.

According to the Pittsburg "Commercial Gazette," Noble F. Sanford and Jesse H. Sanford, of Carnegie, have just purchased 1,000 acres of Washington County coal property from James A. Phillips of West Brownville. The tract is to be at once developed for the market, which is to be reached chiefly via the river. The purchase price was \$275 an acre, and the sale has netted for Mr. Phillips on his investment about \$168,000, the latter having purchased the property three years ago at \$107 an acre. No move to develop the tract was made by Mr. Phillips. Lying near Fredericktown, 8 miles above Brownville, the tract has an advantageous frontage on the Monongahela River. It is the last available undeveloped Washington County tract contain- ing such a class of Pittsburg vein coal and with a river frontage, with the exception of 5,000 acres held by J. V. Thompson and others of Uniontown. The latter tract adjoins on the west that sold to the Sanfords, and it is under- stood that negotiations are on which may soon lead to its sale and development. It adjoins property of the Consolidated Coal and Coke Company.







STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Amalgamated, Anaconda, and others with columns for Name of Company, Location, Par Val, and dates from June 15 to June 21.

BOSTON MASS.

Table of stock quotations for Boston, listing companies like Adven's, Actna, and others with columns for Name of Company, Par Val, No. of shares, and dates from June 14 to June 20.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like Am. Sm. & Ref., Am. S. & W. Con., and others with columns for Name of Company, Par Val, and dates from June 15 to June 21.

SALT LAKE CITY, UTAH.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alice, and others with columns for Name of Company, Shares, Par Val, Bid, and Asked prices.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, listing companies like Am. Alkali, Bethlehem Iron, and others with columns for Name of Company, Location, Par Val, and dates from June 15 to June 20.

TORONTO, ONT.

Table of stock quotations for Toronto, listing companies like Ontario, Golden Star, and others with columns for Name of Company, Par Val, and dates from June 9 to June 15.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, listing companies like Belcher, Best & Belcher, and others with columns for Name of Company, Location, Par Val, and dates from June 14 to June 20.

SPOKANE, WASH.

Table of stock quotations for Spokane, listing companies like Butte & Boston, Conjecture, and others with columns for Name of Company, Par Val, and dates from June 15.

CALIFORNIA OIL STOCKS.

Table of California oil stock quotations, listing companies like Anaconda, Blue Goose, and others with columns for Name of Company, No. of shares, Par Val, and dates from June 1 to June 6.

\* California and Producers Oil Exchanges. Total sales, 2,371 shares.

\* Official quotations Boston Stock Exchange. Total sales, 18,306.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing various companies and their stock prices from June 12 to June 18, 1900.

Colorado Springs Mining Stock Exchange. Total sales, 1,694,194 shares.

MONTREAL CANADA.

Table of stock quotations for Montreal, Canada, listing various companies and their stock prices for the week of June 18, 1900.

Montreal Stock Exchange. Total sales, 158,450 shares.

MEXICO.

June 9.

Table of stock quotations for Mexico, listing various companies and their stock prices for June 9, 1900.

DENVER, COLO.

Table of stock quotations for Denver, Colo., listing various companies and their stock prices from June 2 to June 8, 1900.

Official Quotations Denver Stock Exchange. Total sales, 89,000 shares.

PARIS.

June 7.

Table of stock quotations for Paris, listing various companies and their stock prices for June 7, 1900.

LONDON.

June 8.

Table of stock quotations for London, listing various companies and their stock prices for June 8, 1900.

DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest), and Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest). Rows list various mining companies like Etna Con., Alabama Coal & Iron, Alaska-Treadwell, etc.

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. Q., Quicksilver. I., Iron. This table is corrected up to June 2d. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

Table with multiple columns listing various chemicals and minerals such as Abrasives, Borax, Bromine, Calcium, Magnesium, and Salt, along with their respective prices and units.

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

Table listing rare elements including Barium, Beryllium, Boron, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Germanium, Gallium, Indium, Iridium, Lanthanum, Lithium, Magnesium, Molybdenum, Niobium, Osmium, Palladium, Potassium, Radium, Rubidium, Ruthenium, Selenium, Silicon, Sodium, Strontium, Tantalum, Tellurium, Thallium, Thorium, Titanium, Uranium, Vanadium, Wolfram, Yttrium, and Zirconium, with their prices.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to June 9. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.