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Table listing sections such as 'Personal', 'Obituary', 'Societies and Technical Schools', 'Industrial Notes', 'Trade Catalogues', 'Machinery and Supplies', 'Mining News', 'United States', 'Foreign', 'Markets', 'Coal', 'Roofing Slate', 'Chemicals and Minerals', 'Metals', 'Iron', 'Stock Quotations', 'Mining Co.'s', 'Current Prices', 'Mining Stocks', 'Market Reviews', 'Advt. Index', 'Advt. Rates'.

A sample of the "news" which is sometimes spread broadcast about the country is found in a recent press dispatch which announced the discovery of a deposit of quicksilver of extraordinary richness in Grant Park, at Atlanta, Ga.

In Great Britain there has been since the opening of the year active speculation in pig iron, and the sales of warrants have been large. Scotch pig sold February 4th at \$13.34 a ton, Cleveland pig at \$11.56 and Bessemer iron at \$14.40.

We may note that the exports at present are running to products of higher grade than pig iron, such as steel in its various forms from billets up to rails, plates, wire and nails.

The imports of lead into Great Britain in 1898 reached a total of 194,479 long tons, showing the very considerable increase of 27,038 tons, or 16.9 per cent., over the previous year.

The notable point in the returns was the large quantity of lead received from Australasia. In 1898 this reached a total of 42,230 tons, as against 16,394 in 1897, an increase of 25,836 tons, or 157.5 per cent.

The dividends of the Transvaal mining companies for 1898 make a very good showing and correspond better with the gold production of the district than in some previous years.

Table showing dividends for Witwatersrand (£4,833,997 = \$23,525,452) and other districts (151,984 = 739,655).

Table showing total dividends of gold mines (£4,985,981 = \$24,265,107), finance and land cos. (1,568,414 = 7,618,348), and coal mining cos. (67,833 = 330,120).

Total dividends £6,619,228 = \$32,213,575

In the Witwatersrand mines 32 per cent. of all the gold won was paid in dividends, but in the other districts only 15.6 per cent.

The dividends credited to the finance and land companies come, of course, almost entirely from gold mining profits; but so many of them are based upon flotation of new companies and upon dividends received on stocks owned that to include them in the gold mining dividends proper would necessarily involve a good deal of duplication.

The production of pig iron in Germany, including Luxemburg, is reported by the Association of German Iron and Steel Makers in the table below:

Table comparing pig iron production in 1897 and 1898 for Foundry Iron, Forge Irons, Bessemer pig, and Thomas (basic) pig, including tons and percentage changes.

The total increase shown in 1898 over the previous year was 7.5 per cent., a very good proportion of growth. The more important points

in the statement are that foundry iron showed the largest proportion of increase, which is an exception to the course of production for several years past, and that the main increase otherwise was in basic pig. Forge iron and Bessemer pig showed actual decreases. We have again evidence that in Germany, as elsewhere, the tendency to substitute steel for wrought iron has received no check. Moreover, in Germany the use of basic steel, the result of the nature of the local ores, continues to increase steadily, while that of acid steel, both converter and open-hearth, is falling off.

We now have returns from the three great iron making countries, which produce together nearly 80 per cent. of the world's supply of pig iron. Their output in 1898 was 28,304,885 metric tons of iron, and it showed an increase over 1897 of 2,678,589 tons, or 10.8 per cent. The greater part of this gain was in the United States; but business has been active all over the world, and the production for 1898 must have approached a total of 36,000,000 tons—by far the largest ever known.

We regret to see that at the meeting of the National Association of Manufacturers a resolution favoring the passage of the bill now pending in Congress for the adoption of the metric system in public business was laid aside after it had nearly passed, although it is said that a majority of the delegates were in favor of it. This action, it is understood, was taken chiefly through the influence of the Philadelphia clique which has so bitterly opposed the adoption of the metric system. The reasons given by the supporters of the action taken are, of course, the expense and trouble of making changes in measures, gauges, etc. In replying to the argument in favor of the change, based on export trade, they have, however, given away the whole case. One of them says that in shops having export business it is comparatively easy to use metric measures on that part of the trade, while retaining feet, inches, etc., for the home trade. Surely, if it is "comparatively easy" to make the change for export business alone, thereby introducing into the shops an element of confusion, it would be very much easier to make the change complete, adopting the simpler and more rational system entirely.

As we have heretofore said, the opponents of the change very much overrate the difficulties involved, and this opinion is based on an extended shop experience, and a good deal of intercourse with managers, foremen and others in charge of construction of all kinds. We believe that the new measures would be easily and quickly learned, and that the more intelligent workmen would welcome the simpler decimal system, with its logical and quickly understood relation between measures of length, surface, capacity and weight.

We believe that the action of the Manufacturers' Association was a mistake in which the majority of the association will not permanently concur, and we trust that its advocates will not let the matter rest, but will press for a rectification as early as possible.

AN INTERNATIONAL STANDARD FOR SCREW THREADS.

The question of an international standard of metric screw threads was discussed at a Congress which met for the purpose at Zurich last October, and as the result of their labors a certain standard form of thread and a number of standard diameters for bolts were decided on. The form of thread adopted is based on the Sellers thread, so well known in the United States. This, it will be remembered, has the shape of an equilateral triangle truncated one-eighth its height at top and bottom. To insure interchangeability, and to reduce the wear on taps and dies, the Congress recommended that the bottom of the thread should be rounded off by any suitable curve, which should not deepen the cut more than an amount equal to one-sixteenth the pitch beyond the standard Sellers type. The apices of the threads, on the contrary, are to be left flat as in the Sellers system. The following standard, sizes and pitches were decided on:

Diameter. Millimetres.	Pitch. Millimetres.	Diameter. Millimetres.	Pitch. Millimetres.
6 and 7	1.0	24 and 27	3.0
8 " 9	1.25	30 " 30	3.5
10 " 11	1.5	36 " 39	4.0
12	1.75	42 " 45	4.5
14 and 16	2.0	48 " 52	5.0
		56 " 60	5.5
18, 20, and 22	2.5	64 " 68	6.0
		72 " 76	6.5

The pitches chosen are, on the whole, somewhat finer than the Whitworth standards, much used in Great Britain, though in the case of the sizes most used—say between $\frac{3}{4}$ -in. and $1\frac{1}{2}$ -in.—the two systems correspond very closely. This was to be expected, as the standards adopted by Whitworth and Sellers were due to a careful study of the results of many years' experiences. The principal factor in fixing them was the necessity of using threads which could be satisfactorily produced in cast iron. Where wrought iron or steel alone are employed much finer threads can be substituted with advantage; and thus we find in bicycle work $\frac{3}{4}$ -in. bolts with 30 to 26 threads per inch, $\frac{3}{8}$ -in.

bolts with 26 threads, and 9-16-in bolts with 20 threads per inch, sizes which to a certain extent are becoming standard in the industry. It has long been a disputed point as to whether the Sellers or Whitworth thread is the better. Some mechanics think that the sharp corners existing in the former are objectionable, but the form has certainly the advantage of being more easily originated with exactitude. This point had no doubt considerable influence on the decisions of the Zurich Congress, as the threads there chosen will probably be independently produced in many different establishments.

THE HARDNESS OF STEEL RAILS.

An interesting paper on the "Danger of Using Too Hard Steel Rails" was recently read before the British Iron and Steel Institute, and has now been reprinted in pamphlet form. The author of this paper, who has had much experience as consulting engineer and rail inspector for the State railroads and private lines in Sweden, has reopened the long standing controversy between the advocates of different merits of mechanical versus chemical tests and combined mechanical and chemical tests.

Mr. Sandberg uses as his text "some sensational articles published of late years, principally in America, arguing in favor of rails with both 0.50 and 0.60 per cent. carbon and even more," and this tendency he strongly contests, especially for countries having a cold climate, on the following grounds: "(1) That so hard a steel, subject to so many variations in the manufacture, will unavoidably bring in an element of danger to rail fractures in such a way as to make the rail fly in many pieces, and thus cause accidents; (2) that the flattening of rail ends can be partially overcome by giving greater bearing surface between rails and fishplates, as well as by avoiding too heavy wheel loads, and also by adopting heavier rails; (3) as for wear, it is doubtful whether hard rails stand most wear."

Mr. Sandberg also believes that the mechanical test (the "tup" test) by falling weights is the all-important one, and hopes that engineers "will leave out the chemical composition in their specifications altogether and only demand an adequate tup test for safety, as well as a limited deflection to secure the required hardness," and he also advises "leaving out the tensile tests altogether." In support of this latter view, he says that tensile tests "are entirely out of place for rails which are subjected in use to a blow or impact; besides tensile tests are both slow and costly in the preparation of test pieces." And, again, "the rail is subject to a blow in practice and therefore should be tested with a blow."

It was inevitable that the points advanced by the author should give rise to an animated discussion, in which considerable variance of opinion was developed. Want of space prevents entering into so delicate and complicated a problem here, and readers are referred to Mr. Sandberg's interesting paper and the ensuing discussion (printed in the "Journal of the Iron and Steel Institute," as well as in the pamphlet here noticed) by prominent experts. But it may be remarked as to the main question at issue—that is, low carbon, greater safety and less endurance as against high (say 0.50 per cent. or more) carbon, greater risk of fracture, and longer life of rail—most steel metallurgists and railroad engineers are inclined to take a middle ground, adopting as high a degree of hardness as is consistent with safety, which, of course, is the first consideration. This means that no one advocates a steel, however safe from fracture, so soft as to give no economical results (which would be merely a reversion to the old wrought iron rail), and that, on the other hand, all believe that high carbon invariably means brittleness; but just where the danger line lies, or where the best practical or "reasonable" compromise is has not been agreed upon. Steel metallurgy is so progressive that better material may always be hoped for, and in the meanwhile there are the expedients of trimming and renewing by rolling to slightly lighter sections old rails with defective ends. In regard to composition, carbon percentage and effects are, of course, modified one way or another by the other elements (metals and metalloids) in the steel and the amount of work put on it—another very intricate subject. As to tests, it is generally believed, with Mr. Sandberg, that the mechanical test (the tup test for fractures and bending) ranks first, but that chemical analysis is needed always for information, though it may not always be mentioned in specifications.

NEW PUBLICATIONS.

"The Designing of Cone Pulleys." By W. K. Palmer, Lawrence, Kan. Published by the Author. Pamphlet. Pages, 35; with diagrams. Price, 50c.

This essay is described by its author as a non-approximate graphical solution for the problem of proportioning cone pulleys, and he considers that probably no other minor operation of machine designing involves such a complex mathematical analysis as this apparently simple

one of apportioning a pair of cone pulleys. Following the discussion of the problem are given practical rules for application.

"The Railway Map of South Africa." London: "South Africa," 1899. Price in New York, 40c.

The striking feature of this map is the network of railroads already in actual operation in South Africa, now extending far inland, and the numerous lines under construction or projected farther north. For example, a small supplementary map gives the "Cape to Cairo" railroad route, which as drawn runs nearly due north and south; and of which, though a formidable gap still intervenes (indicated by broken lines on the map), about half the distance has been covered, counting from both ends toward Central Africa. Of course many of the existing lines are merely temporary, provisional affairs, and the more ambitious of them leave something to be desired in point of construction and rolling stock; but the showing presented in this map is most instructive, and gives some idea of how rapidly the dark continent is being opened to civilization.

"American Trade Index." Philadelphia: The National Association of Manufacturers, 1899. Cloth, 8vo. Pages, 276. Price, \$1.50.

This is a descriptive and classified membership directory of the association, arranged for the convenience of foreign buyers. It contains the names and addresses of members who make goods suitable for export to other countries, omitting those not interested in foreign trade. The arrangement is as follows: (1) An alphabetical list of members, with a brief enumeration of articles manufactured; (2) names of members grouped according to kinds of goods made; (3) registered telegraphic addresses; (4) advertisements. It is proposed to issue corresponding editions in Spanish, French and German.

The Association of American Manufacturers was formed in 1893 for the advancement of American trade, and its membership now embraces about 1,000 prominent manufacturers in the United States. It neither buys nor sells, but maintains a bureau of information, without charge to buyers, and also an international freight and transportation bureau for attending to the foreign shipments of its members. The association is doing useful work in helping to extend a commercial field to which too little attention has been paid, for while some export branches have been pushed to a certain degree, others have been more or less slighted or wholly neglected.

"Fourth Annual Report of the Boston Transit Commission," for the year ended August 15th, 1898. Boston: Rockwell & Churchill Press. Cloth, 8vo. Pages, 100; with maps, diagrams and photo-engravings.

At the close of the period covered by this report the work of construction of the Boston street railroad subway had been in progress 3 years, 4 months and 18 days, and was prosecuted under the condition that all streets and places under or near which the subway was being built should be open for traffic between 8 a. m. and 6 p. m. The estimated cost of the subway, as made in 1894 before work was begun, was \$5,000,000. The work is now completed, and the commission believes that after settling unpaid bills and disposing of real estate no longer used the cost will be less than \$4,250,000, exclusive of alterations required by an act passed in 1897. This is a very creditable showing for municipal work, and it is the general belief that the work has not only been honestly done, but very well done. The subway greatly relieves the former congestion on principal thoroughfares.

Some of the quantities stated are of interest in connection with the cost of the subway: Excavation, 369,450 cu. yds.; concrete, 75,600 cu. yds.; brick masonry, 11,100 cu. yds.; steel, 3,105 tons; granite, 2,285 cu. yds.; besides piles, ribbed tile, plaster, asphalt, artificial stone, enameled brick and tile, etc., in large quantities. The report of the chief engineer, Mr. Howard A. Carson, gives details of the work performed, specifications, temperature and moisture curves, track plans, details of construction, etc. Besides the subway proper the work embraced other tunnel construction, road bed and track, approaches, stations, entrances and exits.

The commission has also had in hand the construction of the new Charlestown bridge, with stone abutments and piers and 8 spans of steel superstructure, under the immediate charge of Mr. Wm. Jackson, chief engineer of the bridge.

The report is a model of its kind from both the business and the engineering points of view. While the subject matter is well arranged and the text is concise, an index or at least a table of contents would not have been superfluous.

BOOKS RECEIVED.

In sending books for notice, 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.

"Licht, Elektrizität und X-Strahlen." Von Rudolf Mewes. Berlin, Germany; M. Krayn. Pages, 131. Price (in New York), 88c.

"Eighth Biennial Report of the Inspector of Coal Mines of the State of Colorado, 1897-1898." Denver, Colo.; State Printers. Pages, 180.

"Statistical Register of Western Australia for the Year 1897. Part VII. Mineral Statistics and Water Conservation." Perth, W. A.; Government Printer. Pages, 43; with diagrams.

"L'Exploitation des Mines en Roumanie." Par Constantin Alimanes-tiano. Reprinted from "Courrier de Roumanie." Bucarest, Roumanie. Published for the author. Pamphlet. Pages, 34.

"Annual Report of the Section of Mineral Statistics and Mines of the Canadian Geological Survey for the Year 1897." Ottawa, Canada: H. M. Printer. Pages, 232; with map.

"Geological Maps of the Northern Territory of South Australia." Prepared by H. Y. L. Brown and C. Winnecke. Adelaide, South Australia, 1898; Government Printer. In colors. Scale, 20 miles to an inch.

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 only will 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.

Correspondence Schools.

Sir: A rich man when asked the definition of enough replied: "Just a little more." Just at present the man who earns his daily bread by working with his hands has no opportunity to get "enough" unless he is so fortunate as to know just a little more and is able to do just a little more than his fellow workmen.

History states that as populations increase wages decrease, which means if it be hard now to earn a living with one's hands it will be more so later on. I believe every workman should take a course in the United Correspondence Schools, and it is absolutely sure that those who do so will run ahead of those who do not in the race for good places.

Butte, Mont., Feb. 7, 1899.

Alex. Johnstone.

Sir: It occurs to me that the United Correspondence Schools may be a source of much good if they can provide recreation for the miner. Mining towns are so situated that amusements are rare, and as the inhabitants depend upon what turns up for recreation, generally it is mischief of some character not calculated to help them along in life. Consequently, if mine owners would encourage their men to improve their opportunities, and while amusing themselves learn something useful, much wickedness would be prevented. Nearly every one wishes recreation; in fact, must have it. Recreation for one class will not answer for another, but the miner is ready for anything that is a change—and a course of study will answer and be more profitable than other methods of passing away time.

Hazleton, Pa., Feb. 10, 1899.

H. C.

Sir: Kindly allow me to add a few words of my experience to the correspondence instruction discussion now going on in your paper. Originally my idea in enrolling with the United Correspondence Schools was to learn mechanics and mechanical drawing. I had hardly commenced when I had an opportunity to serve in the capacity of head engineer with a mining company. I kept the studies up, working harder than ever, in my new position. The manager one day gave a drawing to the mill foreman, who, unable to understand it, brought it to me. My mechanical knowledge showed me immediately that the plan was wrong, and I corrected it. When the work was completed the manager could not recognize it, and, finding who corrected it, has given me all his designing to do, with extra pay for it. Consultation with him in regard to little improvements in the mill and around the works has given me a insight into that class of work, which I never could have obtained had I not enrolled with the schools.

Mercur, Utah, Jan. 23, 1899.

J. J. B.

Sir: A. W., in your issue of February 4th, makes some remarks upon correspondence schools to which I beg to take exceptions. While the United Correspondence Schools no doubt are of great benefit to the mining machinist and other workers in fitting them to hold more responsible positions and to do better work, yet it is not to be expected that such schools can equip men as thoroughly as our colleges. To carry this thought further, I quote from the catalogue of the United Correspondence Schools: "While our schools are not intended to take the place of, or approach in their scope, the university, college or technical school training, etc., we do justly claim that our province lies in the education of the great masses, etc." I think, therefore, A. W. is assuming too much when he states graduates from the United Correspondence Schools are as well fitted to fill positions at mines as college graduates. The work they set out to do, however, they do well, and I have seen many instances where men secured advancement solely because they had gained technical knowledge in a correspondence school.

Charleston, W. Va., Feb. 6, 1899.

J. J. A.

Gold Dredging.

Sir: While you are warning the general public concerning the inflated values of copper stocks it might be well to say a word to our credulous friends concerning the modern placer system now so much in vogue, and erroneously called "Gold Dredging." I have been an interested reader of your paper for some time and have noticed in its columns the formation of this or that company for the purpose of working these or those placer claims by means of a dredge, and I have seen prospectuses and advertisements of stock for sale which is bound to yield fabulous returns, and have read and laughed and wondered when the speculator would cease to be duped by these glowing visions of wealth. An experienced placer miner, and one who is connected with one of the few successful dredging companies now operating in the United States, made the remark a few days since that "when a man goes into the shoe business he studies the shoe business, and studies it in all its phases. He studies the rise and fall of leather prices and the effect of weather upon trade and enters upon the field of business posted in every branch, ready to devote his time, his money and his business acumen to the simple and withal common trade of buying and selling shoes. But when he enters into placer mining he reads the prospectus of some newly fledged mining company and invests his money in stocks and indulges in dreams until the returns shall come in." This may not be exact, but it is figurative, and may be taken as a type of a class who are investing in such schemes.

"Gold Dredging," or, properly speaking, "Dredging for Gold," is, if carefully entered into, a lucrative and comparatively certain method of mining, but it is shown to the general public from its bright side only, and while it has been discussed and tried for years past, it must

be classed still as an infant industry, and an exceedingly young infant at that. With the extinction of the buffalo we are told the Western plains were strewn with bones of that once plentiful and interesting animal, and if I were to say that the gulches of some of our Western States were strewn with the bones of dredges, relics of money squandered without the necessary accompaniment of brains and experience, I should not be far amiss, and if I said that for every dollar of profit represented by the returns of the profitable undertakings of those who have bought their experience in the expensive school of practical work, there have been burned at least \$10, I should not be far from right.

Having a knowledge of dredging machinery in general, and of the work it is required to perform, the ludicrous side of some of the statements strikes me, perhaps where some one unacquainted with the subject will read and ponder and imagine he is acquiring wisdom. Two manufacturers bidding upon an elevator dredge for the same mining company show drawings of their chains; one is 8 or 10 times as strong as the other, and yet to answer the same purpose, and yet I find examples where the company, against the advice of so-called engineers experts, etc., have purchased the more expensive, heavy chain and have found it entirely too light for service. One designer of gold dredges told me not long ago that he "used a 25 H. P. engine" on his machines, and "it produced all the power that was required," and to my own personal knowledge a boat having three 75 H. P. and one 25 H. P. of the most modern and approved type of electric motors, to perform the same amount of work (this is perhaps incorrect, the latter boat has an actual capacity less than the rated capacity of the former) is frequently stalled. I also know that where this man swears that 25 H. P. do all the work, another machine requires a double (twin) 10 by 14 in. engine at 100 lbs. steam and 1.50 revolutions per minute for its excavating work alone, and a similar engine with two 8x10-in. cylinders, at the same steam pressure and 180 revolutions per minute for its auxiliary machinery, winches, screens, pumps, etc., and finds its power equipment lighter than would be desired. I have read prospectuses that showed the ground to be operated upon worth \$1, and even as high as \$5 per cu. yd.

Will any one tell me as a miner that there is a tract of ground in the world suitable for placer dredging and from 200 to 300 acres in extent that will run all through 50c. per cu. yd., and will be put up a guarantee that if, upon a careful prospect, I find it to be less than that sum, he will pay my expenses for time and trouble, etc., in examining the ground? I have examined properties from Colorado to the coast and from British Columbia through Mexico, and know such ground does not exist. Experienced dredgers do not listen to tales of 50c. and \$1 ground; but when report comes of ground that runs 15c., 20c. or 25c. per yard there are none more ready to spend their time and money to investigate the truth of the report, because experience has taught that this amount is possible and highly remunerative, while tales of greater sums are highly improbable, if not impossible. Not to be too voluminous, the gold dredge scheme is a question that I have studied, and in which I have endeavored to profit by the experience of others, and it is only just that knowledge should be disseminated through your columns.

Chicago, Feb. 14, 1899.

Mercury.

THE NEW YORK MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

Supplementing Circular No. 1, 1899, which contained an outline programme of the coming meeting of the Institute in New York City, the Local Committee wishes to announce that in addition to the excursion to the mines of the New Jersey Zinc Company, they have received numerous invitations, and are making arrangements for excursions to as many of the following works, in and near New York City, as time will permit: Guggenheim Smelting Company, Perth Amboy, N. J.; Balbach Smelting & Refining Company, Newark, N. J.; New Jersey Zinc Company, Newark, N. J.; Ball & Wood Engine Company, Elizabethport, N. J.; Atha & Illingsworth Company, Harrison, N. J.; Crocker-Wheeler Electric Company, Ampere, N. J.; Joseph Dixon Crucible Company, Jersey City, N. J.; New East River Bridge; Brooklyn Bridge; Hecla Iron Works, Brooklyn; Worthington Pumping Engine Company, Brooklyn; Brooklyn Navy Yard, Brooklyn; Nichols Chemical Works, Laurel Hill, L. I.; J. L. Mott Iron Works, New York; Third Avenue Railroad Company, New York; Metropolitan Street Railway Company, New York; Edison Electric Illuminating Company, New York; Tiffany & Co., New York.

A detailed programme, giving itineraries, will be prepared before the opening session of the Institute, and will be handed to those who register at the headquarters, Murray Hill Hotel, and at the hall of the American Society of Mechanical Engineers, 12 West 31st Street, during the sessions held there.

The reception and dance, at Sherry's, on the evening of February 22d, is tendered to the visiting members by those residing in New York City and vicinity. Mr. and Mrs. Abram S. Hewitt will extend an invitation to the members and guests attending the meeting to a reception at their house Thursday afternoon.

The geological section of the New York Academy of Science, through its secretary, George F. Kunz, has extended an invitation to attend a session to be held at the rooms of the American Society of Mechanical Engineers, 12 West 31st Street, on Monday evening, February 20th, when a paper will be read by Prof. G. D. Salisbury, of the University of Chicago, on the "Surface Geology of New York and Vicinity."

The following papers, open to discussion at the New York meeting, have been forwarded to members during this week:

1. "Rich Patch Iron Tract, Va.," by H. M. Chance.
2. "The Discovery of New Gold Districts," by H. M. Chance.
3. "A Description of the Smet-Solvay Plant By-Product Coke Oven at Ensley, Ala.," by W. H. Blauvelt.
4. "Corundum in Ontario," by A. Blue.
5. "Note on the Tuyeres in the Iron Blast Furnace," by J. M. Hartman.
6. "Tuyeres in the Iron Blast Furnace," by B. F. Fackenthal, Jr.

7. "The Possible Origin of the Pneumatic Process of Making Steel," by W. B. Phillips.

8. "Notes on the Operation of a Light Mineral Railroad," by James Douglas.

9. "The Platinum Deposits of the Tura River System, Ural Mountains, Russia," by C. W. Purington.

10. "Note on the Disintegration of an Alloy of Nickel and Aluminum," by Erwin S. Sperry.

11. "The Analysis of Blast Furnace Gas While Blowing-In," by R. H. Sweetser.

12. Kytchym Medal discussion.

Printed proofs of the following papers will be on hand at the meeting:

13. "Results Obtained in the Past Fifteen Years with Stiff and Heavy Rail Sections," by P. H. Dudley.

14. Continued discussion of Kellar's paper on "The Elimination of Impurities from Copper Matte, etc."

15. "A Prospectors' Density-Rule," by James Holms Pollok.

16. "Geologic and Economic Survey of the Clay Deposits of the Lower Hudson River Valley," by Clemens C. Jones.

17. "The Occurrence, Origin and Chemical Composition of Chromite, with Special Reference to the North Carolina Deposits," by Jos. H. Pratt.

18. "The Abrasive Efficiency of Corundum," by Prof. W. H. Emerson.

19. "The Coking in Bee-Hive Ovens of the Coals of the New River District, West Virginia," by Charles Catlett.

20. "The Gold-Bearing Veins of Bag Bay, Near Lake of the Woods," by Peter McKellar.

It is also probable that proof copies of some of the following papers will be on hand; others will be read by the author or the secretary, and the remainder by title, as opportunity permits:

21. Presidential address, by Charles Kirchoff.

22. "Improvements of the Spring Valley Coal Mines, Illinois," by J. A. Ede.

23. "Coal Cutting Machinery," by E. W. Parker.

24. "The Copper Queen Mine," by James Douglas.

25. "Modern Gold Mining in the Darien; Notes on the Re-Opening of the Espiritu Santo Mine, at Cana," by Ernest R. Woakes.

26. "Order of Formation of the Minerals in the Copper Veins at Ducktown," by J. F. Kemp.

27. Discussion of Scott's paper on "The Evolution of Mine-Surveying Instruments."

28. "The Patio Process at Guanajuato, Mexico," by Roberto Fernandez.

29. "The Liberty Bell Mine, Telluride, Colo.," by Arthur Winslow.

30. "The Lay System of Hydraulic Placer Mining," by Otto A. Moses.

31. "The Longest Mine Haulage," by F. Z. Schellenberg.

Mr. Douglas' illustrated paper will be presented at the first session, on Tuesday evening. The papers of Messrs. Parker and Moses will be illustrated with lantern slides; as will be a talk by Prof. Kemp (not for publication as a paper) on the zinc deposits which are to be visited by the Institute.

AMERICAN GAS ENGINES FOR ENGLAND.—A pumping station in the city of London, England, is about to be installed with a very large gas engine plant. This plant will consist of eight double cylinder horizontal gas engines, four of which will be rated at 260 H. P. each and the other four of 210 H. P. each. There are to be a number of small engines as auxiliaries. The Westinghouse Machine Company is completing the building of five of these engines, which will be ready for shipment shortly.

UNITED STATES COAL IN ARGENTINA.—United States Consul Mayer, of Buenos Ayres, writes, on December 27th, 1898: "It affords me great pleasure to report that for the first time American coal has arrived here in sailing vessels. The American schooners 'Mary E. Palmer' and 'William B. Palmer,' Capts. W. H. Haskell and L. McDonald, arrived here from Norfolk, Va., with 4,851 tons of Pocahontas coal. They made the trip in 49 days. Both left Norfolk on the same day and both arrived at this port on the same day. This is a new era for American shipping, and it will not be long until Argentina will receive her entire coal supply from the United States."

AMERICAN STEEL RAILS IN DENMARK.—Vice United States Consul Blom writes from Copenhagen, January 9th, 1899: "From conversations I have had recently with importers of rails I am of the opinion that American manufactured steel rails can compete in quality and price with those hitherto imported into Denmark from Germany and Great Britain. The railroads in Denmark use rails weighing 45 and 75 lbs. per yd., and they use spikes, bolts and fish plates, not chairs. The Danish State railroads are 1,752 kms. and the private railroads 642 kms. in length. Several new roads have been projected, and will be built in the near future. The locomotives are all imported from Germany, but I understand that it is contemplated to send some orders for American locomotives. Manufacturers should correspond with H. C. Peters & Co., Industribyguing, Copenhagen."

ELECTRIC TRAMWAYS IN MOSCOW.—United States Consul Smith, of Moscow, Russia, on January 21st, 1899, writes: "The city council of Moscow has made known that it will publish in Russian and foreign newspapers a statement on February 12th, advising all contractors who are desirous of bidding for the construction of electric railroads in the city to make applications to the city council not later than April 12th. The sum of 750 rubles (\$375) must accompany each application. The council will give all parties presenting applications the terms and conditions of the concessions, with all necessary drawings and statistics as to the working of the tramways in Moscow for the past five years profits of the different localities, list of lines existing, and approximate prices for making out the estimates.

"For foreign bidders there will be issued copies of the contracts printed in foreign languages, which will be sent on demand to all electrical companies. Copies will be sold to all applicants desiring particulars of the contract to be issued. The date of presenting the final tenders will be October 1st, 1899."

ABSTRACTS OF OFFICIAL REPORTS.

Portland Gold Mining Company, Colorado.

The property of this company consists of a number of claims in the Cripple Creek District, covering in all 183 acres. The capital stock is \$3,000,000. The report is for the year ending December 31st, 1898.

During the year the development work done included 326 ft. shaft sinking, 1,115 ft. winzes and raises, 9,950 ft. drifting and cross-cutting. The results of this development were very favorable. Additions to plant included a powder-house, air compressor building and machine shop; additions to ore-house and boiler-house. Four new boilers were erected, five large pumps put in, besides a new steam hoist and some minor additions to the machinery. A drain pipe 2,499 ft. long was laid, which carries the water from the mine to the King Solomon placer claim.

The ore mined during the year reached a total of 27,799 net tons, the product from which was 93,856 oz. gold and 9,258 oz. silver. The total product and expenses for the year were as follows:

	Total.	Per ton.
Ore account.....	\$1,879,682	\$67.62
Interest, etc.....	10,959	0.39
Total receipts.....	\$1,890,641	\$68.01
Mine account.....	297,974	10.72
Fuel.....	47,871	1.72
Explosives.....	35,372	1.27
Mine supplies, etc.....	18,319	0.66
Permanent improvements.....	48,731	1.75
Freight on ore.....	70,036	2.52
Treatment charges.....	279,381	10.05
General and legal expenses.....	84,149	3.03
Total expenses.....	\$881,833	\$31.72
Profit.....	\$1,008,808	\$36.29

The income account for the year was as follows:

Profit, as above.....	\$1,008,808
Dividends.....	\$570,000
New property bought.....	77,453
Surplus for the year.....	\$361,355
Balance from previous year.....	306,957
Surplus, Dec. 31, 1898.....	\$668,312

The dividends for the year were 19 per cent. on the stock. Up to the close of 1898 the company had paid a total of \$1,837,080 in dividends. The average value of the ore showed a considerable improvement over 1897, when it was \$52.70 a ton.

The president's report says: "The management deemed it advisable, after mature deliberation, to purchase the Rex claim of 10 acres, adjoining the company's property on the east, as a safeguard to any arising litigation; also the Morse group of claims, consisting of the Wisconsin, Hawkeye, Buckeye, Colorado City, Last Effort and Hard Scramble claims, containing 38½ acres of ground, which territory is connected with present property by the Lost Anna claim, which gives the company a total of 183 acres in a solid group.

"Litigation that was pending between this company and the Granite Gold Mining Company has been amicably settled; also the Foley case. "The case of the Black Jasper Lode vs. this company is still pending, and in the case of the Uintah Tunnel, a perpetual injunction against the tunnel has been granted this company by the United States Court.

"In the month of March the company became aware of the fact that the Strong Gold Mining Company was encroaching upon the Four Queens claim, a small fractional triangular piece of territory, lying between the Strong claim and the Independence claim, and had extracted considerable ore. This suit will be based upon the apex question, and by order of the District Court of El Paso County, both companies have been working for the past 11 months to prove up their respective rights, and both companies have been restrained from extracting any ore from the territory in dispute."

St. Mary's Canal Mineral Land Company, Michigan.

This company reports for the year ending December 31st, 1898, that the total receipts for land sales, interest and rentals were \$433,284; cash from previous year, \$37,035, making a total of \$470,319. Payments for assessments, taxes, etc., were \$81,664; dividends, \$170,000; making a total of \$251,664, and leaving \$218,655 on hand at the close of the year.

The sales during the year were: 2,040 acres of land for \$442,100; 40 acres of land, the mineral rights to which were reserved, \$1,000; pine timber, \$90,480; total, \$533,580. The real property December 31st, 1898, consisted of 109,312 acres besides the mineral rights in 6,702 additional acres. The average price received for mineral land sold was \$220.75 per acre, and for other land \$20 per acre. The pine sold brought an average price of \$4.50 per 1,000 ft. Payments on account of the above sales were made part in cash and part in notes of the Tamarack Mining Company and in stock of the Old Colony Copper Company and of the Winona Copper Company.

The company has 20,000 shares, and since 1863 the total distribution to each share has included \$111 cash, ¼ share Albany & Boston Mining Company, 1 share Tamarack, 1 share Iroquois, 1¼ shares Baltic and ½ share Winona Copper Company.

There is no change to report with regard to the Pacific Copper Company, which has \$25,489 cash in its treasury and no liabilities.

With regard to the recent sales and flotations by the St. Mary's Company, the report says: "In the statement for 1897 mention was made of the fact that copper-bearing rock had been discovered 6 miles south of Houghton, and that 800 acres of land had been sold to the Baltic Mining Company, organized to purchase and open up the property. This discovery awakened such interest in the whole south range, as the mineral range extending more than 50 miles southwest from Houghton is called, that several new mining enterprises have been started, and some of the mines, which were operated at a profit many years ago, have been or are about to be reopened. Further stimulus has been added to the situation by the expectation that a railroad will be built during the year 1899 from Greenland on the Chicago, Milwaukee

& St. Paul Railroad, northeast to Houghton, and from Houghton to Calumet. The construction of this road has seemed so important to our interests that your directors have agreed, on certain conditions, to donate 2,240 acres of land to assist the undertaking.

"Early in the year an option was sold on 640 acres of land about 20 miles southwest of the Baltic, where some exploratory work was done in 1865, when a fair showing of copper was made, but distance from railroad communication and expensive methods prevented actual mining. The parties who bought the option proceeded immediately to open up the property, and indications were so favorable that the Winona Copper Company was organized to acquire the 640 acres and some 800 acres of adjacent land, and from sales of stock the sum of \$350,000 was provided for its treasury. Part of the payment for the land was made in Winona stock, out of which one-half share was distributed to every share of stock in our company.

"The largest sale of the year was of 380 acres, lying east of the Calumet & Hecla property, to the Old Colony Copper Company, which also purchased 329 acres of contiguous land. Explorations made before the land was bought and since give promise of a profitable mine on a lode which lies farther east than those which have been worked in the past. In this case also we received payment, part in cash and part in stock of the Old Colony Copper Company, from which stock one share was distributed to every share of our stock.

"At the close of the year negotiations were under way for the sale of several tracts of land, and there is every reason to expect that the year 1899 will be a prosperous one. The property is so scattered along the mineral range that it receives benefit whenever a new mine is opened at any point on the range. It may not be known generally to the stockholders that the company's land lies between two points 90 miles apart, and that about three-fourths of it is on the mineral range."

IRON ORE TRADE OF BELGIUM.—In 1898 the exports of iron ore from Belgium, chiefly to France, were 381,827 metric tons, against 410,817 tons in 1897. The imports, largely from Luxemburg and Elsass, were 2,252,530 tons, against 2,544,378 tons in 1897.

THE CHESAPEAKE & OHIO CANAL.—At Annapolis last week, in response to the offer of the State of Maryland recently made, bids for the sale of the Chesapeake & Ohio Canal were opened by Governor Lowndes. There was but one bid, that of C. K. Lord, president of the Consolidation Coal Company, who offered \$300,000. The board decided to reject the bid.

COLOR PHOTOGRAPHY.—It is stated by the London "Engineer" that a photographer at Kieff has obtained a patent from the Russian Government for a new form of color photography. His camera, which is threefold, takes three negatives at once, all alike in outline, but of different values. In the first all shades of blue come out more distinctly; in the second reds, and in the third yellows. From these are printed separately three positives on transparent films, which are then superimposed one on the other. It is claimed that the final result of this combination of the three primitive colors gives a perfect picture in the colors of nature.

SILICIAN BRIMSTONE MOVEMENT.—An advance statement shows that the shipments of brimstone from Sicily in the year 1898 amounted to 443,711 long tons, against 410,538 tons in 1897, and 396,745 tons in 1896. Of these shipments the United States received 139,252 tons, which compares with 118,137 tons in 1897 and 124,923 tons in 1896. In the shipments made to other countries we note a falling off in Great Britain, the imports being 18,480 tons, against 24,520 tons in 1897, and 21,913 tons in 1896; and in Italy, which received 61,306 tons in 1898, against 73,052 tons in 1897, and 54,009 tons in 1896. An increased demand has come from Greece and Turkey, both importing a total of 25,529 tons, as compared with 13,866 tons in 1897, and 18,556 tons in 1896. The imports in France in 1898 amounted to 94,949 tons, against 84,895 tons in 1897, and 76,739 tons in 1896. Germany also shows an increased consumption; in 1898 the imports aggregated 26,525 tons, which compares with 19,721 tons in 1897 and 15,680 tons in 1896. The stocks on hand in Sicily at the end of 1898 amounted to 243,837 tons, as against 240,367 tons in 1898, and 222,999 tons in 1896, while the stocks for a number of years previous were considerably less.

OLD IRON WORKS IN BRAZIL.—A copy of the "Brazilian Bulletin" for December, 1898, contains an account of the Ypanema Iron Works, in the State of San Paulo, Brazil, which date from 1590, in which year two Catalan forges were set up by Affonso Sardinha. "Work was carried on regularly until 1629, when it was abandoned because of the death of the owner. In 1760 a new furnace was built, with leathern bellows and a trip hammer. In a short time this experiment was abandoned and the place became a sugar mill. In 1801 a blast furnace, with hand machinery to furnish the blast, was erected. It is unnecessary to say that this gave no results. In 1811 the government took charge and contracted with certain Swedes to erect stickofen and make bar iron. In 1814 four of these furnaces were in operation, but the ore proved so refractory that the yield was only one ton of iron for 41 of charcoal. The Swedes were dismissed and blast furnaces erected, with proper blast appliances, and the system now employed was gradually developed." Pig iron and bar iron are made at these works, but the quality of both is inferior, owing to the poor quality of the ore. The Brazilian Government offers the works and the mines for sale. The Catalan forges built in Brazil in 1590 may or may not have been built prior to similar works in Mexico, but they were certainly the predecessors of iron works of any kind in the United States or Canada, says the "Bulletin" of the American Iron and Steel Association. The St. Maurice Iron Works, in Canada, the first in that country, date from 1737, and the iron works at Falling Creek, in Virginia, the first in the United States, date from 1619.

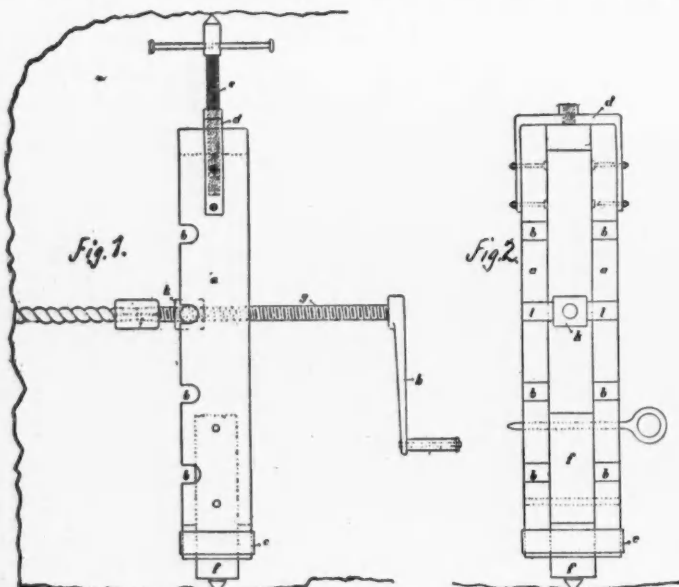
A CONVENIENT DRILL STANDARD.

At the United Wiesche Colliery, near Muhlheim-on-the-Ruhr, Germany, a hand-worked boring machine of the Lisbeth type has been made in the colliery workshops, with modifications which have rendered it very convenient to handle, the work being considerably hastened, so that in 10 minutes a hole 1.5 m. deep is bored with it which formerly occupied 40 minutes in the ordinary manner, according to "Gluckauf."

In the illustration Fig. 1 is a side view and Fig. 2 a front view. As shown by these drawings, the appliance consists of a strong timber frame, a, of a height varying with the thickness of the seam, made with any desired number of grooves, b b (which are easily formed, or rather finished, by burning with a red-hot rod, that serve to receive the trunnions, ll, of the nut, h, through which the boring spindle, y, is screwed. At its lower end the frame is held together by an iron band, c, and at its upper end by the strap, d, secured by bolts and nuts. For fastening the frame between the roof and floor there is at the lower end an adjustable block, f, terminating in an iron point, and at the upper end a screw terminating upwards in a point for adjustment and tightening. Squares are formed on each end of the screw spindle, g, so that, by changing it end for end, and putting the crank handle, h, on to the end opposite that on which it is shown in the figure, the tedious process of screwing back the spindle, which is 1 m. long, is avoided; or at any rate that operation is considerably diminished. Inasmuch as this appliance permits the man working it to assume a very natural attitude, it has found great favor at the above-named colliery, where it is often used for boring in the roof and floor rocks when not too hard.

A GERMAN HAND PUMP.

The small suction and force pump shown by the annexed vertical section, with the dimensions in meters, is, according to "Gluckauf,"



DRILL STANDARD FOR GERMAN COLLIERY.

much used for pumping out the sumps of brake inclines, etc., at several German collieries. It has the advantage, in addition to its being so simple that it can be made in the workshops of any colliery, of being light enough to be easily carried through the workings. Inasmuch as with this little hand-worked pump a strong jet can be thrown, it is very suitable for freeing the face and roof of a heading from coal dust, as also for sprinkling in general, especially when sufficient water for the purpose has collected. By prolonging the outflow pipe with a short hose and nozzle the usefulness of this pump is increased without its handiness being greatly diminished. It will be noticed that the ball valves for both inlet and delivery are such as will not become clogged by extraneous matter.

ELECTRIC POWER AT A FRENCH COLLIERY.—At the January meeting of the Saint-Etienne Section of the Société de l'Industrie Minière, M. Desvignes, Ingénieur-Directeur of the Mine du Cros, gave some particulars of the electric plant put up at that colliery. The triphase current, adopted on account of the slighter giving out of sparks, as regards possible fire-damp disengagements, is generated at the mouth of the Camille shaft, and will drive an underground hauling engine and also a pump, respectively 640 and 900 m. distant, while eventually other plant, especially a large fan, will be driven by the current.

A NEW FUSE FOR BLASTING.—A new tape fuse for use in fiery mines, brought out by the Westfälisch Anhaltische Sprengstoff Aktien Gesellschaft, in Germany, differs considerably in many respects from those now generally used, according to "Gluckauf." While the latter are accompanied by sparks and smoke, the new fuse is specially distinguished by the absence of sparks and the giving out of so little smoke as to be scarcely noticed underground, while the heat when burning is so slight as to permit a miner's hand to be placed on the fuse with impunity. Moreover, the clean-cut end must be ignited by means of German tinder, dried, if necessary, and kindled at the gauze of a safety lamp, and the speed of burning is about double that of ordinary fuse.

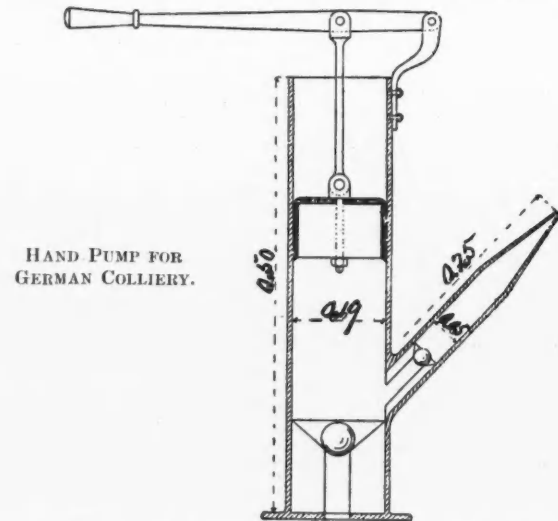
RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

NOTICE TO COAL COMPANY OF POSSIBILITY OF ACCIDENT.—In a suit by a miner against a coal mining company for damages caused by a failure of such company to furnish necessary props, it is proper to admit evidence to show that a short time previous to the injury of the miner a part of the roof of the room fell, and that the side of the room where the fall occurred was then supplied with props, as tending to show notice to the company the necessity of furnishing props to prevent the falling of the roof.—Sugar Creek Coal Mining Company vs. Peterson (75 Appellate Court Reports, 631); Appellate Court of Illinois.

STATUTORY DUTIES NOT TO BE DELEGATED.—A mining statute prescribing the measures that shall be taken by the operators of coal mines to insure ventilation and the safety of the miners changes the general duty imposed by law upon a master to provide a reasonably safe place for the servant to work into a specific duty to do the things required, a failure to perform which is negligence; and such duty cannot be delegated to an employee so as to relieve the operator of the mine from liability for injuries caused to another employee by its omission.—Sommer vs. Carbon Hill Coal Company (89 Federal Reporter, 54); United States Circuit Court of Appeals.

BOUND BY NEGLIGENCE TO INFORM OTHERS.—Where a mining corporation, while doubting the correctness of a Supreme Court decision laying down a rule which limited its right to prospective mining property covered by a lake, entered into a contract with another mining company for drainage of the lake, without informing the latter of its doubt, and allowed the latter to incur over \$100,000 expenses



by reason of the contract, it is thereby prevented from asserting claims to the drained property adverse to those set forth in the contract.—Pittsburg & Lake Angeline Iron Company vs. Lake Superior Iron Company (76 Northwestern Reporter, 396); Supreme Court of Michigan.

WHEN TRIAL FINDINGS WILL NOT BE DISTURBED.—A party and three others were, in 1895, owners in common of a mining claim. After such party had conveyed his interest to another he discovered that the claim was too wide, having a small fraction on one side not located, and brought the fact to the attention of the others, who instructed him to locate it, which he did. Nothing was said about locating it in trust for the company. He divided the boundaries of the fraction by stakes, and he and a laborer did some work upon it, and one of the others also did some work. In 1896 the fraction became valuable. On trial the evidence was conflicting as to who had sunk the discovery shaft. The court, on appeal, held that a finding on trial that the first party located the fraction for himself would not be disturbed.—Reagan vs. McKibben (76 Northwestern Reporter, 943), Supreme Court of South Dakota.

CONSTRUCTION OF CONTRACT—TIME OF DELIVERY.—The suit of Paterson and others against T. Quincy Browne, which has been before the courts for 10 years, has just been decided by the Appellate Division of the New York Supreme Court. The suit was on a sale of nitrate of soda, the main contest being over the claims of the defense that the words in the contract, "bought to be a March and or April, 1889, shipment, from west coast, South America," constituted a condition precedent, and, as that condition was not complied with, the defendants were not required to receive the goods. The plaintiffs contended that the words quoted were mere words of description, and did not require them to cause the goods to be shipped in the months of March or April. Their contention was adopted by the referee, who subsequently directed a judgment to be entered in their favor.

In its decision the Court says: "We are of the opinion that the learned referee erred in his construction of the contract, and that he should have held that the words referred to constituted a condition precedent, and that the failure of the plaintiff's firm to cause the goods to be shipped during the months of March or April, was a violation of the contract, and deprived them of any rights to damages for a refusal of the defendants to perform. These considerations require us to reverse the judgment and to order a new trial before another referee, with costs to the appellants to abide the event of the action."

THE MIIKE COAL-FIELD IN JAPAN.*

The Miike Coal-field, which is one of the largest and most productive in Japan, comprises an area of about 16,000 acres in the provinces of Chikugo and Higo, in the island of Kiushiu. The concession is the property of the great banking house of Mitsui & Company. The description is based on information given by Mr. Dan, the chief mining engineer in charge of operations.

The existence of coal in the Miike District was known many years ago, local tradition putting the date of discovery as early as the year 1468.

Several seams of coal occur in the Miike Coal-field, but the first and the second seams only are capable of being economically worked. The first seam averages 8 ft. in thickness of solid coal, without any interstratified band of shale, as is frequently found in most of the Japan coal seams. This seam is remarkably uniform in quality and thickness, the thickest part often reaching a thickness of over 20 ft. of pure coal. The second seam lies only from 6 to 10 ft. below the first seam, its thickness being about 6 ft., but at present it is being worked only on a limited scale for local consumption.

The production of Miike coal has been rapidly developed within recent years. It was 54,589 tons in 1877, 368,102 tons in 1887, two years before the complete control of the property passed to Mitsui & Co., 702,703 tons in 1895, and that of 1898 was close on 1,000,000 tons. The existing output is from four different pits, but there is at the present time a fifth pit in course of being sunk, whence an output of fully 500,000 tons will be possible on completion. This pit is being supplied with machinery of the most modern type by Messrs. Hathorn, Davey & Co., of Leeds, England.

In the laying out of two of the four collieries now working the proprietors had the advantage of the services of an engineer who had been trained in the United States, and was well acquainted with the latest phases of American mining practice. His experience was required, and was fully put to the test. The latest pit took about ten years to open up, owing to the immense feeders of water that had to be dealt with. Mr.

away in junks of about 30 tons capacity. The most important work that was undertaken was that of sinking a shaft at Nanoura, a spot to the southeast of the Oura Mine. This was commenced in July, 1879, and completed in June, 1882, coal having been struck at a depth of 240 ft. The long delay in completing this shaft was owing to the great influx of water, but the difficulties of pumping it out were eventually overcome, and Nanoura then became, and still is, the principal and most productive mine. Immediately after the Nanoura shaft was completed another shaft in the neighborhood was sunk for ventilation, which was completed in June, 1883, and was immediately fitted up with a fan engine. The next undertaking was that of sinking a shaft at Miyanoura, on the outskirts of Ohumuta, much nearer to the coast than Nanoura and within easy reach of the wet basin. This was commenced in February, 1887, and coal was reached in August of the same year. The machinery for winding, etc., was at once placed in position and mining commenced without delay. As this shaft was close to the existing horse tramway, that means of conveyance was used to transport the coal to the shipping place.

In September, 1883, some of the convicts set fire to one of the coal pillars forming a side of the engine incline, which served also for the in-take airway, hoping in the confusion that they would be able to make their escape, but never supposing that the results would be so terrible as turned out to be the case. The coal, being so bituminous, readily caught fire, 47 human beings and 60 horses lost their lives, the rest only escaping with the greatest difficulty. When further rescue was found to be hopeless the airways were closely sealed up in order to prevent the fire spreading. The water then gradually rose in the mine, and it was closed to work for more than a year. A shaft was subsequently sunk for the purpose of draining the lower part of the Oura Mine thus drowned out. In October, 1896, the ground was opened up for sinking the Katchidachi shaft, which is situated beyond Nanoura towards the limit of the concession, boring operations having shown that the coal seam could be reached at a depth of 420 ft.

The Oura Mine is still worked with the old tramway and tubs, the

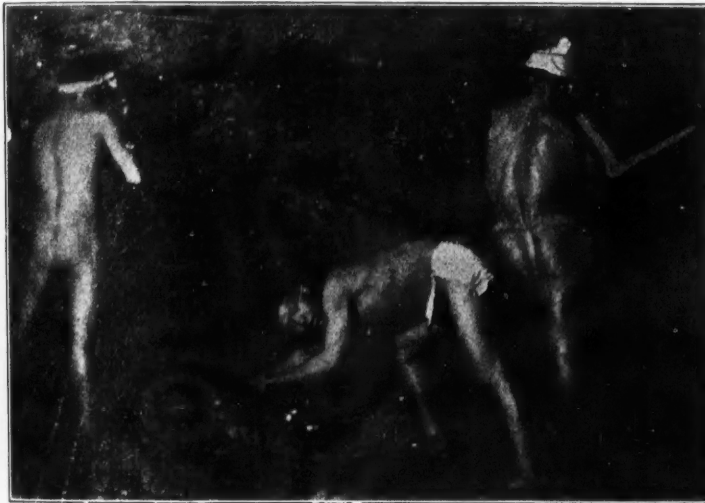


FIG. 1.—CONVICT MINERS AT WORK.



FIG. 2.—GIRLS PICKING SLATE.

MIIKE COLLIERIES, JAPAN.

Dan was fully alive to the Kind-Chaudron system of tubbing and the Poetsch method of freezing the water in colliery sinkings, but unfortunately the conditions were such as did not admit of either of these systems being applied, and there was nothing for it but to provide pumping machinery capable of coping with the rush of water—the strata being mainly of the tertiary formation—at the rate for a time of over 3,000 gallons per minute. The pumps used had 46-in. high-pressure and 73-in. low-pressure cylinders, with 10 ft. stroke. The pumping part had 24-in. cylinder by 10 ft. stroke. The difficulty was largely overcome by sinking another shaft to a greater depth, enabling the water to flow to a lower level. The original shaft's now giving about 100 cu. ft. of water per minute. The depth of the coal is about 420 ft.

It was in 1876 that the Government transferred the management of the Miike Mines to Mitsui & Co., and that firm was also appointed sole agents for the sale of the coal, and under the name of the Mitsui Bussan Kaisha, branch offices were opened at Shanghai and the principal Japanese ports, and subsequently sub-agencies were established at Hong Kong, Singapore and other ports in the East. The Government was fortunately induced to adopt better methods of mining, and from that time onward there was a gradual but improved change in everything connected with the mine. At the time that the Mitsui Bussan Kaisha took charge the output was only about 300 tons a day, the coal being obtained from the Oura Mine, the site of the ancient workings, and carried to the surface in baskets on men's shoulders. The first change was effected by making a new engine incline, with a hauling engine on the surface, and a ventilating shaft and furnace. The east coast of Shima-bara Gulf is very shallow, and at low tide vessels of even the lightest draft are unable to approach near to the shore. Consequently it was necessary to build a tidal basin and a lock gate, and a basin covering an area of two acres was then sufficient for the purpose. This wet basin was connected with the Oura Mine by a tramway, along which the tubs containing the coal were hauled by ponies to the wet basin, and shipped

latter being made of wood, as it was found more economical to have them so constructed than made of iron. But the shaft at Katchidachi and the Nanoura and Miyanoura mines are connected with the dock by a railroad of 3 ft. 6 in. gauge. The road-bed gradually rises after passing Miyanoura, so that it passes over the Kiushiu Railway, running through Ohumuta, and continues on a high level to the pier. The line is a single-track, and the distance from Katchidachi to the dock is about 3½ miles.

The 8-ft. seam is remarkably uniform in quality and thickness over a very large area, as proved by explorations and repeated borings, and the thickest parts often rise to 20 ft. of pure coal, but at the lower levels of a slightly better quality. Up to the present the mines in this seam are free from explosive gases, so that naked lights are invariably used with impunity. The second seam lies only from 6 to 10 ft. near the outcrops, but is more irregular and uncertain in the deeper portions. The coal from the second seam is free burning and non-caking, but its quality is inferior to the coal from the 8-ft. seam, and is now worked only on a limited scale for local consumption.

One great disadvantage peculiar to the Miike Coal-field is the entire absence of shale in the strata overlying the coal. The strata are composed of different kinds of sandstone, more or less coarse, porous and fissured, which allow an easy passage of water from the surface to the coal seam, thus rendering the process of mining expensive and dangerous from flooding. But on the other hand the dip is comparatively gentle (about 5°), the roof is firm and strong and no faults worth consideration are found.

In the Nanoura Mine there is remarkably little discomfort underground, as the mine is comparatively cool, the rooms averaging 15 ft. in width and 8 ft. or more in height, while frequently the height to the roof increases to 12, 15 or 20 ft. The coal is mined by pillar-and-stall system, the pillars being 66 ft. square. As far as practicable, the levels are driven in the direction of the strike from either side of the engine incline at convenient distances from 500 to 700 ft. apart. The engine incline is parallel to the dip, and is 3,000 ft. in length. The underground

*Abstract of article in the London "Iron and Coal Trades Review," January 6th, 1899.

workings cover an area of 437 acres, but two-thirds of the coal is left as pillars. The coal mined is loaded into tubs, which are drawn along the tramway by ponies to the engine incline, and thence hauled up to the foot of the shaft by the engine, which is placed at the top of the incline, about 90 ft. from the bottom of the winding pit. The ventilation is effective, the fan discharging about 100,000 cu. ft. of air per minute. The water from the mines in work is pumped up to the surface from the winding and ventilating pit of Nanoura, and to accomplish this task nearly all the 21 large boilers on the surface of this mine are used. Steam is taken down the ventilating shaft and conveyed to the various pump stations, the furthest one being over 3,000 ft. from the pit bottom. Twenty Tangye pumps are at work, six of the largest in use having steam cylinders 11 in. diameter and 48-in. stroke, and the quantity of water discharged is about 3,000 gallons per minute.

The company owns several tank locomotives for work upon the mine railway, two of them being American, weighing about 11 tons each in working order, and one being English manufacture, weighing about 22 tons. The company also owns 100 cars, besides trucks, for carrying materials, the former being made on the plan of the 5-ton cars used in the anthracite region of Pennsylvania, but carrying only 4 tons, on account of the narrow gauge of the line. The cars and trucks are all made on the premises. The company has a foundry and machine shop, where important work is done, such as casting pumps, making ordinary mining machinery, etc., and there are branch machine shops at the mines, where repairs are executed.

Since 1877 boring for new deposits, etc., has been extensively carried on, for which the old-fashioned jumper drills and iron rods were formerly used, the greatest depth obtained being 600 ft.; but the increased depth that would be required for future prospecting, as well as the desirability of a large diameter of bore, called for some better means, so it was determined to try the American system of rope boring. The first attempt was made in September, 1891, and the complete rig having been erected, boring was connected with an 8-in. bit and progressed until a depth of 500 ft. was reached, when a 5-in. bit was substituted, and the boring was continued with great success, until the coal was struck at a depth of 800 ft. in 250 days' time, the cost, including coal used for the engine, being about \$1.50 per foot. The success which attended this boring led Mr. Dan to try if the rope boring could not be made available for pumping purposes as well as for prospecting, so he erected a framework near the limit of the Nanoura working, where the dip of the coal seam lies at great depth, and bored a well with a bit of 18 in., weighing 2,000 lbs.

The bulk of the mining is carried on by convicts. Some years ago the demand for this labor had so increased that the Government built a large convict prison in the neighborhood of the Nanoura Mine, accommodating 1,600 prisoners, and when the Miike Mine was sold to Mitsui & Company it was stipulated that convict labor should be employed, as hitherto, the Government receiving a fixed price for the work done. This has gone on without interruption ever since, and at the present time 1,500 men of the Miike prison, who are medically passed as fit to work in the mine, take their turn in day and night shifts. All the convicts are undergoing long sentences, none being in for less than 12 years and nearly 400 of them for life.

The coal, after being thoroughly sorted and cleaned, is automatically dumped into cars of about 4 tons capacity, and after being weighed is hauled by locomotives to the loading dock and there dumped into barges from adjustable telescopic chutes fixed on the wooden pier. A special arrangement for checking the velocity of falling coal is attached to the end of the chutes to prevent breakage. Upward of 200 schooner-rigged barges, carrying from 100 to 160 tons each, are engaged in transporting coal to the shipping ports of Kuchinotsu, Mitsumi and Nagasaki. Many junks also call at Ohmuta to purchase and load coal for consumption at salt works and elsewhere. Four steam tugs are employed in towing barges and vessels loading at the ports of shipment. The transportation to the dock is carried on by four locomotives and 180 cars. By the completion of a junction of the mine railway with the Klushiu Railroad coal can now be carried directly from the mine to Moji harbor and elsewhere. The company owns two extensive tidal basins, connected by a narrow passage. Each basin is furnished with a lock-gate, 36 ft. wide, having a depth of 10 ft. of water. This arrangement enables the barges to enter at one gate and pass out at the other. To provide access to the docks a channel is dredged out into the bay for a distance of a mile and a half.

THE COMMERCIAL MANUFACTURE OF IRON SILICIDES.*

By G. de Chalmot.

Iron silicides containing about 11 to 13 per cent. silicon have for some years been made in blast furnaces, and have been successfully introduced in the manufacture of iron and steel. It has been found impracticable to much increase the amount of silicon by the blast furnace process. This can, however, be successfully done by changing the process and making use of the great heat of the electric furnace. I have made in the electric furnace silicon iron alloys containing from 12 to 46 per cent. silicon. In alloys up to 46.5 per cent. silicon, and most probably in those up to 50 per cent. silicon, the iron and the silicon are chemically combined; there is no free silicon and no free iron present. If more than 50 per cent. silicon is forced into the iron the excess crystallizes out in small black crystals. This article deals only with silicides containing 25 to 50 per cent. of silicon.

Silicides of from 25 to 50 per cent. silicon seem to consist of a mixture of two distinct compounds between iron and silicon—compound A, which contains 25 per cent., and compound B, which contains 50 per cent. silicon. These compounds are represented by the chemical formulas Fe_2Si_3 and $FeSi_2$. Both these compounds were obtained pure enough for analysis. When iron silicides with about 25 to 28 per cent. of silicon are allowed to cool slowly from the liquid condition, compound A will crystallize out in very well-developed crystals, some of

which will be as large as one-half inch to the side. These crystals have never been determined crystallographically. They have, among others, well-developed tetrahedral faces. These crystals are best obtained from an alloy containing from 1 to 2 per cent. silicon above 25 per cent. It is probable that some iron silicon compound containing less than 25 per cent. silicon hinders the crystallization of the compound Fe_2Si_3 .

Iron silicides are invariably crystalline, and are white or gray in color. Silicide with from 25 to 30 per cent. silicon takes a fine polish, when it more or less resembles silver, although somewhat darker. The higher grade silicides are the darker in color. The melting point rises with the percentage of silicon. Silicide of 26 per cent. silicon can be melted in the crucible of a brass furnace, but takes a higher temperature than brass. Silicide of 32 per cent. silicon cannot be melted that way. This latter can be melted in a crucible by using a good blast. The silicides containing more silicon could be successfully melted only in an electric furnace. These silicides should not be molten in a blast cupola. The silicon burns as easy or easier than the coke, and the molten metal will contain considerably less silicon than the original. A lot sent to a foundry and treated in a cupola lost 5 per cent. silicon out of 27 per cent. If such partly oxidized metal is cast it will often form a coating of a gelatinous silica in the mold. This latter is weakly transparent and elastic to quite a degree.

Lower grade silicides cast very well with sharp outlines and corners. When the amount of silicon is increased the castings show a tendency to crack when cooling. The silicides of 34 to 40 per cent. silicon usually form blow-holes, besides cracking, when the castings cool. When the higher grade silicides are cooled very slowly the tendency to crack is lessened. All these silicides are but slightly magnetic, and those with over 30 per cent. silicon are quite non-magnetic, which well shows that there is no free iron in the alloy. Their specific gravity falls with the percentage of silicon.

These alloys conduct electricity easily, and are very hard. They are brittle, the more so when the percentage of silicon increases. They are unalterable in air or in water. Acids attack them very little, especially if they are not pulverized. Hydrofluoric acid forms an exception, for it easily dissolves all these alloys. Acid oxidizing agents attack these silicides less the more silicon there is present.

The raw materials which are commonly used in the works of the Willson Aluminum Company are a good iron ore, river sand and any kind of coke. The river sand contains some manganese and titanium. The quality of the iron ore can be materially reduced so long as the chief impurity is silica. In fact, for many reasons, such an ore is preferable. After trying many fluxes they were entirely abandoned, for they always reduce the output.

The materials are finely ground, with the exception of the silica, which should be of the size of coarse sand; on account of its volatilizing easily, and, being very light, it is readily carried away by the draft of the furnace. At the temperature that exists in the electric furnace the carbon monoxide does not act as a reducing agent, and it is the solid coke particles that do the reducing. For this reason the mixing must be thorough and the ingredients must be finely ground.

We use at Holcomb Rock Works a continuous furnace of my own design. It is fed at the top and tapped at the bottom. These furnaces are run one week, or, in fact, any length of time, and they can be cleaned and made ready for use again in a few hours. We make, so far, iron silicide in furnaces of only about 150 electrical horse-power, but by enlarging the furnace we can easily use 1,000 horse-power or more in one furnace, which will materially reduce the cost. Our furnaces give little dust, and that only when they are opened. This is a great advantage, for the fine silica dust is very objectionable. I have seen this dust settle 2 in. deep all over the room from an open furnace.

During the operation the alloy runs to the bottom of the furnace, where it collects in a pool, and is tapped at regular intervals. There is only little slag, if the materials are mixed in proper proportions. The metal which runs out is very free of enclosed slag. It comes out white and the tapping can be seen for quite a distance if windows or doors of the factory are left open. An excess of silica must always be taken, to make up for that which volatilizes. This excess must be materially increased when the higher grade alloys are to be prepared. Since this volatilization of silica requires power, it follows that it takes more power in proportion to make a high grade than to make a low grade silicide. We use about twice as much power to make an alloy of 35 per cent. as to make one of 25 to 27 per cent. The silicon in the former alloy is correspondingly more expensive.

On account of their great purity and small bulk these silicides are superior to those made in the blast furnace, but they can only be used instead where the character of the work admits of paying a larger price for the unit of silicon.

These alloys are very resistant against acid oxidizing agents and conduct electricity well. They are a cheap material for anodes for electrolysis in aqueous baths. The lower grades make nice, correct castings. These low grade alloys can be used for making luxury articles, statuettes, etc. The metal, when polished, has a beautiful and lasting luster. The higher grades and also the lower grades may perhaps be used instead of aluminum in the heating process of Goldschmidt. This process consists of mixing aluminum foil with some substance capable of yielding oxygen, and igniting the mixture at one point. The reaction between the aluminum and the oxygen, if started at one point, gradually proceeds through the whole mass, and a heat is produced which, in intensity, is second only to that of the electric arc. The silicon of the iron silicide may replace the aluminum, and can be made for a lower figure. These silicides are valuable abrasives, being very hard and still easily crushed.

AMERICAN LOCOMOTIVES FOR INDIA.—In the latest number received, "Indian Engineering" says: "There is a probability of a new departure being taken by the Government of India in the matter of providing railway locomotives. An order for several engines is likely to be placed with American firms, as the makers in England are so busy that they cannot undertake to complete Indian orders within a reasonable time. The Central Bengal Railway Company has already tried American locomotives, which have given every satisfaction."

*Abstract of paper in the "American Journal of Chemistry."

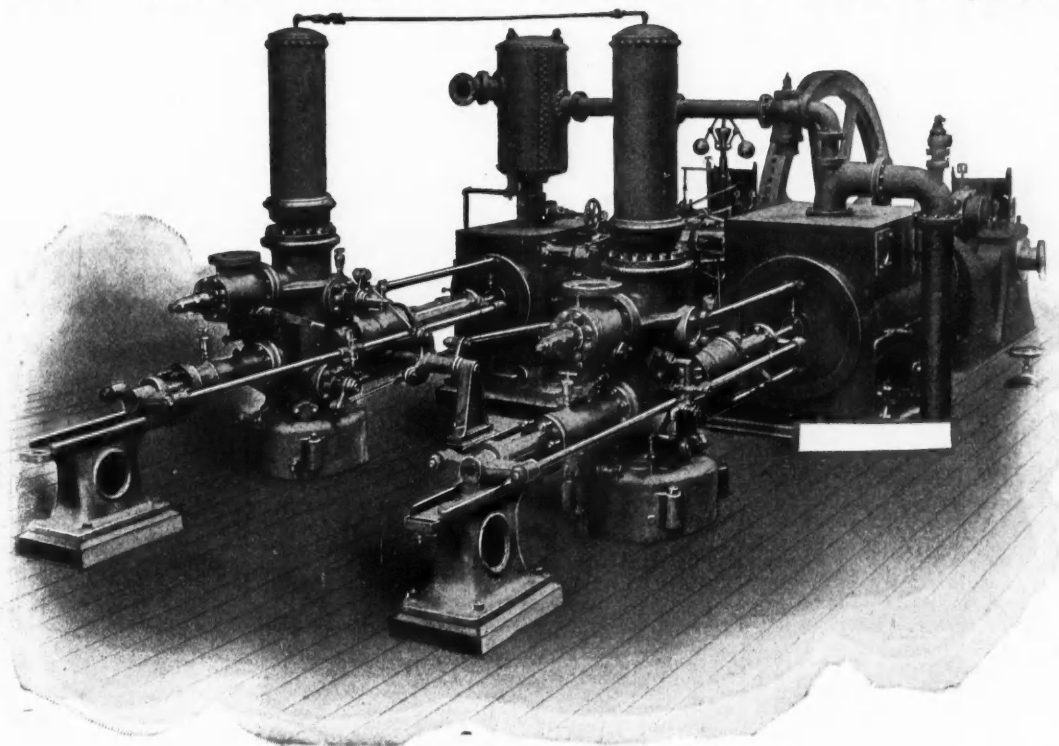
RIEDLER PUMPING ENGINE FOR HEAVY LIFTS.

The accompanying illustration shows a pumping engine which is interesting on account of the heavy lift and high duty. The pump was built by Fraser & Chalmers, Chicago, for the Negociacion de Santa Ana in Mexico, and its regular work is 600 gals. a minute at 70 revolutions, against a single lift of 1,654 ft. The illustration is from a photograph showing the engine and pump set up and ready for work.

The engines are cross compound condensing, the air pump being driven from end of engine shaft. The main pumps are differential of a very compact design outside connected as to plungers. The suction chambers serve as bases for the pumps. There is but one suction valve and one discharge valve for each pump. A funnel leading to the suction valve of each chamber leaves about it a large annular space forming an ample and efficient air chamber.

The discharge valve is directly above the suction valve, both being mechanically moved on the Riedler system. The main plunger moves in the pump barrel between these valves, and has only outside connection with the smaller plunger. These plungers have semi-spherical ends and move in different barrels connected only through the discharge valve. The differential operation is as follows: The main plunger having drawn in a volume of water equal to its displacement, on its return stroke passes all this volume of water through the discharge valve but lifts only half of it against the head, the other half being passed over to the smaller plunger which on its reverse stroke lifts the other half of the water against the head. The pump therefore has the smoother and more continuous flow due a double-acting discharge with the simplicity of construction due a single-acting suction.

The significant thing in the appearance of the pump is the small-



RIEDLER PUMP FOR NEGOCIACION DE SANTA ANA, MEXICO.

ness of the pump body considering the capacity of the pump. An ordinary pump of the same capacity would have a big body full of little valves, or a row of valve pots. The Riedler system with its positive water valves, lifting just as high as desired and closing just at the right moment gets rid of all this bulk of complexity and permits the use of single valves, the action of which is much more certain and reliable than that of the ordinary automatic or water moved valves.

The Riedler valves are usually lifted and closed by a system of forks, levers and rockers which makes the actuating movement for the pump valves somewhat similar to that of the steam valves in the high duty Corliss engine, by which the pumps are driven. Other engineering features are plainly shown in the illustration, and all in all this may be presented as a good example of high-grade American engineering. A comparative test of this particular engine is not available, but in several cases where similar Riedler pumps have displaced ordinary duplex compound pumps the saving in fuel has been actually 60 per cent.

LIMESTONE USED FOR FLUX.

According to the statistics collected by the American Iron and Steel Association the limestone consumed for fluxing purposes by the blast furnaces in the United State in 1897 in the production of 9,652,680 gross tons of pig iron amounted to 4,247,688 gross tons, of which 3,680,666 tons were consumed by the bituminous coal and coke furnaces in the production of 8,464,692 tons of pig iron, 524,271 tons by the anthracite and mixed anthracite and coke furnaces in the production of 932,777 tons, and 42,751 tons by the charcoal furnaces in the production of 255,211 tons. The average consumption of limestone for the whole country per ton of pig iron produced in 1897 was a little over 0.44 ton.

The total quantity of limestone similarly consumed in 1898 in the production of 11,773,934 tons of pig iron was 5,275,819 tons, of which

725,729 tons were consumed in producing 1,203,273 tons of pig iron made with anthracite and mixed anthracite coal and coke; 4,502,209 tons were consumed in producing 10,273,911 tons of pig iron made with bituminous coal and coke, and 47,881 tons were consumed in producing 296,750 tons of pig iron made with charcoal. The average consumption of limestone for the whole country per ton of pig iron made in 1898 was almost the same as in 1897, the figures being .448 ton, or about 0.008 ton more than in 1897.

THE CASSIAR DISTRICT, BRITISH COLUMBIA.

Written for the Engineering and Mining Journal.*

The Cassiar District became somewhat prominent during the summer of 1898 through the efforts of the Cassiar Central Railway Company, which has been systematically exploring a large area in which it has the right to select mineral blocks in consideration of building a railway from Glenora to Dease Lake. The area known geographically as the Cassiar District is a large unexplored region east of the coast strip of Alaska and in the northwest corner of British Columbia adjoining the Northwest Territory. Particular interest attaches to this district on account of its nearness and similarity in many respects to the Klondike and also from the fact that several of the practicable routes to Dawson City lead through some part of it. During the past season thousands of persons have entered the Northwest Territory by way of Dyea, Skaguay and Wrangel and have attempted to cross through most of the known mountain passes leading from the coast. A large number came to Glenora, at the head of steamer navigation on the Stikine River, which flows to tidewater at Wrangel. Owing to the difficulty

of reaching Teslin Lake over the unbroken trail, many changed their plans and followed the old Government trail, built during the time of the Cassiar excitement, to Dease Lake. In this journey they passed nearly diagonally across the Cassiar Central Railway Company's concession. Most of the parties, however, rarely left the waterways and passed on to the Liard River and other districts northeast, thus leaving a territory that offers quite as many inducements to the prospector as the more distant points to which they were bound.

The natural route to the Cassiar District is by way of Wrangel. The first part of the trip is up the Stikine River about 150 miles to Glenora. The river is large, generally swift, and navigable for steamers 150 feet in length, with a carrying capacity of 75 to 100 tons of freight. Owing to frequent bars and variable stages of water, stern-wheel steamers are the only ones used. The river passes through the coast mountains, which continue inland some 50 or 60 miles, the steep banks and canyons exposing the granites and schists of the Coast Range. The schists are prominent on the islands of the coast and again, after passing the granite, continue in more or less regular series some hundreds of miles as far as traced eastward. Excepting a general determination of the relative ages of the granites and schists and a statement of some of the members of the schistose series, the geology of the Stikine River is very little known. Since the work of Dr. Dawson, who ascended the river and went by Dease Lake and River to the Pelly about ten years ago, little systematic geological work has been done in the Cassiar District. Although Dr. Dawson's explorations were necessarily conducted hastily on account of the great distance he traversed, his geographical and geological outlines are considered authoritative and have been the basis of subsequent work in more restricted areas. In the accompanying map showing the boundaries of the railway concession,

*From report on Cassiar Central Railway Mining Land Grant, by Edward D. Self, Consulting Engineer.

which embraces an area of about 10,000,000 acres, the position of the Stickine River, Dease Lake and River are from Dr. Dawson's report.

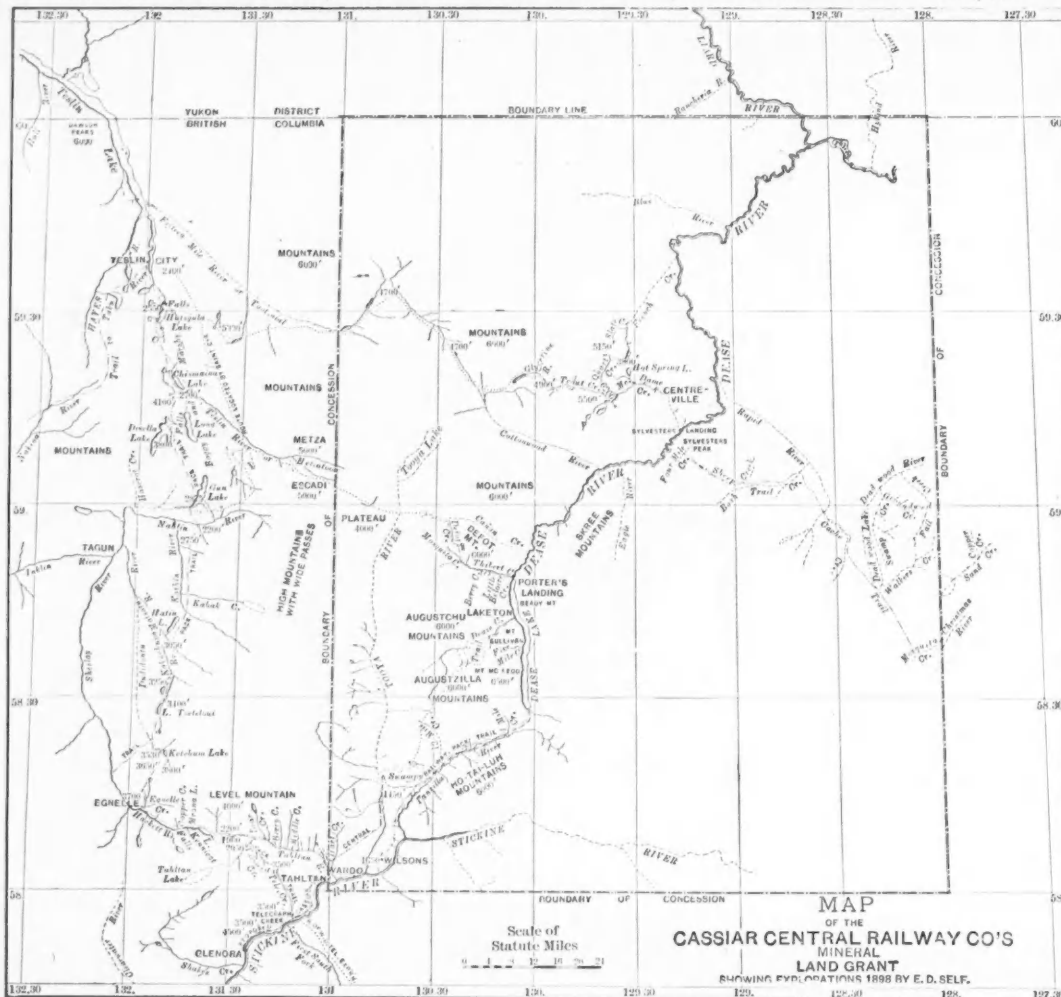
After passing the Coast Range, west of which the climate is damp and subject to heavy rain and snow falls, the relatively dry winter makes the extreme cold less difficult to bear. In Glenora, the proposed terminus of the railway, although at very nearly 58° north, the winter is not severe enough to prevent underground work being continued throughout the year. This also applies to Dease Lake District and other parts of the country where the air is equally dry. During the winter, when the Stickine River has frozen, the only access to the country is by traveling over the ice, a journey that is difficult and full of hardships for those who are not accustomed to winter traveling in the far north. In the winter of 1897 and 1898 large numbers attempted this trip, and considerable suffering resulted. Many parties were unable to get more than a short distance up the river and were forced to camp until spring and afterward wait until the first trips were made by the steamers from Wrangel before being able to get their supplies to Glenora. Unless parties take with them little freight and are properly equipped with dogs and sleds the winter trip should be avoided by all but experienced men who know the difficulties of the undertaking.

At Glenora the Hudson Bay Company has built a large store and warehouse, and there is also a custom house and postoffice maintained

Dease Lakes there was not discovered evidence of any great faulting, but insufficient observations were made to determine the sequences of the schists and slates found in the different localities along the probable strike. Several areas of recent sedimentary rocks were noted near the head of Cottonwood Creek which may correspond to the coal measures in the Tooya Valley not far distant from the Stickine. No coal, however, was found at this point.

The second map given herewith is a sample of the series of rock maps made by Mr. Self in passing through the country. No good or even approximately accurate maps of the Cassiar Region had ever been made before this exploration.

The country near Telegraph Creek and Glenora has been subject to numerous basaltic flows and the Stickine River here passes through canyons showing at least four such independent superimposed lava beds. At the junction of the Tahltan and the Stickine Rivers these basalt beds are very prominent. The Stickine has here cut for itself a channel crossing below its old bed, which, though filled by lava, is clearly exposed on the face of a cliff. On the south side of the Stickine River there are many lava terraces and the beds are no doubt of great size and depth. Owing to the difficulty of crossing the canyons, which are almost impassable, this side of the river has hardly been explored and is little known. North of the Stickine and following the Tooya River Valley are numerous basaltic outcrops that are, however, cut



by the Canadian Government. There is a good trail from Glenora to Dease Lake passing through Telegraph Creek, from which point there is also a trail to Teslin Lake, distant about 162 miles. The latter trail was so badly cut up during the early part of the summer by the large number of mules and pack horses on their way to Teslin as to be almost impassable. This fact and the exorbitant rates charged by the pack trains induced many to follow the trail to Dease Lake, and, changing their plans, continue to the north and east from that point.

During the summer of 1898 the Cassiar Central Railway Company had a force of prospectors in the country west of Dease Lake and established headquarters at Glenora and an assay office at Laketon. The engineer and manager of the company is Mr. Edward D. Self, formerly a consulting mining engineer in Johannesburg, in the Transvaal. A general outline of the geology of a very large area was determined by Mr. Self in an extended trip from McDame's Creek to Teslin Lake and then from Teslin Lake to Dease Lake by way of the Defot Mountain. In general the country was found to be composed of a series of schistose rocks, dipping nearly vertically. Several prominent limestone exposures were found lying parallel with the strike of the country and also some large, well defined diabase dikes or sills that apparently extend continuously for many miles along the strike. North of Dease Lake, near Cottonwood Creek, is a granite exposure of considerable magnitude, of later origin than the schists. The general strike of the granite, which appears in a prominent range of rugged mountain peaks 6,000 to 7,000 feet high, conforms approximately to the strike of the country rock, and although the granite area has not been traced continuously to the northwest, it may be closely related to the granites reported in the Klondike areas farther northwest. Between Teslin and

away in many places over large areas. It seems probable that for a distance of 75 or more miles north of Telegraph Creek there were lava beds more or less corresponding to those just described. West of Defot Mountain and Canyon Creek there are also large exposures of columnar basalt that seem to mark the eastern boundary of the flow. West of the Tooya Valley is a plateau nearly 5,000 feet high separating the Stickine River and the Teslin Lake watersheds. Several high mountains on this plateau have basaltic tops nearly 1,000 feet in thickness resting on the schists. Basalt has also been reported east of the foot of Dease Lake.

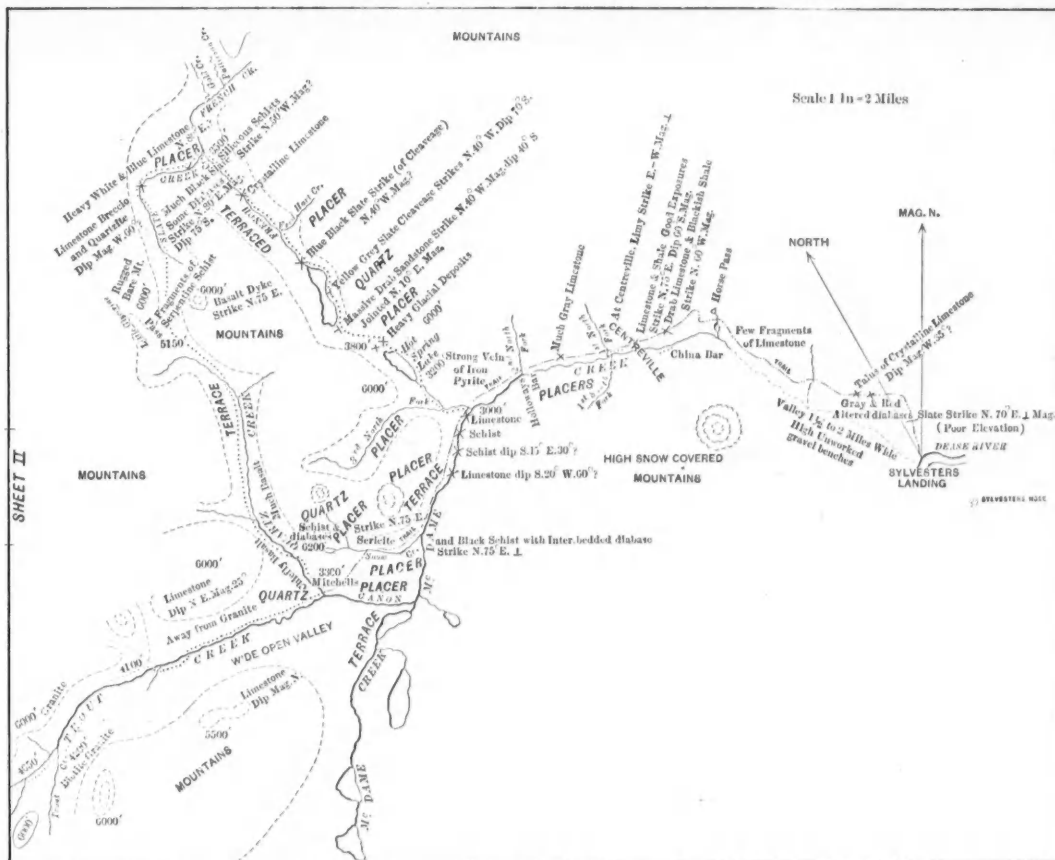
The marked topographical features that would be expected from the geological conditions just mentioned are largely concealed by a glacial deposit of great thickness that has changed the pre-glacial water-courses and formed moraines, terraces, eskers and other glacial phenomena that are striking features of the topography. The great extent and depth of the glacial deposits have an important bearing on the economical development of mining and makes quartz prospecting in the valleys frequently difficult, if not impossible. Terraces varying in height from a few feet to 60 or 70 are prominent in all the valleys about Dease Lake, on the Stickine River and at all points where glacial streams or lakes allowed the deposition of glacial material under conditions favorable to the formation of horizontal beds of gravel. In many instances the beds first formed have been cut through and redistributed by later streams, as in part of McDame's Creek, and the probable source of the placer gold in the creeks has been thus rendered more obscure. Among the interesting changes produced by the deposit of gravel may be mentioned the reversal of the drainage of Dease Lake Valley and the formation of the lake itself. There is only a slight ele-

vation of gravel between the head of the lake and the Tanzilla River, a branch of the Stickine, and the foot of the lake is closed by gravel deposited in the valley above the present mouth of Thibert Creek. A similar operation can also be noted at Laketon, 18 miles from the head of the lake, where the delta formed at the mouth of Dease Creek nearly divides the lake. Where the valleys are wider the terracing, as might be expected, is less prominent or entirely absent. Portions of the Tooya and Cottonwood valleys are filled with gravel beds, but the chief deposits noted are about the head of Teslin Lake, where the valley is over 20 miles wide. Between the Tootzelai and Teslin Rivers are well formed eskers and potholes, and many square miles of country are covered by glacial deposits, the irregular surface of which has produced innumerable lakes, many of considerable size. From one of the mountains east of Teslin Lake 30 such lakes can be seen in the valley. These gravel deposits form a part of the deposit made by the great Continental Glacier, whose center was in the northwestern part of British Columbia. There are now few glaciers remaining in this part of the country, and those observed, excepting the great glaciers of the Stickine and the larger coast glaciers, were of small size and unimportant. The thickness of the ice originally covering the interior of the Cassiar District was probably not less than 1,500 feet.

The bearing of the above facts on the distribution of the gold for which the country was well known in the time of the first Cassiar excitement, are chiefly economic ones, for aside from the enormous dilution of the true stream gravels by the subsequent deposition of

pidity with which particles of rusty gold of small size settle in battery launders, where the conditions are often favorable to their transportation, can easily believe that nuggets 1/2 in. or more in diameter can be carried great distances in a medium composed of water, mud and gravel, whose density may at best be only an eighth or a tenth that of a nugget. There is no doubt that a failure to recognize the probable source of the placer gold in these creeks has been largely the reason why no quartz veins of importance have yet been found. It seems likely that the auriferous veins which supplied these placers were exceedingly narrow but rich stringers in the schists exposed or cut through by the creek valleys. Much of the gold that has been taken out appears to have been coarse, with irregular edges, and frequently attached to pieces of white quartz similar to the quartz veins exposed in the creeks. A continuation of prospecting for veins of this character may result in satisfactory discoveries, but such veins will only be found by careful and conscientious work on the part of the prospector.

The Cassiar Central Railway Company has secured the privilege of making designations of mineral blocks in the area which extends from the 58th to the 60th degree north latitude and from the 128th to 131st degree west longitude. From within this district the company has the right to designate 70 blocks of land in consideration of building a railway from Glenora to Dease Lake, a distance of about 100 miles. The terms of this mineral land grant are drawn in such a way that independent prospectors or miners retain considerable rights, notwithstanding the advantages which are gained by the company after mak-



EXPLORATION MAP OF CASSIAR CENTRAL RAILWAY LINE; SPECIMEN SHEET.

hundreds of feet of glacial debris, the source of the gold appears quite independent of the glaciers which formerly covered the country.

In 1873-74 gold was discovered in large quantities near Dease Lake, and for several years over \$500,000 per year was taken out. For the last 20 years, during which time work has been confined chiefly to re-washing the same creeks, the annual production has greatly decreased. The total gold taken out and reported up to 1895 amounts to about \$4,775,000, which is no doubt less than the actual production. For some years past the re-washing of old dumps has been carried on by Chinamen, who have remained in the country throughout the year. Estimating the total length of the creeks worked roughly at 50 miles, the yield has been about \$100,000 per mile. There are still considerable distances on these creeks that have not been worked owing to the depth of gravel to bedrock. Hydraulic washing on a large scale has been tried in only a few places, where the results were apparently not altogether satisfactory, probably on account of the mistaken view as to the source of the gold and the manner of its distribution. Large preparations were made to hydraulic banks on the assumption of an even distribution of gold in the gravel. Had the glacial transportation theory been abandoned and bedrock pay streaks of such moderate size as could be expected from the degradation of small rich veins crossed by the creeks, been alone worked, the preparations for washing would have been more commensurate with the amount and value of the gravel to be treated. The disintegrating effect of water and extreme cold and the attrition of the enormous masses of glacial granite boulders that have been rolled down the narrow steep channels of all the creeks is quite sufficient to account for the transportation of heavy particles of gold a short distance and their subsequent concentration in narrow channels and interstices of the bedrock. No one who is familiar with the ra-

ing the designations to which it is entitled. Ground, however, not designated by the company within the above area is freely opened to miners under the British Columbia mining laws, and a large number of claims have been already staked on quartz veins and pyritic ore bodies.

During the last season the company has worked energetically, establishing its stores, offices and warehouses and also in superintending the work of a large party of prospectors whom it engaged. The company owns and operates a river steamer on the Stickine and has made preliminary arrangements for actively prosecuting its work of survey and exploration in the coming season. A railway survey has also been made of the proposed route to Dease Lake. Next season should see considerable activity in the Cassiar District.

INSULATING FREEZING MIXTURES.—In a recent communication, Prof. W. Hempel describes a series of comparative experiments undertaken by him to settle the most suitable substance for isolating a freezing mixture. Starting with a temperature of about -75° to -80° C., produced by solid carbon dioxide and ether, the rate of rise of temperature with time was measured, and as a result, eiderdown was found to be the best insulator, wool carefully dried at 100° C. being nearly as good, and having the advantage of cheapness. Three samples of vacuum tubes, of the pattern invented by Prof. Dewar, were also tried, and were found to give very varying results among themselves, and all being much inferior in insulating power to either eiderdown or cotton wool. Thus with eiderdown a rise of 12° C. occurred in 88 minutes, with dry wool a rise of 20° to 40° in the same time, while the three vacuum-jacketed tubes gave under the same conditions rises of 65°, 69° and 39° respectively. The results, says "Nature," would seem to show that trustworthy Dewar tubes cannot be bought commercially.

QUESTIONS AND ANSWERS.

(Queries addressed to this department should relate to matters within the special province of this periodical, such as mining, metallurgy, chemistry, geology, mineralogy, machinery, supplies, etc. As it is manifestly impossible to devote space to all the questions and notes constantly received, preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot here undertake to give professional advice on problems requiring special investigation and which should be obtained from a consulting expert. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers should send their names and addresses. Anonymous questions will not be answered.—Editor E. & M. J.)

Copper Precipitation.—What is the method of precipitating copper held in solution as chloride, as in the Plattner process?—T. L. D.

Answer.—Copper can be deposited from chloride solution by means of metallic iron. As to the method employed in purifying the solution obtained in the Plattner process of gold chlorination consult any of the general works on metallurgy or on the special metallurgy of gold. For instance, Rose's "Metallurgy of Gold."

Ore Treatment.—Kindly inform me through your columns of the treatment now used to reduce and save the values in an ore containing 10 per cent. cinnabar and native quicksilver, \$4 or \$5 gold and 7 or 8 oz. silver to the ton.—S. L. S.

Answer.—We cannot undertake to recommend or to prescribe a method of treatment for any special ore. You should consult a competent metallurgist, and should also be sure of the nature of your ore.

Bower-Barff Rustless Iron Process.—Can you give me the address of any one in the United States who has the plant necessary for treating metal by this process on a commercial scale?—A. H. P.

Answer.—Some years ago the "Bower-Barff rustless iron" process was advertised in some of the technical papers. In the last two years the advertisements have disappeared, and inquiry has failed to find any one using the process or having it in charge. Perhaps some of our readers may know of a plant in existence; if so, they will do us a favor by giving the information.

Melting of Copper.—Can you tell me how I can determine by theory—specific heat, melting point, etc.—the quantity of coke which would be necessary to melt one ton of metallic copper?—I. C.

Answer.—The melting point of copper is 1,093° C. To determine the quantity of coke required, however, depends so much upon the furnace—that is the proportion of the calorific power of the coke used in any type of furnace—that it is impossible to give any definite rule.

You will find some data which will help you in Peter's "Modern Copper Smelting," Hixon's "Notes on Lead and Copper Smelting and Copper Converting," and Roberts-Austin's "Introduction to the Study of Metallurgy."

Japanese Sulphur Mines.—In your issue of January 14th, 1899, you stated that the sulphur mines of Japan had been closed down. Was the information authentic? What were the unfavorable conditions which closed the mines when 10,100 tons were produced in 1897?—J. A. B.

Answer.—You have misunderstood our statement. It was not that the mines have been closed, but that, referring to the supplies of sulphur used in the United States, "the importation of brimstone from Japan has virtually been stopped, owing to the unfavorable condition of the industry in that country."

Our latest information from Japan is that the production of sulphur has been decreasing, chiefly on account of the increasing difficulty and cost of working the volcanic deposits, the more accessible and easily worked having been partly or wholly exhausted. Moreover, the consumption of sulphur in Japan, in the manufacture of sulphuric acid, is increasing, so that the surplus for export is diminishing yearly.

Mica.—Users and market. What are the sources in the United States from which it is obtained? How does the United States mica compare with the foreign product? Is a good mica mine good property?—J. J.

1. This question has been answered in our columns. See "Engineering and Mining Journal," October 8th, 1898, page 432; December 24th, 1898, page 762; December 31st, 1898, page 792; also "The Mineral Industry," Volume VI.

2. The chief production of mica in the United States is from New Hampshire and North Carolina. A small quantity comes from Virginia and South Dakota. Mica has been found in Montana, Idaho and New Jersey.

3. The quality of the mica found in the United States varies. The better qualities are quite as good as the imported.

4. A good mica mine is good property, as there is an excellent demand, which is increasing, and mica of the best quality is not very abundant.

Gold in Quartzite.—Has gold ever been found in paying quantities in deposits of quartzite rock itself? If so, where? Where gold is found in or near quartzite, does the quartzite act as the formation and other material compose the vein. What part does quartzite play in the

developed mineral deposits of the Black Hills and parts of Colorado?—C. H.

Answer.—Your questions are not quite as definite as they might be. Gold deposits rich enough to work are found in quartzite in many places. The banket formation in which are the great Transvaal gold mines in places is nearly a quartzite. In Nova Scotia there are paying gold mines in quartzites and flinty slates. The best known gold bearing quartzite formation in this country is in the Black Hills. The relation of the quartzite to the gold ore in any place may vary. The quartzite itself may contain enough gold to pay to mill.

In such a case the quartzite is usually richer in certain directions along the bedding planes, forming an ore shoot or lode without any sharply defined boundary. In other cases joints or lines of fracture may cut across the bedding at any angle, and these filled with infiltrated quartz would form quartz veins, often with well defined walls, rich enough in gold to pay for mining. Both these conditions may exist in the same field, as in the Black Hills.

Passage of Sound Through Rock.—What is the greatest distance at which sound can be heard through rock? To be more definite, could the sound of hammers or drills be heard through 90 ft. of rock?—M. T.

Answer.—The answer to the first would depend upon several points, such as the nature of the rock, direction of the sound, whether parallel with the bedding or not, and probably also the "personal equation" of the observer. It is well known that, taking several persons of average acuteness of hearing, there will be a difference in the range of sounds audible to each; one can hear an extremely high note which another cannot, and so also with very low notes. There are records of sound having been heard at distances varying from 30 to 100 ft. through coal in some cases and in others much more. In fact, the distance given varies with each observer, and may be put at from 100 to 250 feet. This may not be the limit, however. We are informed—on the authority of Mr. Morgan Rosser, superintendent of the mine—that the Kingsthorpe Coal Company, near Wilkes-Barre, Pa., recently sank an air-shaft from the surface to the Bennett coal bed. From the time the work was begun the sound of the hammers and drills could be heard by a person standing in the workings directly below. The distance at first was 200 feet, but was, of course, constantly decreasing. The sound traveled through sandstone, coal and slate. The company is now using an air drill in the Bennett bed and the sound can be heard in the Red Ash bed, about 200 feet further below. While opinions vary somewhat, it seems to be admitted that sound travels better through rock than through coal.

Some records of experience as to the distance at which sound has actually been heard through rock would be of interest, and we hope any of our readers who may have made such observations will send them to us.

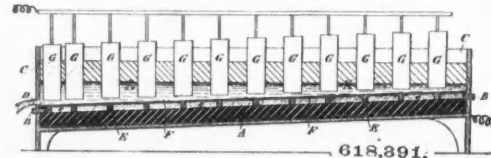
PATENTS RELATING TO MINING AND METALLURGY.

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 January 31st, 1899.

618,391. ELECTRIC FURNACE. Hugues Bovy, Geneva, Switzerland. Assignor to La "Volta" Société Anonyme Suisse de l'Industrie Electro-Chimique, same place. A furnace-body of conducting material, carbon blocks supported in upright position on said body, each of

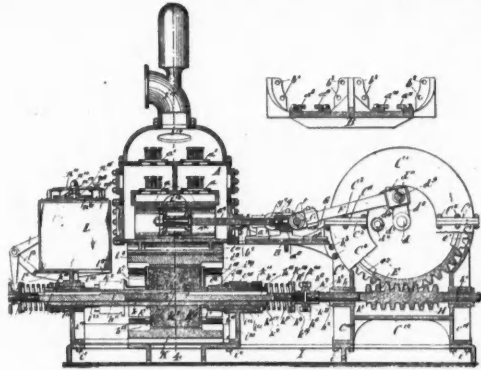


said blocks forming a lower electrode, a filling of carbon powder between the said blocks, carbon plates arranged between the upper ends of said blocks and resting upon said filling, and additional electrodes arranged and supported above said lower electrodes, said lower electrodes being of such size as to be rendered incandescent by the passage of the electric current.

618,404. ELECTRIC PUMP. Carl Eickemeyer, Yonkers, N. Y. The combination, with an electric motor, provided with vertical field-magnet cores, of the incased pumping mechanism driven by said motor, the casing being supported by said field-magnet cores, and the piston-rods and armature-shaft being substantially parallel, a worm connected with the armature-shaft, and a suitably-supported gear-wheel intermeshing with said worm and connected with the piston-rods of the pump.

618,447. CASTING PLANT. Maximilian M. Suppes, Lorain, Ohio. The combination of a horizontal track and a ladle movable along said track, a parallel track and a metal-casting bed movable along said parallel track, and a plurality of rotatable metal-reservoirs located between the said tracks and each having a horizontal runner secured thereto and adapted to extend over said casting-bed.

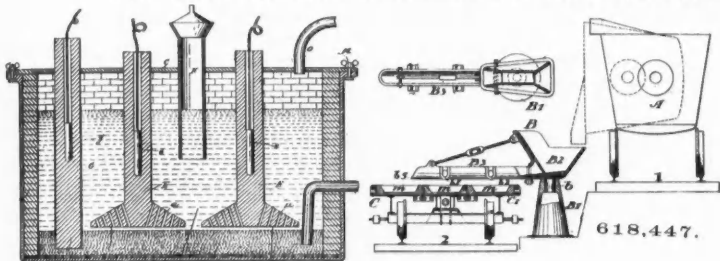
618,535. MACHINE FOR MIXING ASPHALT. Howard H. Butler, New York, N. Y. Assignor of two-thirds to Lucius A. Rockwell and Charles S. Fowler, same place. In a mixing-machine, in combination with a casing member provided with edge surfaces forming an opening into said casing, of a closer member for said opening also provided with edge surfaces; the edge surfaces of one of said members terminating in a knife-edge adapted to form a seat for the edge surfaces of the other member; and a means of operating said closer.



618,404.

618,549. **GAS GENERATOR.** Paul A. N. Winand, Philadelphia, Pa. Assignor to the Otto Gas Engine Works, same place. The combination of a water-jacketed gas-engine, a moistener, a producer, a connection for conveying the heated water from the jacket of the engine to the moistener, a connection for admitting air to the moistener to cause it to come in contact with the heated water from the jacket of the engine, and a connection for conveying the air and absorbed watery vapor from the moistener to the producer.

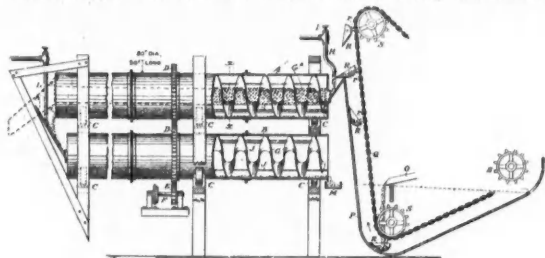
618,575. **METHOD OF AND APPARATUS FOR PRODUCING CHLORINE, ZINC OR OTHER METALS FROM MIXED ORES.** Farnham M. Lyte, London, England. The process for treating complex sulphide ores consists in grinding the ore; then calcining it at a low red heat to convert the zinc sulphide into zinc sulphate, in extracting the zinc sulphate formed by lixiviation, in converting the zinc



618,575.

sulphate into zinc chloride by treating it with an alkaline chloride and refrigerating, in concentrating the zinc chloride formed and rendering it anhydrous by heating it in the presence of metallic zinc with production of zinc oxide and evolution of hydrogen, and in subsequently decomposing first the zinc oxide and then the zinc chloride by means of electrolysis with an anode of carbon and a cathode of fused metallic zinc for the production of chlorine and metallic zinc; recovering the lead and silver by smelting.

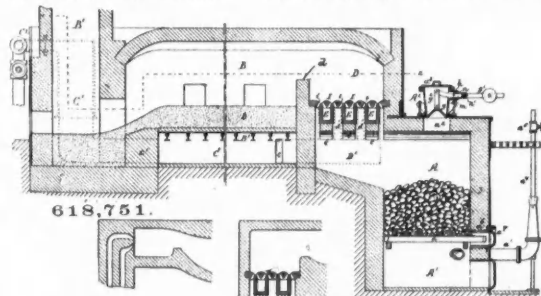
618,622. **APPARATUS FOR EXTRACTING METALS.** Philip Somerville, Bishop, Cal. Assignor to the California Agitating and Leaching Machine Company, same place. An apparatus for extracting metals consisting of parallel barrels having annular disks closing one end with central inlet-openings for the material, a framework and roller support for said barrels, means whereby the barrels are ro-



618,622.

tated in opposite directions, spiral flanges fixed to the interior of the barrels for advancing the material, devices for feeding material and fluid matter to the uppermost barrel, means for separating the coarse from the fine material and delivering them separately, and means for transferring material from the discharge end of one barrel into the inlet end of the barrel below.

618,751. **METALLURGICAL FURNACE.** David Townsend, Philadelphia, Pa. The combination of a series of notched air-ducts located adjacent to the combustion-chamber with notched bricks having sections adapted to the notches in the air-ducts, one series of bricks ex-



618,751.

tending across the ducts, and the other series of bricks extending across the spaces between the ducts and forming air and gas passages.

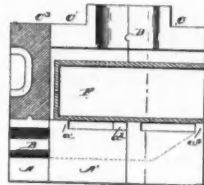
618,623. **PUMPING APPARATUS FOR DEEP WELLS.** William A. Springer, Sturgeon, Pa. The combination with a pump-barrel having a solid reciprocating piston operating therein, and a stationary lifting and discharge valve mechanism connected at the end thereof, of ports or passages leading upwardly from the interior chambers between

the valves and terminating in a perforated passage or thimble within the pump-barrel below the piston.

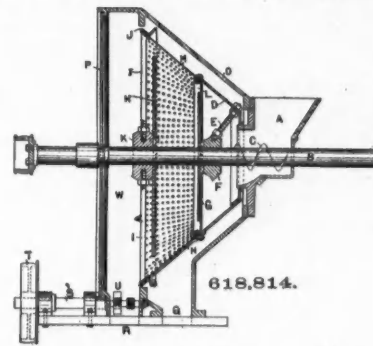
618,635. **ELECTRIC BATTERY.** Arthur R. Adams, Surrey, England. The process of compounding an exciting fluid for electric batteries consisting in preparing first a chromate solution, adding sulphuric acid, then adding a solution of a nitrate of the alkali metals; then adding a solution of a mercury salt and then mixing thoroughly at a temperature of about 150° F.

618,678. **MECHANISM FOR OPERATING MINE DOORS.** Alfred N. Humphreys and Edward McGrew, Irwin, Pa. The combination with the door, of an intermediate wheel-bar and two terminal wheel-bars mounted to rise and fall alongside of one of the tramway-rails, connections between said bars by which they move simultaneously and in unison, swinging weights connected with the bars to return them to normal position, and means for transmitting the movement of the bars to the door.

618,768. **ASSAY FURNACE.** John H. Bapty, Helena, Mont. An assay furnace having its base formed in sections with upwardly-extending muffle-supporting blocks thereon, the said blocks at the forward end of the furnace extending the width of the muffle-chamber, arch-sections resting on the base-sections outside of the muffle-



618,768



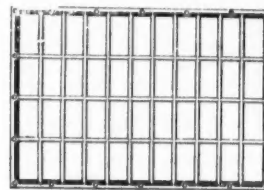
618,814.

supporting blocks and forming the muffle-chamber, a muffle resting on said blocks and bridging the muffle-chamber, a muffle-chamber-closing section at the rear end of the furnace and a base-section upon which the muffle-chamber-closing section rests having an entrance-aperture for the combustion-chamber.

618,772. **PROCESS OF MAKING ALKALI ALUMINATES.** Henry S. Blackmore, Mount Vernon, N. Y. The process for transforming salts into aluminates and eliminating original combined acid consists in melting the salt to be transformed and introducing into the molten mass aluminum hydroxide or aluminum oxide containing absorbed or occluded elements of water.

618,814. **CENTRIFUGAL MACHINE.** John H. Darby, Brymbo, England. The combination of a suitable casing provided with a feed-opening at one end, and a discharge-opening at its opposite end; a shaft mounted in said casing and extending through said feed-opening; a worm carried by that portion of the shaft within said feed-opening; a frusto-conical shell mounted upon the shaft within the casing, comprising an imperforate section D, and a perforate section M connected thereto and extending toward the discharge-opening; and disks G and H mounted upon the shaft.

DESIGN No. 30,106. **SCREEN-SUPPORTING FRAME FOR MINERAL OR ORE WASHING JIGS.**—Charles J. Hodge, Houghton, Mich. The



80,106.

design for a screen-supporting frame for mineral or ore washing jigs substantially as shown.

GREAT BRITAIN.

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

Week Ending December 31st, 1898.

29,572 of 1897. **CHLORINE PRODUCTION.** J. C. Richardson, London. The use of chloride of iron and permanganate of potash to produce chlorine as a solvent for gold in ores.

29,721 of 1897. **GOLD EXTRACTION FROM SOLUTION.** J. C. Montgomerie, Dalmore, Scotland. Extracting gold from solutions by filtering through a bed of charcoal and zinc.

21,760 of 1898. **COKE OVEN.** A. D. de Micheroux, Namur, Belgium. Detailed improvements in coke ovens for the recovery of gases, etc.

22,871 of 1898. **SLIMES TREATMENT.** A. M. Nicholas, Bulong, West Australia. Arrangement of filters for slimes, so as to make the process continuous.

23,027 and 23,924 of 1898. **ROCK DRILL.** G. W. Elliott, Sheffield. Improvements in percussive rock drills, chiefly for taking up wear.

Week Ending January 7th, 1899.

29,611 of 1897. **PLACER MINING MACHINE.** W. F. Lay, New York, U. S. A. Steam-driven monitors and suction pumps for drawing the gravels through proper separating houses.

30,053 of 1897. **TIN ORE TREATMENT.** J. Hutton, Glasgow. Fluxing tungsten and tin ores with soda, to remove the tungsten.

2,203 of 1898. **BLAST FURNACE FEED.** B. H. Thwarte and F. L. Gardner, London. Improved feed for blast furnaces that will not interfere with the recovery of gases.

5,568 of 1898. **ALUMINUM BRONZE.** P. E. Secretan, Paris, France. Aluminum bronze with an admixture of 1/2 per cent. of magnesium.

17,334 of 1898. **ROCK DRILL.** Jackson Drill and Manufacturing Company, Denver, Colo., U. S. A. Improvement in rock drills.

23,982 of 1898. **AMALGAMATOR.** J. E. Sutphen, Albany, N. Y., U. S. A. A revolving amalgamator with a heavy cylinder inside.

PERSONAL.

Mr. F. J. Martin, superintendent of the Fortuna Mine at Fortuna, Ariz., is in San Francisco.

Mr. A. T. Eagar, formerly superintendent Occidental and Utah mines, Virginia, Nev., has gone to Mexico.

Mr. R. N. Dickman of Chicago has gone to Deadwood, S. Dak., to examine a gold mine for a Chicago company.

Mr. Sydney Smith of Nevada City, Cal., is in New York on business connected with mines in Trinity County, Cal.

Mr. G. F. Hamilton has been appointed mining engineer for the Sunday Creek Coal Company, at Corning, O.

Mr. J. Langeloth, president of the American Metal Company, has returned to New York from a business trip to Europe.

Mr. H. K. Shockley of Cincinnati, O., who is interested in mines in California, has returned to the East from San Francisco.

Mr. A. C. Cass, vice president of the Colorado Fuel and Iron Company, is to make a trip to China and Japan to look after the development of the export trade.

Mr. Charles Wade Stickney of Antelope, Idaho, who has been for five years past general manager of the Phi Kappa Mining of London in Custer County, has been admitted to the Idaho bar.

Mr. John F. Jones, formerly foreman of No. 5 mine at South Wilkes Barre, Pa., has been appointed assistant general inside superintendent of all the mines of the Lehigh & Wilkes-Barre Coal Company.

Mr. G. E. Kedzie, who installed and has been operating a pan amalgamating and chlorination plant at the Promontorio mines in the State of Durango, Mexico, will return to Durango from Santiago Papaquaro, on March 1st.

Mr. Russell L. Dunn, mining engineer, is at present in New York, after two years spent in Siberia and Alaska. In the former country Mr. Dunn obtained an excellent insight into the industrial conditions. While in Alaska he examined a considerable section of country.

Mr. Eugene L. Ashley of Glens Falls, N. Y., has sailed from New York with a party, consisting of an engineer and mining expert, sent out by a number of capitalists, some of whom are interested in The International Paper Company, to investigate the sources of the sulphur supply of Chile and Peru, with a view to purchasing and developing whatever properties may be acquired.

Mr. Theodore Nikolesco, a young Roumanian engineer, is now in New York. He has been traveling in the United States, Mexico and South America, for the purpose of acquiring experience in his profession. Mr. Nikolesco has diplomas and testimonials from New York, St. Louis, New Orleans and other cities where he has done very acceptable work. He intends to spend some further time here before returning to his native country.

Mr. Arthur has been appointed general manager of the Illinois Steel Company, with headquarters in Chicago. He has been in the employ of the company for five years, the most of that time as superintendent of the works at South Chicago. Previous to that he was associated with the Union Steel Works for five years.

Mr. William E. Baker has been appointed general superintendent and chief electrical engineer of the Manhattan Elevated Railroad in New York City. Mr. Baker for several years was in the employ of the Thomson-Houston Electrical Company, and had charge of the installation of electrical equipment on the West End Street Railway system of Boston. He has been superintendent of the Metropolitan West Side Elevated of Chicago and was at different times connected with Northern Pacific, Canadian Pacific and International & Great Northern.

OBITUARY.

Henry K. Adams of New York city died on February 10th. He was at one time owner of the Oxford gold mine in Nova Scotia.

SOCIETIES AND TECHNICAL SCHOOLS.

Engineers' Society of Philadelphia.—At the meeting on February 4th, 85 members and visitors were present. Mr. P. J. A. Maignen presented the paper of the evening upon "Water Purification for the City of Philadelphia." After giving the details of the reservoir and pumping capacities and the amount of water consumed by this city, he described the features of the plan proposed for purifying the supply by filtering

through sand, covered with asbestos fiber, roofed over and inclosed. On account of the value of land, it is proposed to erect the filters in two or more tiers in a filter-house beside each reservoir, and plans and elevations of drawings were reproduced by the electric lantern showing the arrangements suggested. The bacterial efficiency of sand filters and the method of keeping the filters in good order were described.

The subject was discussed by Messrs. F. J. Firth (in writing), E. R. Landis, William Easby, Jr., Silas G. Comfort, E. M. Nichols and the author.

Mr. W. M. Stine was elected to active membership, O. T. Knight and W. Musgrave Wood to junior membership, John L. Moyer and Benjamin F. Stradley to associate membership, and Messrs. James B. Bonner, J. Ogden Hoffman and J. W. Ridpath were transferred from associate to active membership.

Engineers' Society of St. Paul.—At the regular meeting on February 7th, 13 members and one visitor were present. A verbal report of Committee on the Naval Personnel Bill was accepted. President Estabrook then called on Mr. Hogeland, who read a paper on "Locomotive Coaling Stations." He illustrated by drawings and photographs the evolution of coal handling for locomotive use on the Great Northern Railroad. Beginning with the primitive derrick and bucket system and a cost of 17c. per ton, he described various stages; (1) shoveling into shoot pockets; (2) dumping and chain conveying to shoots; (3) dumping directly into shoot, coal car being raised by 15 H. P. gasoline engine. The Great Northern moves 750,000 tons annually, through shoot pockets of 5 or 6 tons' capacity at an average cost of 3c. per ton, by measurement. Mr. Truesdell followed Mr. Hogeland with a description of improvements at the South St. Paul Stock Yards, 172 acres in extent, bounded on the river side by 1½ miles of levee. Mr. Wilson, having arranged an exhibit of asphalts, crude and refined, rock, plastic and semi-liquid, passed around prints and photos, and said a few words on the sources of American asphalts, Trinidad, Bermudez, Kentucky, California and Utah deposits were considered, physically, chemically and geologically, but briefly, as the hour was late.

Franklin Institute.—At the meeting of the mining and metallurgical section of the Franklin Institute on February 8th, papers were read by Mr. John M. Hartman of Philadelphia, on "Notes on the Reduction of Iron Ores," and by Mr. Edwin Swift Balch of Philadelphia, on "Subterranean Ice Deposits in America." Mr. Hartman reviewed the past and present practices involved in the reduction of iron ores, giving detailed accounts of the various ores in use and methods of reducing iron.

Mr. Balch's communication was, in brief: Subterranean ice deposits are found in America from Alaska to Tierra del Fuego, and, though rare, are more frequent than is generally supposed. In the United States proper, such deposits are known in Washington, Oregon, California, Montana, Wyoming, Colorado, Arizona, Iowa, Missouri, Indiana, Virginia, Pennsylvania, New York, Connecticut, Massachusetts, Vermont, New Hampshire and Maine. In the Western States are the biggest ice-bearing caves; in the Eastern ones the ice is mostly in taluses and wells. The terminology of the subject is very confusing. "Ice Cave" and "ice gorge" do not cover all the geological formations. The German division into "ice caves" and "windholes" is also not clear. The only term which seems comprehensive and accurate is the French "glaciere naturelle," which might be translated into "natural refrigerator." This term, or one like it, should be used for all places where there is ice underground. When there are draughts through a subterranean hollow, then the term "windhole," or "blowing cave" is accurate, whether there is or is not any ice. Observations in a number of these glaciers in the Appalachians in 1898, showed that the very hot summer of that year affected the supplies of ice, in one or two places entirely destroying it where it is generally perennial. Everything showed that the cold of winter alone is the producer of the ice, which lingers, despite the heat of summer, owing to its being well sheltered. There is no proof that evaporation ever forms ice underground. All other suggestions as to its mode of formation may be neglected.

INDUSTRIAL NOTES.

The Phillips Mine Supply Company, of Pittsburg, Pa., has filled an order for coal cars having a capacity of 100 bushels for a Wyoming concern.

The Utica Gas Engine Works of Utica, N. Y., of which H. R. Illingworth and J. J. Lanz are proprietors, is building gas and gasoline engines of the 4-cycle type, from 2 to 20 H. P.

The Pittsburg office of the Playford Stoker Company has secured a contract from the Ford

Plate Glass Company, Toledo, O., for eight 250 H. P. stokers, to be installed in the new glass plant the company is erecting.

Mr. Juan Cuyas is to represent the Ingersoll-Sargent Drill Company of New York in Mexico with an office in Mexico City. Mr. F. Schreiber, a mechanical engineer for the same firm, will start soon on a trip to Europe.

Among recent orders, the Emerson Electric Manufacturing Company, of St. Louis, has received one from Argentina for 30 alternating current ceiling fans and one from China for 48 fan motors and 24 ceiling fans.

De Staebler Brothers, of St. Louis, have taken the agency of the Reilly pumps and air compressors for Missouri, Arkansas and southern Illinois. The Reilly pumps are manufactured by the National Foundry and Machine Company, of Louisville, Ky.

The Mine and Smelter Supply Company of Denver, Colo., has purchased the business of the Utah & Montana Machinery Company, of Salt Lake City, and established a branch office, where it will carry a stock of machinery as in Denver and the City of Mexico.

The Cherokee Lanyon Smelting Company is preparing to increase its output at its Pittsburg, Kan., smelter as soon as it obtains ore. Smelters 11 and 5, which suspended work some time ago owing to competition by natural gas plants, are to start again, owing to the high price of spelter.

The Ludlow-Saylor Wire Company of St. Louis recently received an order for wire screen from Vladivostok, Siberia. The company reports that it finds the present demand for wire screens and wire cloth is very heavy, and that it has taken some of the largest single orders in its history.

The Hall Steam Pump Company of Allegheny, Pa., has put two compound air compressors for the salt wells of the United Salt Company of Cleveland, O. The company also received recently an order for two duplex cross compound compressors with 18-in. low pressure cylinders for the Lorain Steel Company, Lorain, O.

The Von Wachtel Chemical Company, limited, has been organized in Bethlehem, Pa., with Joseph J. McKee, president. It is the purpose of the concern to manufacture high grade chemicals, which are now only imported. The works are located in West Bethlehem. Dr. Von Wachtel of Berlin, Germany, is superintendent.

The Lane & Bodley Company of Cincinnati, O., has built the Newport, Ky., Rolling Mill Company a heavy duty Corliss engine, with cylinders 34 by 72 in. The bed of the engine is cast in one piece, making a massive casting weighing 50,000 lbs. The fly wheel of this engine is unusually large and heavy, measuring 30 ft. in diameter and weighing 132,000 lbs. in the rough.

Two blowing engines, each weighing 1,100,000 lbs., are being built by the E. P. Allis Company of Milwaukee, Wis., for the Duquesne blast furnaces of the Carnegie Steel Company. The engines have 50-in. high pressure cylinders; a 96-in. low pressure cylinder, two 96-in. air cylinders, a stroke of 60 in., and will pump 50,000 cu. ft. of air a minute. They will be ready in two months.

The new blast furnace at Deseronto, Ont., is now ready to begin the manufacture of charcoal pig iron. The output of the furnace will be about 35 tons per day. Already, 12,000 tons of hematite ore are on the grounds, while the Rathburn Company, of Deseronto, has contracted to supply the charcoal necessary at 4c. per bushel. This is the only charcoal iron furnace in Canada.

The United States Navy Department has awarded the Brown Hoisting and Conveying Machine Company of Cleveland, O., a contract for coal handling machinery for the coaling station at Mare Island Navy Yard, Cal. The Brown Hoisting and Conveying Machine Company has also been awarded the contract for a 100-ton steel floating crane for the Brooklyn Navy Yard that will weigh over 1,000 tons.

The American Steel and Wire Company has, it is stated, acquired the wire, rod and wire nail property of A. R. Whitney & Company, who own the new mill of the Portage Iron Company, Limited, at Duncansville, Pa. A. R. Whitney has been made a director of the company. It is also reported that the trust has secured control of the Puget Sound Wire and Steel Company, of Everett, Wash., which was practically controlled by the Rockefeller interests.

At a meeting of the stockholders of the Philadelphia Company in Pittsburg, Pa., on February 16th, the capital stock of that company was increased from \$7,500,000 to \$21,000,000. Of the increased stock, \$6,000,000 is to be preferred stock, bearing 5% dividends, non-cumulative. The indebtedness of the company was ordered to be increased by the issue of \$6,500,000 5% gold bonds to run 50 years. This increased capital is to

take in the gas companies of Philadelphia and Western Pennsylvania, for which negotiations have been in progress for some time past.

The Marion Steam Shovel Company of Marion, O., that manufactures the Barnhart steam shovel which has done good work at the iron mines of the Mesabi Range in Minnesota, is now employing about 240 men on full time. A complete shovel is turned out every three days. Electricity and compressed air are utilized about the factory, the company manufacturing its own air compressors and air hoists, while all riveting is done by pneumatic riveters of the company's design and manufacture. There are nearly 20 miles of tracks in the company's yards.

Furnace C of the Maryland Steel Company's Sparrow's Point Furnace, near Baltimore, Md., has been relined and is now producing Bessemer pig from a mixture of Mesabi and Cuban ores.

Coming shipments include 3,000 tons of light rails to Havana for the United States Railway Company. These, it is said, will be the first rails ever sent to Havana from the United States. Other shipments will be 5,200 tons of steel rails for Rangoon, 1,600 tons of steel plates for English shipbuilders. The British steamship Bramble will shortly discharge 2,000 tons of iron ore from Santiago.

The Carnegie Steel Company, which recently decided to manufacture steel cars, and is to build a plant near Homestead, has secured an order from the Baltimore & Ohio Railroad for 2,000 cars. J. B. Hardie has been appointed chief engineer of the new plant. Orders for over 4,000 more cars have been received. The plans for the plant contemplate a capacity of 100 cars a day. Outside of the air brakes, to be made by the Westinghouse Air Brake Company, all the parts of the cars will be made by the Carnegie Company. Rolled structural shapes will be used instead of pressed steel shapes.

The General Chemical Company of Phillips-ton, N. Y., has been incorporated with a capital of \$25,000,000. Of this amount \$12,500,000 is preferred and \$12,500,000 common stock. The preferred stock is to bear a 6% cumulative dividend. The company will manufacture in New York State and elsewhere all kinds of chemicals. The directors are William H. Nichols, S. H. Steele, George W. Kenyon, Charles Robinson Smith, James L. Morgan, Jr., Louis S. Wolf and J. Herbert Bagg of New York City; Eugene Waugh of Highlands Station; Frederick Phillips of Philadelphia, Pa.; C. P. Tiero of Pittsburg, Pa.; E. H. Rising of Cleveland, O., and H. F. Chappell and H. W. Chappell of Chicago, Ill.

The American Wire and Steel Company has elected the following officers as a New Jersey corporation: President, John Lambert; first vice-president, Wm. Edenborn; second vice-president, Isaac L. Ellwood; third vice-president, Stewart W. Chisholm; fourth vice-president, Philip W. Moen; secretary, C. S. Roberts; assistant secretaries, O. Owen and E. E. Patterson; treasurer, W. A. Green; assistant treasurers, F. L. Watson and F. P. Adler. Directors—John W. Gates, Isaac L. Ellwood, Wm. Edenborn, Henry Seligman, John Lambert, Stewart W. Chisholm, Frederick P. Voorhees, Wm. P. Palmer, Philip W. Moen, Frederick Strauss, George T. Oliver, Francis M. Drake, Chas. S. Boynton, James Hopkins and Chas. C. Howard.

William Clifford, Pittsburg, Pa., is building a large ventilating fan for the Hoosac Tunnel, in Massachusetts. This fan will be placed at the top of a shaft 1,050 ft. deep, in the center of the mountain, and will be driven by electricity generated at North Adams, 5 miles distant. The fan is now being built at the Ft. Pitt Bridge Works, Canonsburg, Pa. If it prove successful a larger one will be built to be 16 ft. in diameter and 8 ft. wide, with double inlet, to be driven by a 125 H. P. motor. The tunnel is 4½ miles long. Mr. Clifford has contracted to erect a third fan for the Spring Valley, Ill., Coal Company, to have a capacity of 150,000 ft. per minute, at 5 in. of water gauge, identical in construction with those placed in the other two mines. Another large fan will be furnished the First Pool Monongahela Gas Coal Company's mine, at Willock Station. This will have a capacity of 300,000 ft. per minute, being 13½ ft. in diameter, with double inlet.

TRADE CATALOGUES.

The Gravity Boiler Feeder Company of Little Rock, Ark., publishes a small folder describing the company's system of heating feed water for boilers.

The Smith-Vaile filter press for collecting gold slimes at cyanide process mills is illustrated in circular No. 6, issued by the Stillwell-Bierce & Smith-Vaile Company of Dayton, O.

The Royal Electric Company of Peoria, Ill., issues a series of bulletins describing the alternating current generator and transformers it manufactures. The February bulletin tells of

alternating generators of the inductor type and contains an illustrated description of one of the company's 150 k. w. generators.

J. H. Williams & Company, of Brooklyn, N. Y., manufacturers of iron, steel, copper, bronze and aluminum drop forgings, issue a 40-page catalogue, describing some of the forgings they carry in stock, including wrenches in a variety of patterns, thumb nuts and screws and bicycle forgings. The firm also makes to order forgings for cable transmission machinery, dynamos and motors, rock drills and mining machinery, steam, gas and hot air engines, steam pumps and oil well apparatus.

The Ingersoll-Sergeant Drill Company's catalogue No. 41 is entitled "Mining, Tunneling and Quarrying Machinery." It describes the various types of drills manufactured by this company, including the "New Ingersoll" and the "Arc Valve" tappet. In the book, 30 of the 104 pages, contain descriptions of drill mounts, channels and gadders for quarry work. The catalogue contains much useful information, and the drills described are in use in many remote parts of the earth. The company sends the catalogue on application to the office in New York City.

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, and shall be pleased to furnish them information concerning goods of any kind and forward them catalogues and discounts of manufacturers in each line.

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, nor have they any pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

Oil Exports.—The Bureau of Statistics reports the exports of mineral oils from the United States in January as follows: Crude, 7,467,713 gals., against 8,835,695 gals. in January, 1898; naphthas, 1,482,331 gals. (against 1,070,538 gals.); illuminating, 45,796,292 gals. (67,074,120 gals.); lubricating and paraffin, 4,698,306 gals. (5,304,614 gals.); residuum, 2,941,134 gals. (3,127,950 gals.); total, 62,385,776 gals., against 85,412,917 gals. in January, 1898.

ALABAMA.

Coal Production.—The annual report of the State Mine Inspector shows that the coal production last year was 6,504,960 tons, an increase over the preceding year, which broke all previous records, of 611,189 tons. The average number of days worked was 300, practically every day except Sundays and holidays. The demand is still as heavy, and all the mines are working 6 days a week, with no trouble anywhere.

The production by counties was as follows: Jefferson, 4,088,054, an increase of 333,278 tons; Walker county, 1,173,339 tons, an increase of 135,822; Bibb, 807,400, an increase of 136,329; Tuscaloosa, 218,803; Shelby, 74,041; Winston, 7,830; St. Clair, 72,808; Etowah, 5,844; Blount, 37,500.

ALASKA.

Sumdum Mining Company.—The Sumdum Chief and the Bald Eagle Mining Companies, at Sumdum Bay, have been consolidated under the above name, paid up capital, \$200,000. The quartz mines are over 60 miles north of Juneau. N. S. Trowbridge will remain as manager, and H. S. Gripp will continue as superintendent of the mines.

Douglas Island.

Alaska Treadwell Gold Mining Company.—The statement for January shows 20,836 tons ore treated in the mill. The total yield in gold was \$43,043, or \$2.06 a ton. Of the bullion, \$14,785 came from concentrates (sulphurets) treated by chlorination.

ARIZONA.

Yavapai County.

Copper Chief Mining Company.—This company, capitalized at \$3,000,000 in 120,000 shares of \$25 each, is to develop the Scheurmar-Duke group of claims. The incorporators are: Franklin A. Burke, Colorado Springs, Colo.; William Z. Larned, John A. Penniman, Charles E. Day, and Leroy A. Gibby, of Summit, N. J.

Crowned King.—A great strike of free gold ore is reported in this mine in Bradshaw Basin, 36 miles south of Prescott. The vein, we learn from good authority, is 6 ft. thick, and some of the narrow pay streaks are very rich.

The officers of the company are: N. C. Shekels, president and general manager; R. Wilkinson, vice-president; J. M. Taylor, secretary; B. A. Turner, assistant secretary; Geo. P. Harrington, treasurer and general superintendent, and R. H. Hetherington, resident agent.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Bay State.—At this mine, 4 miles north of Plymouth, the water has been pumped out, and sinking is progressing rapidly in the double compartment shaft. The 20-stamp mill is being run continuously.

Calaveras County.

(From Our Special Correspondent.)

Ford.—The 10-stamp mill at this mine, ¼ mile east of San Andreas, is almost completed, and will probably be crushing in a few days. The mill and air compressors will be operated by electricity, and the hoist by steam. The mine has been developed down to the 750 ft. level and is now full of water up to the 300 ft. About 1,500 tons of good milling ore is one the dump.

Union League.—This gravel mine, just east of San Andreas, is being worked by a large force. The mill will be completed soon, and arrangements are being made to operate it by electric power. The hoisting is to be by steam power, and water for the battery will be pumped from the mine into large tanks. A large lot of gravel is on the dump.

Shasta County.

(From Our Special Correspondent.)

Elizabeth.—This placer mine, near Keswick, is being worked by L. Schuckman, with good results. The working force is to be increased.

Sam Houston.—A rich strike has been reported at this mine, at Old Diggings. This claim is an extension of the old Texas Mine, and is owned by San Francisco parties, who are developing it under the management of J. H. Morton.

Texas.—The water in this mine, at Dry Diggings, is down 200 ft., and in about 10 days the works will be clear. W. O'Donnell is reported to be examining the property with the view of purchasing the same.

Siskiyou County.

(From Our Special Correspondent.)

Sheeba Gold Mining Company.—This company has been organized by Boston and San Francisco parties to develop 3 quartz claims, located about 9 miles from Fort Jones. There are 2 parallel veins which are opened up by a tunnel and a 3-compartment shaft to a depth of 100 ft. Sinking will be continued and drifts run. The main vein is said to be 20 ft. wide, showing high-grade ore, some of which is being sacked and shipped to the smelter. The plant consists of a steam pump, a hoist capable of sinking 1,000 ft., a 10-stamp mill put in by the Union Iron Works, of San Francisco, 2 Frue concentrators and engines, boilers, etc. The mill is located at the mouth of the tunnel. The steam plant is only used when the water supply is short. James McCraw is superintendent.

COLORADO.

Clear Creek County.

In a snow slide near Silver Plume on February 12th, over 20 Italian miners are reported instantly killed. A short distance from the starting point the avalanche parted, one section coming from Cherokee Gulch, taking with it two cabins occupied by Italians and the shaft house of the Cary City Mine. The other slide came down William Gulch, between the Pelican and the Seven Thirty Mines. This portion of the slide did the most damage. Settlements of miners, mostly Italians, were situated in both gulches.

(From Our Special Correspondent.)

Anchor.—Stephens Brothers, of Freeland, have been doing considerable development on this group of claims. A shaft disclosed a nice body of lead ore. A tunnel cut a cross-lode, where drifting shows a nice body of lead ore. When the Anchor lode was cut drifts were begun in both directions. The east one cut an ore shoot that shows a better grade of mineral, with gold values. This ore is running 16.3 oz. gold, 80 oz. silver, and 13% lead to the ton. The pay streak measures 30 in. across.

Gum Tree Gold Mining and Milling Company.—Manager John Owen, at Idaho Springs, says that the New York and Massachusetts interests in this group of claims have come forward with plenty of money for development work, and that sinking will be resumed within 10 days. This shaft will go down on the Gum Tree vein, which carries 3 ft. of lead and copper ore where opened in the lower level. The Belmont vein of the same group has also opened into better mineral within the past week.

Knickerbocker Tunnel.—At the breast this tunnel, in Bellevue Mountain, at Idaho Springs, shows pay ore, with neither wall yet found. This ore is high grade, and being well adapted for concentrating. While the tunnel is now following one vein, it is also crosscutting the mountain. The heading is now under the Emerson claim, which had a record for rich ore when worked in the earlier days.

Lamartine.—Development continues at this mine, near Idaho Springs, and the tunnel has now been driven over a mile. It cut the shaft

at 900 ft., and 1,500 ft. to the west opened into new pockets of ore that are proving of more value than those near the shaft. The owners have acquired additional claims, and now have about 30 full patented ones in the group. They will push the lower drift ahead, the tunnel now being driven on one of the veins, in the hopes of coming to more ore bodies. It is more than probable that the tunnel will be driven for a mile, if necessary, to come to another deposit. It is now under the surface of the mountain for 1,000 ft., and is gaining some depth. The ore is entirely smelting, and ranges in value from \$60 to over \$1,000 per ton. The tunnel is now in virgin ground, no finds of ore ever having been made there before at such depth. Shipments from the find are becoming very heavy.

Silver Age Mill.—W. E. Renshaw, of the Gem Extension and Santa Fe mines, has secured control of this mill, and will work it in connection with the Newton Mill. I have just made some surprising tests of the saving. Ore has been assayed before treatment at the Newton Mill. The product after treatment and the settlement assay on 120 tons of the ore shows a saving of 95%. This is remarkable, and while Mr. Renshaw had been claiming a high saving by his system of concentration it was thought that about 90% would be the result. The ore was treated for the Sun & Moon Company, of Idaho Springs.

West Point Mining Company.—This company has bought the Gladstone claim, at Idaho Springs, and arrangements are about completed for putting in a plant of machinery. The shaft will be sunk to 500 ft., and the adit on which most of the work has been done will be continued into the hill. A winze from the adit disclosed the better grade mineral, and on this the shaft will go down. The purchase price was \$25,000, claimed to be in cash.

El Paso County—Cripple Creek.

Portland Gold Mining Company.—At the annual meeting of the stockholders, the following directors were elected: James F. Burns, F. G. Peck, W. S. Stratton, John Harnan and Irving Howbert. None of the officers or directors were in attendance at the meeting, the stockholders present being Thomas F. Burns, brother of James F. Burns, A. T. Gunnell and T. M. Patterson. These three held proxies for practically all the stock. James A. Doyle was represented by George S. Wright, one of his local attorneys, who held a proxy for a block of 500 shares. The treasurer's report showed the receipts during 1898 to have been \$1,890,641, and the expenditures \$881,833, leaving a net profit of \$1,008,808. For the year \$570,000 was paid in dividends and \$77,453 on account of new acquisitions. The production of ore from January 1st to December 31st, 1898, was 27,798 tons, of a gross value of \$1,879,682. The total production of ore from April 1st, 1894, to December 31st, 1898, was 109,591 tons, of a gross value of \$6,427,523.

Fremont County.

(From Our Special Correspondent.)

Aberneathy Mill.—The mill, on Four Mile Creek, is nearing completion and will be ready for operation March 1st.

Galveston Tunnel.—Chicago people are investigating this proposition with a view to purchase. The ore is free milling, with an average of \$4 in gold.

Junior Order.—The cyanide plant on this working has been frozen for 2 months.

Last Chance.—The Galveston company is mining 2 shifts in this Bare Hills working, and piling up ore for its cyanide mill to be erected in the early spring.

Mayflower.—The Seven Sisters Mining Company, operating the Mayflower in the Bare Hills District, resumed work with 3 shifts on February 1st.

Gilpin County.

(From Our Special Correspondent.)

Ore Outputs.—For January the Concrete produced 170 cords, or 1,450 tons, of mill ore; the Cook, 3,200 tons of mill ore, with 750 tons of concentrates and smelting ore, making it the biggest individual producer in the county, and the Kansas-Burroughs Consolidated Mining Company, 2,960 tons of mill ore.

Snowstorms and Production.—The recent heavy snowstorms have retarded mining greatly. The lines of the Tramway Company have been badly blocked. Coal has been scarce, as very little has been brought up by the Colorado Road, and that little had to be used for domestic purposes. Several properties have suspended operations, while others have partially suspended. A good many miners have been laid off, and at the mills in Black Hawk many stamps were hung up. Saturday, February 11th, was the big monthly pay day of the camp, and it is estimated that the recent storms made a shortage of about \$50,000 in the amount of wages dis-

bursed. It is expected that the blockade will be partially over during the coming week.

Ayres-Leavenworth-Topeka.—Sinking has started at a depth of 600 ft., and a good body of mill ore has been opened, from which shipments are being made. Manager Lowe reports the following returns from the last shipment of 27,355 lbs.: The second class ore went 34.6 oz. gold and 12.2 oz. silver, bringing a value of \$655 per ton, and carried 70% silica, while the third class ran 5.9 oz. gold and 8.32 oz. silver, or \$101 net per ton; this class has 12% zinc.

Crown Point & Virginia.—A new boiler is to be put up at once on this Central City mine, as the old one has been condemned by the boiler inspector. The property is looking well. Mr. Frank Stansfield is Manager.

Gilpin County Concentrating Company.—This company, with a capital stock of \$9,000, has been incorporated, with main office in Denver, and S. M. Towne, N. M. Davis, H. Apple, C. B. Davidson and H. L. Sherwood, incorporators.

Gold Dirt.—This well known property at Perigo has been taken under a lease by Messrs. Lightbourn, Jenkins & Company, who will put it in shape at once.

Hill-Notaway.—A. J. Vivian of Denver has taken a lease and bond on this promising property in Russell District.

Mayflower.—F. Mueller has taken a lease on this Russell property and intends putting up a plant of machinery.

New York Mill Company.—Directors for 1899 are F. C. Came, J. F. Hopkins, A. B. Seaman, T. H. Williams and W. H. Coffin, and the officers are F. C. Came, president and general manager; J. F. Hopkins, secretary and treasurer, and A. B. Seaman, vice-president.

Sleepy Hollow Mining Company.—This company's property, near Black Hawk, was sold at Sheriff's sale to A. B. Seaman, of Denver, for \$15,054, the sale being effected to secure a judgment.

U. P. R.—Carbis & Co. have taken a 5 years' lease on this lode, in Gregory District, and a shaft house and plant have been installed. There is a good crevice of mill ore in the levels, and when shipments begin the daily output will be about 15 tons.

Hinsdale County.

Golden Fleece.—This mine is reported again in bonanza. The ore up to 2 years ago was phenomenally rich, but the shoot was lost, and since then the company has been developing its large body of low-grade ore. In doing this another body of high-grade ore has been opened.

Lake County.

(From Our Special Correspondent.)

Storms and the Ore Output.—The big snowstorm still continues, and has proved a serious blow to the camp. Never in the history of the State has there been such a snowfall, and this district is suffering with the rest of Colorado camps. The Ibox, the Resurrection and other mines, with a total tonnage of nearly 1,000 tons daily, have now been closed nearly 2 weeks, with the exception of pumping. Coal has to be hauled in sleds. Besides the coal shortage, there is a lack of mining timbers, and development work will be greatly hampered for the next 60 days.

The coal famine, the first ever experienced at Leadville, has caused the greatest anxiety, and for a time it seemed as if the pumps would surely have to stop.

When it was found last week that there was scarcely enough coal to keep the pumps going 24 hours, a meeting of the mine and smelter managers and business men was called. The mine managers tendered the service of 900 of their workmen to the railroads, and the men went to work under the direction of Geo. W. Cook, the Western agent of the Illinois Steel Company, and who was assisted by Messrs. J. W. Newell, of the Northern Mining Company; G. B. Lee, of the Arkansas Valley Smelting Company; S. D. Nicholson, of the Mab Mining Company; W. H. Nutting, of the Bimetallic Smelting Company; Ed. McCarthy, of the Excelsior Iron Works, and others. They succeeded in cutting the snow and ice to the blockade of 250 cars on the Rio Grande, and the same work will be done for the Midland Railway. This enables these roads to bring in coal and coke for a week's supply.

The effects of this storm will be felt some time in outlying districts. It will also be necessary for many of the mines to reduce hoisting for a time until all danger of a coal famine is passed.

Word from a number of mining camps surrounding this section shows a worse condition of affairs. At Aspen nearly all the miners are laid off, with barely any coal on hand and the roads tightly blocked. On the South Park line, around Kokomo and Robinson, all of the mines have stopped and the railroads are blocked by snowslides. At both these camps the pumping plants are out of coal, but men are cutting and hauling trees for fuel. From all sections

of Colorado the reports come that the storm is the worst ever experienced.

Gambetta.—Small shipments are being made from the ore body opened up at 233 ft. in one of the levels. The ore runs 50 per cent. lead and 8 to 15 oz. silver; and the drift is being run. The Gambetta is on Fryer Hill, and is operated by lessees.

Yak Mining, Milling and Tunnel Company.—Work is progressing very satisfactorily, and the tunnel is now in over 7,000 ft., piercing the eastern end of the Ravena claim, on Breece Hill.

FLORIDA.

Peace River Phosphate Mining Company.—At the annual meeting, in Savannah, Ga., the old board of directors, with one exception, was re-elected. The directors for the ensuing year are Messrs. H. M. Comer, Savannah; George W. Scott, Atlanta; C. Downing, Brunswick; J. T. Wilson, Montreal, Canada, and Joseph Hall, Savannah. At a subsequent meeting of the directors Joseph Hall was elected president; C. Downing, treasurer, and Robert Cope, assistant treasurer and secretary.

Citrus County.

John W. Pearson, manager Alta Mine, is erecting a phosphate plant near Cordeal, with 50 tons of clean rock per day capacity; cost of plant, \$9,000; number of employees, 40.

Dunellen Phosphate Company.—The company is building a \$12,000 plant near Rockwell, with a capacity of 50 tons daily. About 75 hands will be employed. J. J. Inglis is president of the company.

GEORGIA.

Kaolin Deposits.—It is stated that J. B. Van Buren, of Griswoldville, has leased to a New York syndicate with a capital of \$250,000 his kaolin lands, near Griswoldville, 12 miles from Macon. The syndicate proposes to begin work soon, manufacturing crockery and earthenware from these deposits of kaolin, which is said to be of the finest quality.

IDAHO.

Boise County.

Hi Yu.—High grade ore, 2½ ft. thick, is reported opened in this claim at Florence at 75 ft. below the first level. The shaft is to be sunk to a depth of 300 ft.

Twin Sisters.—This claim near Centreville, on which is a 5-stamp mill, has been bonded by Pittsburg, Pa., parties, who are interested in the Trade Dollar. A number of men are at work.

Idaho County.

Jennings Bar.—Buffalo people have purchased this placer ground on Snake River. The hydraulic system will be used, the water being taken from the Blue Lakes. It is estimated that the ground may run about 50c., with some pockets of richer sand.

Josephine Placer Company.—This company has been incorporated with a capital stock of \$100,000, to work 500 acres of placer land lying along the Middle Boise River. The following are the directors for the coming year: F. R. Reed, president; Joseph Shaw, vice-president; S. E. Burnham, secretary; E. K. McKenzie, treasurer, and W. R. Lindsey, superintendent. Principal offices are at Boise.

Owyhee County.

De Lamar Mining Company.—The report for December states that during the month 4,204 tons of ore were treated at the mill, assaying \$11.47 gold and \$1.06 silver, while the tailings assayed \$3.10 gold, 72c. silver. The gold bullion amounted to \$34,305 and the silver to \$1,107. The total product was \$37,605; expenses, \$32,635; profit, \$4,970.

Shoshone County.

The cold and stormy weather that has prevailed all over the West has shut down mills and concentrators, but development work has gone on at many claims and mines.

Barton.—This silver-lead property, near Murray, has shipped another car of ore.

Hummingbird.—A strike of 3 ft. of carbonate ore is reported in this group of seven claims near Burke.

Springfield Gold and Copper Mining Company.—This company at Wallace has let a contract to run a tunnel 200 ft. on its Stevens' Peak property.

Winnie.—Lumber for a 5-stamp mill for this group at Wallace is on the ground. The mill will be erected in the spring.

Washington County.

Great Vale.—This copper claim in the Seven Devils District near Cuprum has been bonded to J. Wharton, who has had charge of the South Peacock property.

INDIAN TERRITORY.

Coal Land Leases.—L. C. Burris, coal trustee for the Chickasaw Nation; N. B. Ainsworth, representing the Choctaw Nation, and D. M. Wisdom, of Muscogee, representing the Government, have made 27 leases, covering 25,520 acres

of coal lands in the Choctaw Nation, to F. W. Bond, representing the Fort Smith & Guthrie Railroad Company.

LOUISIANA.

Iberia County.

Avery Rock Salt Mining Company.—The company is sinking a new shaft at the Avery Island salt mine, which is to be 500 or 600 ft. deep. The shaft is now down about 100 ft. deep. The company's headquarters are in New York City. The officers are: E. F. Miller, president; H. D. Fuller, secretary; C. R. Scott, W. B. Putney and M. M. Belding, Jr., directors.

MARYLAND.

Frederick County.

An old copper mine, near Liberty, which has not been worked for a number of years, has been sold to a company of six New Yorkers. The new company has a force of men at work pumping out the shafts, and it is reported that a number of miners will be put to work in the spring. Several carloads of ore, which had been taken out before previous operations ceased, have been shipped away.

MICHIGAN.

Copper.

Mass Consolidated.—Bids have been asked for machinery, and when installed No. 3 shaft, on the Ridge property, 700 ft. deep, will be unwatered. T. F. Cole is superintendent. The mine is near Rockland.

Michigan.—This company has elected the following officers: President, John Stanton; vice-president, Joseph E. Gay; treasurer, John R. Stanton, and secretary, J. Wheeler Hardley. These men and Albert M. Low comprise the board of directors. The mine, near Hancock, is employing 50 men at present. A shaft is down 140 ft., and is being enlarged to 3 compartments. B shaft is down 220 ft., on the "Calico" lode, and drifting is to begin soon. Samuel Brady is superintendent.

St. Mary's Copper Company.—The stockholder to sell all the real estate of the corporation and divide the net proceeds among the stockholders. The price at which the sale is made is \$120,000, and the purchaser is C. H. Dickey, of Baltimore. It is reported that the debts and expenses of the company are nominal. The stock consists of 40,000 shares. The property consists of about 800 acres of copper land.

Tamarack.—At No. 2 shaft of this mine, near Calumet, 460 skiploads of rock were recently hoisted in a 10-hour shift, the shaft being 4,500 ft. deep.

Wahnita Copper Mining Company.—This company has been incorporated under the laws of New Jersey, with \$1,000,000 capital, by F. H. Clark, J. H. Fuller and H. F. Whitney. Bids have been asked for machinery. A 10-drill compressor plant is to be put in at once, it is said. The property covers several hundred acres, the principal vein being amygdaloid. Capt. Wealton, who opened up the Osceola lode, is to act as superintendent.

Iron—Gogebic Range.

Tilden.—This mine, at Ironwood, is hoisting ore from 4 shafts and will probably have 200,000 tons on hand when navigation opens.

Colby.—This mine, at Bessemer, is working one shaft and exploring with a diamond drill.

Iron—Marquette Range.

It is stated that the managers of the mines about Ishpeming have decided to advance wages 10% by February 1st.

Barasa.—This mine, which has been under development nearly 5 years, is now opening up the ore body found by a diamond drill hole several months ago. The South Shore road has a spur to the mine, and a stock pile of respectable size will be on hand when navigation opens. The opening of the deposit has been slow work, as much time and money were spent in an attempt to sink a shaft through a bad quicksand.

Messrs. Barasa and Marketti are the owners of the fee, and the company which is conducting the operations has as officers: J. F. Mack of Marquette, president; B. W. Wright of Ishpeming, secretary and treasurer. F. O. Clark and Fred Bending of Marquette and George P. Black of Pittsburg, in addition to the officers, compose the board of directors.

Negaunee.—This mine, at Negaunee, is exploring the ore body recently opened. The ore by care in mining can be shipped as Bessemer.

Queen.—This Negaunee mine, owned by Corrigan & McKinney, of Cleveland, has been bought by the Oliver Mining Company.

The Queen group comprises the Queen, Prince of Wales, Buffalo and Blue mines. The mines have been worked but intermittently since 1892.

Iron—Menominee Range.

Aragon.—This mine, at Norway, belonging to the Commonwealth Iron Company, is to be equipped with a large Worthington pump at No. 2 shaft, where water is troublesome. At

No. 4 shaft a new engine house is under way, and the hoist at No. 3 is to be moved there.

Pewabic.—At this Iron Mountain mine the Walpole shaft is being sunk another lift. About 300 men are employed.

MINNESOTA.

(From Our Special Correspondent.)

The weather has been so severe the past week that all outdoor work was suspended. The mercury at Lake points was below its freezing point, and spirit thermometers were registering from 50 to 55° below zero. At the mining towns of the Minnesota ranges temperatures as low as 60 degrees were recorded, and the Government instruments at Pokegama dam, a few miles west from Hibbing, touched 63° minus. There is considerable snow in the woods, and this low temperature has probably not had very much effect in freezing the ground deeper. No such weather has been known in the Northwest for many years.

It is understood that the new National Steel Company, composed of steel works in the Ohio and Western Pennsylvania valleys, has control of the Oliver one-sixth interest in the mines of the Oliver Iron and Steel Company. So far as Minnesota is concerned, these mines include the Mountain Iron and Oliver, both stripping mines, the Norman, and the undeveloped Sheridan, on the Mesabi, and the Pioneer, Savoy and Zenith, as well as two or three optioned explorations on the Vermillion. The new company, through some of its constituents in the steel-making department, has also interests in the Biwabik and Mahoning mines, on the Mesabi. These are also stripping propositions, and with the two stripped properties of the Oliver company cover the finest properties on that range. The local Minnesota interests view this concentration of its best mines in the hands of one of the newer Eastern combinations with considerable distrust.

The Duluth & Iron Range road is expecting to carry at least 1,000,000 tons more ore the coming season than last. It is gradually replacing all 60 and 80-lb. steel on its main line with 100-lb. No. 1 dock is taken down to the water level and the framing timbers on the new work is well in hand.

It is not at all unlikely that the miners of this State, since the reported raise of copper wages by 10%, and the expected raise of a like amount at Ishpeming, will get better pay, though no demand has been made and probably will not be. The situation will probably force such a raise by the opening of spring.

The new dock No. 1 for the Duluth & Iron Range road, at Two Harbors, will take 6,000,000 ft. of timber, of which 2,000,000 is long stuff from Washington, oak and maple. The remainder is pine. In addition, some thousands of piles must be driven, averaging 50 ft. long. The end of the dock will be in 40 ft. of water, and its floor is to be 99.5 ft. above the top of the foundation.

The dock is to be ready by May 1st. It will give the road the following facilities for shipping:

Dock No.	Height above water, ft.	Length, ft.	No. Pockets.	Tons storage capacity.	Built.
1	33.5	1,350	200	40,000	1890
2	37	1,250	208	42,000	1898
3	51.5	540	90	16,000	1893
4	51.5	1,080	168	30,000	1894
5	54	1,080	168	30,000	1896

This gives the company a total storage capacity for 158,000 gross tons, and with its admirable system of vessel transportation will enable it to handle from 3,600,000 to 4,000,000 tons of ore in one season.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Commodore Mining Company.—This mine is being unwatered. It has sold its output for the current year. Like the Franklin, it is at Virginia, and the only work going on there is at these two mines. A new lease to the Commodore company direct has been made, straightening out the tangle of lessees' interests.

Franklin Mining Company.—This company has resumed work under Capt. Ed. Parmalee, who had charge of Corrigan interests on old ranges. It is understood that most of the output is sold, and that the mine is operated under some arrangement in which the Rockefeller Company is concerned. A week ago a suit was brought against the company by W. C. Yawkey, fee holder, for back royalties on the Bessemer part of the mine. This has been withdrawn, and it is said that the matter has been adjusted.

Iron—Vermilion Range.

(From Our Special Correspondent.)

Oliver Iron Mining Company.—At the Pioneer, near Ely, a machine shop and foundry is being equipped with tools of the most approved makes. Air for both the Savoy and Zenith mines is supplied from the Pioneer, and is piped about 1 1/2 miles to Savoy. At Pioneer some 400 men are working, and 1,200 tons of ore are being hoisted

daily. Prospecting is still carried on in options just east from Savoy, and the results are said to be very favorable. A large Cahall water tube boiler is in place at Pioneer. A telephone line connects the 3 mines, and they are operated as one. At Zenith and Savoy, some 150 men are employed on development. A laboratory is being fitted up at Zenith for ore from the 3 mines. Zenith's main shaft is being sunk another level; it was already down 750 ft.

MISSOURI.

Jasper Country.

(From Our Special Correspondent.)

Joplin Ore Markets.—The week ending February 11th was the most severe ever known in this district, the mercury remaining below zero for the greater part of the week. In consequence 9 out of every 10 mills in the district have shut down until the weather becomes milder. The output was cut down over two-thirds, and a great part of the ore sold was frozen in the bins and could not be loaded. No bids were made by the buyers for ore until Thursday morning, February 9th. The top price was \$45 per ton for jack, the highest price ever paid in the district, and an advance of \$6.50 per ton over the previous week; but the bulk of the sales were made at from \$43 to \$44 per ton. Lead opened the week at \$27 per 1,000, the same as last week; but it declined to \$26 per 1,000 on Thursday, and closed the week at this figure. During the corresponding week last year jack sold at \$22.50 and lead at \$21.75, and the turn-in was greater than for the past week by 3,894,090 lbs. of zinc and 773,290 lbs. of lead; but the value, owing to the lower prices prevailing last year, was only \$14,050 more than that of last week. The shipments for the first 6 weeks of last year fell short of the output this year to the extent of 6,293,860 lbs. of zinc, but the lead shipments were greater by 2,170,253 lbs., the value being less by \$303,953. As compared with the previous week, the output fell off by 2,314,910 lbs. of zinc and 327,310 lbs. of lead, and the value was less by \$32,229.

Following are the sales of lead and zinc ore from the various camps in the Joplin district for the week ending February 11th: Joplin, zinc, 1,111,570 lbs.; lead, 90,280 lbs.; value, \$26,636. Webb City, zinc, 171,430 lbs.; lead, 9,420 lbs.; value, \$3,854. Cartersville, zinc, 333,860 lbs.; lead, 54,280 lbs.; value, \$8,477. Oranogo, zinc, 630,480 lbs.; lead, 28,210 lbs.; value, \$14,349. Duenweg, zinc, 143,170 lbs.; value, \$1,701. Central City, zinc, 207,400 lbs.; value, \$4,355. Galena-Empire, zinc, 832,600 lbs.; lead, 299,330 lbs.; value, \$24,734. Stotts City, zinc, 82,590 lbs.; value, \$1,817. Carthage, zinc, 110,000 lbs.; value, \$2,475. Aurora, zinc, 200,000 lbs.; lead, 20,000 lbs.; value, \$3,150. Belleville, zinc, 122,030 lbs.; value, \$2,685. District total for week, zinc, 3,945,130 lbs.; lead, 501,520 lbs.; value, \$93,933. District total for 6 weeks, zinc, 53,882,510 lbs.; lead, 501,520 lbs.; value, \$949,045.

Leases have been recorded in the past week on 534 acres of land in the Joplin District for mining purposes. This includes only large tracts, no record being kept of the leases of mining lots, except on the books of the company owning the first lease.

The "Betsy Jane" mill at Aurora, owned by T. J. Liles, was totally destroyed by fire on Saturday night. The plant was the oldest at Aurora, and will be replaced with a modern plant as soon as the weather will permit the work of building to commence.

J. Carmichael has sold his quarter interest in the Naulakah mine, on the Empire ground, at Joplin, to J. Mannen, of Galena, for \$1,500. The other owners refused \$2,500 per quarter for their holdings, and the company will build a mill with all possible speed.

Sheriff O. L. Sparks, of Cherokee County, Kan., has let the contract for a 125-ton mill on his lots on the East Galena ground, at Galena.

Elk Lead and Zinc Mining Company.—Two new mills are going up on the company's 80-acre lease at Webb City, to handle the dirt from 5 shafts.

Henry C. Butcher Mining Company.—This company, composed of Philadelphia men, is building a mill on its 40-acre lease of the North Joplin ground.

Ishpeming Mining Company.—This company, at Carl Junction, composed of Michigan capitalists, is draining its ground to a depth of 300 ft. with an air lift pump, the first in this district. The system was put in as an experiment, and is completely successful. It throws a 6 1/2-in. stream of water and drains the ground at much less expense than with ordinary pumps, the company claims.

Jones & Doan.—These parties are building a 100-ton mill on a 20-acre lease of the old Block City land, 1 mile south of Belleville.

Little Pete.—G. W. Armstrong, of Roodhouse, Ill., has purchased a third interest in the mine on the Bailey and Stickney lease east of Joplin.

O'Neal & Company.—These parties, on the Chatham grounds, at Cartersville, have let a contract for a 125-ton mill to be completed March 15th.

Poundstone Land.—A drill hole on this land, 4 miles northwest of Oronogo, has shown up 121 ft. of solid pebble jack, the greatest strike ever heard of in the district.

Vernon Mill.—This mill, on the Troup land, at Prosperity, belonging to Col. Thomas J. Steers, of Joplin, was burned to the ground on the night of Thursday, February 9th, the loss being \$8,500, with an insurance of only \$2,000. The mill was turning out 50 or 60 tons of jack per week, which sold last week at \$42 per ton.

MONTANA.

Beaverhead County.

Eclipse.—This mine at Winston, producing 3 or 4 tons of good ore daily from a 14-in. vein, recently opened.

Leslie Copper Mining Company.—This has been organized in Wallace with the following officers: W. W. Woods, president; Chas. E. Burns, vice-president; L. P. Larson, secretary and treasurer; Wesley Everett, manager. The capital stock is divided into 1,000,000 shares of \$1 each. It is to develop a group of claims just over the Bitter Root summit, on the Montana side in the same gold-copper belt as the Richmond, St. Lawrence and Stevens Peak properties. Mr. Everett has run several hundred feet of tunnel and shown up some good ore in limited quantities. Work will begin as soon as the snow is out of the way.

Cascade County.

Moulton.—This company at Barker owns four claims in one group, consisting of the Harrison, Belfont, Pioneer and Moulton. A tunnel 1,232 ft. long has been completed on the Moulton, attaining a depth of 356 ft. below the surface. This tunnel is mostly in hard rock, but partly in ground so soft as to make progress difficult. The tunnel was run to tap a vein on the Moulton which has been opened from the surface by a shaft 100 ft. deep. This vein was last summer under lease by the United Smelting and Refining Company of Great Falls, and over 3,000 tons of ore were extracted.

Queen of the Hills.—About 25 men are employed at this mine near Barker, under Superintendent Nelson. The stopes have been brought through from the 300 to the 100-ft. level. Shipments averaged in 1898 about 5 or 6 cars of ore per month. A strike of rich ore, 18 in. wide, is reported in the south drift at the 300 level. The strike is in a vein leading toward the Bonner, although it is 100 ft. north of and 250 ft. below the Bonner workings.

United States & British Columbia Mining Company.—This company has an option on the Buzz Saw group, near Libby, and is to begin development work soon. J. M. Dikeman examined the property. The plan of development is to drift north on the Buzz Saw vein from No. 2 tunnel into the Kootenai claim, farther up the hill and on the same vein. This work will begin at a depth of some 300 ft. and will gain depth rapidly. The company is carrying on mining operations in nearly all the Western mining States and in British Columbia and Mexico. Its general offices are in Kansas City and the officers are: President, Arthur E. Stillwell; vice-president, S. J. Cairnes; secretary, Arthur C. Robinson; treasurer, C. A. Braley; assistant treasurer, Frank B. Wilcox; general manager and consulting engineer, Arthur Winslow.

Wright & Edwards.—At this Barker mine about 14 men are working at present. The shaft has been sunk to a depth of 317 ft., and at the 300-ft. a crosscut to the ledge is begun. The mine is under lease to the Great Falls Smelter.

Fergus County.

Great Northern Mining and Development Company.—The material for the new cyanide mill is mostly on the ground at Gilt Edge.

The tank floor will be 32x180 ft.; machinery building and engine room, 56x84 ft.; zinc and cutting down room, 32x44 ft.; solution room, 16x30 ft.; main ore bin, 19x33 ft., 26 ft. high and ground ore bin capacity of 100 tons.

There will be 6 leaching tanks, each 28 ft. in diameter and 3 ft. high, made of ¼-in. steel; 2 solution tanks 12 ft. in diameter and 4 ft. high; one sump tank 14 ft. in diameter and 4 ft. high; one water tank 20 ft. in diameter and 12 ft. high. The motive power will be furnished by a 125 h. p. Corliss engine and two 65 h. p. boilers. A 3-drill Rand air compressor will be used in the mine and electric lights in both mill and mine.

The ore will be conveyed in the car to the large ore bin, where a belt conveyor will carry it to a No. 5 Gates rock breaker and thence to the Allis ore dryer. From thence the ore will be elevated to screens and all that goes through will be again elevated to the ground ore bin over the tanks. What does not go through the screen will be discharged into 2 Gates rolls, and from thence carried back to the screens again. Only one man will be required to handle the ore from the bin until it has reached the ground bin over the tanks.

The leaching tanks will be filled by a 2-ton car driven by a wire cable. After the ore has been leached the tailings will be dropped through an opening in the center of the tank and run out on the dump by an endless rope.

The intention of this company is to drive a tunnel through the Chickadee mine about 1,200 ft. and bring all the ore from the Peerless, Storm King and other mines on the other side of the hill through this tunnel to the mill. A. R. Ledoux of New York, is the president of the company, and E. W. King general manager.

Flathead County.

Montana Kootenai Gold Mining Company.—This company, capital stock, \$500,000 in \$1 shares, proposes to develop the Way-Up and Montana lode claims, on Goat Mountain, near West Fisher Creek, about 40 miles southwest of Libby Creek station of the Great Northern Railroad. The vein is said to be in a contact between slate and quartzite, and to be 20 ft. thick. The ore is iron pyrites carrying gold. Over 200 ft. of development work is reported done on the property. The officers of the company are: President, A. H. Melin; vice-president, James Finlen; secretary and treasurer, H. A. Galloway. The principal office is in Butte.

Jefferson County.

Katie.—The shaft of this mine at Basin is down 400 ft.

Basin Gold and Copper Mining Company.—Chas. H. Dickie of Baltimore has secured an option on the Hope Mine at Basin through Manager M. A. Hewitt.

NEVADA.

Eko County.

(From Our Special Correspondent.)

South Dexter Mining and Milling Company.—A Utah corporation whose articles were filed with the Secretary of State of Salt Lake City on January 11th. Capitalization, \$25,000, in shares of 10c., with 50,000 shares devoted to treasury needs; stock is assessable. The mineral holdings are the Christmas and Gift lode claims in the Tuscarora mining district. The principal office is at Salt Lake City, and the officers and directors are: R. G. Wilson, president; Phil Sullivan, vice-president; C. E. Hudson, secretary-treasurer; H. Barnett, all of Salt Lake City, and H. Parker, of Tuscarora.

Humboldt County.

(From Our Special Correspondent.)

Gold Hill Mining Company.—This is a Utah company. Articles of incorporation were filed at Salt Lake City on January 10th. Capitalization, \$200,000; shares \$1. Principal office, Salt Lake City; annual meeting, first Monday in May. Officers and directors are: C. B. Pfoutz, president; C. K. McCormick, vice-president; DeWitt B. Lowe, secretary; E. D. R. Thompson; all of Salt Lake City, and George S. Nixon of Winnemucca, Nev., treasurer. Realty consists of Gold Hill, Gold Coin and Gold Note quartz lode mining claims.

White Pine County.

(From Our Special Correspondent.)

Boston-Nevada Mining Company.—A Utah company. Articles of incorporation were filed at Salt Lake City, on January 12th. Capitalization, \$25,000, in shares of 10c., with 33,000 shares set apart for treasury needs. The principal office is at Salt Lake City. Annual meeting on the second Monday in July. The mineral ground is composed of the Bryan, Comet and Dorsie lode claims in the Schell District. The officers and directors are: Henry Siegel, president; Abe Hanauer, vice-president; J. H. Siegel, secretary-treasurer; S. Siegel, all of Salt Lake City, and S. Davis of Aurum, Nev.

NORTH CAROLINA.

Cabarrus County.

(From Our Special Correspondent.)

Nugget.—Some beautiful gold nuggets and rich quartz are being found at this mine by tributaries.

Union.—This old gold and copper mine is about to resume work. It has been bought by Walter Newman, of New York, and associate, who have made one payment and gone to work with 25 or 30 hands. This mine adjoins the Gold Hill Mines, and is on the same vein. Before the war it produced copper ore that was hauled to Salisbury, and shipped thence by rail to Baltimore. It is thought that most of the ore, a sulphide, will run 5 per cent. in copper, with some gold and silver.

OHIO.

Harrison County.

Scio Oil Field.—There are now 78 producing wells in the district, though a number have shut down, owing to recent storms and cold weather. The daily production is estimated at 2,615 bbls.

Licking County.

Clay City Gas and Oil Company.—A seam of coal 7 ft. thick is reported on land under option to this company, northeast of Newark.

PENNSYLVANIA.

Anthracite Coal.

Lehigh Valley Coal Company.—York Farm Colliery, at Pottsville, has closed down, and is being dismantled, throwing out of employment 300 men and boys. The colliery was opened

seven years ago, and according to reports has not paid.

Philadelphia & Reading Coal and Iron Company.—This company is reported to contemplate filling its abandoned workings beneath Mahanoy City with culm from the banks at Schuylkill and Glenwood Collieries.

Sweeney & Christ.—These parties have closed down indefinitely the Rosebud Colliery, in the northern part of Tamaqua.

Slate.

(From Our Special Correspondent.)

Damages by Frost.—Tons of slate rock in beds exposed to the frigid weather of the past week have been frozen, entailing thousands of dollars of damage to quarries. The percentage of loss is twice that of previous winters for several years past.

Bangor Roofing Slate Manufacturers' Association.—This body will convene again February 21st, to formulate a price list. Last week it abandoned the proposed limiting of the output, not being able to agree on the apportionment. Indications are unfavorable to an agreement.

Eureka.—Projected production in 1899 of this quarry, 15,000 squares roofing slate, all of which is to be taken by James L. Foote, general manager of the Slatington-Bangor Slate Syndicate.

Old Bangor Slate Company.—The quarry, the largest in the region, officials say, will resume operations on or about April 1st. Through a strike, it has been idle since September 5th, 1898. The difficulty is expected to be solved by offering unlimited employment at the current wage. No change was made in officers or management at the annual meeting.

Pen Argyl Valley.—All boilers have been reset and walled in since shutting down January 1st. With other improvements made, this quarry has a steam plant unexcelled in the region with which to resume next month.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Willow Creek Mining Company.—This company, of Lemars, Ia., own the Lizzie Mine. At a depth of about 250 ft. a flat formation was encountered, which resembles that of the Bald Mountain District. A steam hoist has been put in and the company is planning to build a mill. The mine is just west of Custer, and there are about 20 claims in the group. This is the first genuine discovery of silicious ore in the county.

Lawrence County.

(From Our Special Correspondent.)

Black Hills Forest Reserve.—Forest Supervisor Hamaker, of the Black Hills Reserve, misinterpreted the order allowing the dead and fallen timber of the reserve to be chopped into cord wood free of stumpage cost, and a large amount of this has been cut. The Supervisor has received an order from the Interior Department prohibiting all cutting of timber, dead or green, until further notice.

Cold Weather and Storms.—Owing to the severe cold of the past 3 weeks, nearly all of the streams in the Northern Hills are frozen solid. The Homestake Company has been compelled to hang up over half of its stamps from lack of water, and many mills have either closed down entirely or are running on part time. The Spearfish and Garden City cyanide plants have closed down and the mills and smelters in Deadwood are short of ore, as ore trains cannot get to some of the producing mines. The storm began 3 weeks ago, and the thermometer has been below zero continuously since, while several days it registered 36 to 40° below. The narrow gauge roads to the Bald Mountain mines are badly blockaded. The spur to Portland and Crown Hill has been closed 3 weeks, and all the mines in those districts have closed. All surface prospecting has been discontinued, because of the deep snow, which at Ragged Top and surrounding high districts is 4 to 5 ft. deep. It has been the coldest spell of weather ever known in the Hills.

Baltimore & Deadwood.—The steel rails and 2 cars have arrived at Deadwood for the tramway, 1,000 ft. long, from the mine to the new mill. J. H. James and Theodore Gross, of Chicago, are looking after the company's business. All of the machinery is in place in the mill.

Homestake Gold Mining Company.—The Old Star hoist is being torn down, the hoisting being done in the Highland and the Deadwood-Terra. The machinery from the Old Star is being taken out and put in the new hoisting building, near by. Two months will be required for this. The company uses several thousand gallons of mineral paint each year about its buildings. The master painter of the company has discovered a mixture that is easily made and is said to be superior to the article formerly obtained from St. Louis. A plant has been built near the mills with a capacity for 100 gals. per day, and the company will supply its own paint.

Phantom.—On this group of claims, owned by Edwin Van Cise and associates, of Deadwood,

work has been suspended for 2 months. A shaft is down 300 ft. and a drift run some distance. Work will be resumed soon.

Sundance.—It is announced that the Golden Reward Company will start up this mine, located a half mile from the Tornado. The two mines are to be connected and the pumps in the Sundance will be used to drain the Tornado.

Pennington County.

(From Our Special Correspondent.)

New Enterprises.—The success of the Holy Terror-Sunnyside mines in striking ore after penetrating a barren streak of rock at about the 100-ft. level has started a number of mines sinking deeper. There are about 20 old shafts around Hill City, among the more promising being the J. R. Golden Slipper, Climax, New Eldorado, Columbia, which lie between Hill City and Keystone, and the Lena, Crane, Schnee-Piper, Waldo and several new discoveries on Burnt Fork, Friday Gulch and Newton's Fork, north of Hill City. The 10-stamp mill on the St. Elmo is running steadily and ore is being taken out of the Grizzly Bear, south of Hill City.

Hill City District.—It is estimated that between \$12,000 and \$14,000 are paid monthly to the miners in this district. The taxes are kept up on the property of the Harney Peak Tin Company; considerable spodumene has been shipped from the Etta, and several thousand cords of wood are being cut by the company on its patented ground. The St. Elmo stamp mill is running steadily on ore.

Keystone District.—Ike Humphrey and Ed Stenger have purchased the wealthy group of claims northwest of Keystone, on the Keystone belt. There are 10 claims and a 10-stamp mill. John Jones, of Iron Mountain, Mich., is negotiating for the Ingram stamp mill, at Keystone, to treat the free-milling ore from the Lucky Boy and associate claims, across the gulch from the Holy Terror mine. R. M. Maloney, of Deadwood, has closed the deal for the 5 claims west of the Holy Terror.

Woodville District.—Considerable activity exists in this free-milling district, on Elk Creek. On the old dump of the Scandinavian Mine, now called the Guano, owned by J. T. Myers and associates, considerable ore is piled up assaying from \$5 to \$10 a ton. A 10-ft. ledge of ore has been opened up.

TENNESSEE.

Hickman County.

Meridian Phosphate Company.—This company, of Meridian, Miss., is opening a new phosphate mine near Centerville. Thousands of acres of land in that section have been optioned. It is stated that a fertilizer plant will be erected near Centerville, and that a railroad will be built up Swan Creek from that place.

Polk County.

Ducktown Sulphur Company.—The Watts Steel and Iron Syndicate, of Middlesborough, has purchased the property of this and the London Coal and Iron Company, at Ducktown, and will double the operating force and ship 25 carloads of iron ore per day instead of 10, as heretofore.

Pittsburg & Tennessee Copper Company.—This company, at Ducktown, is shipping about 2 cars of copper metal a week. Hugh Ferguson, receiver of the company, is managing operations.

UTAH.

Juab County.

(From Our Special Correspondent.)

Garnet Mining Company.—Capitalization, \$125,000; shares 50c., with 50,000 shares for treasury needs. Principal office, Salt Lake City; annual meeting first Monday in December. Officers and directors are:—George Whittaker, president; W. B. Barton, vice president; James Whittaker, treasurer; R. G. Smith, secretary; T. Ellis-Browne, all of Salt Lake City. Realty consists of Home Rule, Garnet and Guardian lode claims, situate in Tintic mining district.

Lulah Consolidated Mining Company.—Capitalization \$30,000, in 10c. shares, with 100,000 shares set apart for treasury purposes. Officers and directors: A. J. Weber, of Ogden, president; J. T. Hodson, vice president; W. P. Lynn, secretary-treasurer; G. W. Heintz, all of Salt Lake City; J. S. Page, of Payson. Realty consists of Mildred, Lulah and Silver Democrat lode claims, situate northeast of Diamond, near Joe Bowers.

Silver Hill Mining Company.—Capitalization \$150,000; shares 50c., with 100,000 shares set aside for treasury needs. Principal office is at Salt Lake City; annual meeting first Tuesday in April. Officers and directors are: C. V. Wheeler, president; John Leyshon, vice president, both of Silver City; J. T. Croxall, secretary-treasurer, of Salt Lake City, and J. M. Wheeler, of Silver City. Realty consists of Silver Bell and Silver Bell No. 2, situate east of the Kingsley and ¼ mile north of Silver City.

Tooele County.

Circle Gold Mining Company.—Incorporation articles were filed with the Secretary of State on December 28th. Capitalization, \$75,000, in shares of 25 cents each, with 50,000 shares set aside for treasury purposes. Principal office is at St. Lake City; annual meeting second Monday in January. Officers and directors are E. H. Airis, president; E. D. Woodruff, vice-president; George Weston, general manager; George Airis, secretary-treasurer; R. G. Legg. Mr. Weston resides at Ophir, Mr. Legg at Mercur, the others at Salt Lake City. Realty consists of Circle, Circle No. 2, Mint, Rand, Bryan, London and London No. 2 lode claims near Ophir.

Wasatch County.

(From Our Special Correspondent.)

Superior Consolidated Mining Company.—Incorporation articles were filed with the secretary of state on January 10th. Capitalization, \$40,000, in shares of 10 cents, with 50,000 shares set apart for treasury needs. Principal office is at Park City. Annual meeting second Monday in May. Officers and directors are: E. P. Le Compte, president; F. M. Smith, vice-president; H. W. Hinman, secretary-treasurer; W. W. Rose, H. G. Bates, all of Park City. Realty consists of Morning Star No. 2, Red Bird, Red Horse, Lake View No. 2, Reward, Homestead, Black Rock, Monument Rock, Meadow, Grey King, Autumn Gold and an undivided 2-3 interest in Clipper and Missing Link lode claims, all situate in Blue Ledge mining district.

VERMONT.

Slate.

(From Our Special Correspondent.)

J. L. Presswell, a slate dealer of Toledo, O., has bought a half interest in the M. J. Jones quarry, situated in the south part of the town of Poultney.

Sea Green Pool.—Several sea green slate manufactures of Poultney, including Edwards & Williams, Jones & Owens, Jones & Roberts, Roberts & Edwards, Parry & Jones, Thomas & Williams and Jones & Morris, have associated themselves together for the production and sale of sea green slate. It is claimed that the slate produced will be the best quality of sea green and will average about 5,000 squares per month. The following officers were elected: President, C. W. Parry; vice-president, E. O. Roberts; treasurer, B. R. Jones. R. R. Williams, R. H. Roberts and William Hughes, recently with Griffith & Nathaniel, will travel for the association.

Jones & Owens.—This firm lately placed a 40 H. P. engine and boiler at its quarry at South Poultney.

VIRGINIA.

Culpeper County.

Powhatan.—This gold mine has been purchased by Capt. Johnson of Orange for a reported price of \$40,000. The mine is to be worked again.

The transfer has been approved by the United States Circuit Court. The sale embraces 1,000 acres of land and the machinery of the mines. The mines have been closed 5 years because of litigation.

Louisa County.

Arminius Chemical Company.—The improvements in the machinery, etc., have nearly been completed, and the company is now about to produce 70,000 tons of pyrites per annum. The amount is to be increased by April 1st through further additions to the plant, to 100,000 tons per annum. So far in 1899 trade has been very satisfactory.

WASHINGTON.

Okanogan County.

Okanogan Free Gold Mines, Limited.—A complete plant is to be purchased for this property, consisting of 10 stamps, 2 Wilfley concentrators and a cyanide plant to work the tailings. The company will erect a small sawmill, with which to get out the necessary lumber for the mill and flume. The power for the mill will be furnished by a half-mile flume, which will bring water from the falls of the Similkameen River. The property is near Oro, in the northeastern part of the county. A. S. Edgecombe is manager.

Stevens County—Republic.

(From Our Special Correspondent.)

Georgie Reed.—This group consists of 4 claims, Georgie Reed, Bull Dog, the "S." and Mobile, upon 2 separate veins, lying above the south fork of the San Poil River, 12 miles south of Republic. The upper vein is 30 ft. wide and yields assays as high as \$248 per ton. It strikes through the Bull Dog and Georgie Reed claims and is opened by a crosscut tunnel to a depth of 60 ft., and 16 ft. of drifts. The south drift is within 20 ft. of the north line of the Bull Dog, and the breast is in quartz which has an average assay value of \$27 in gold per ton. This vein can be tapped by a tunnel at a depth of 1,200 ft., and a company is to be incorporated for the purpose.

Golden Lilly.—A new contract is let to continue the tunnel now in 85 ft.

Gold Leaf.—The tunnel is in 345 ft.

Good Luck Consolidated Gold Mining and Milling Company.—Work will begin immediately on the Good Luck and Golden Wave claims.

Jumbo.—Surface prospecting continues.

Little Giant.—This mine has recently been incorporated. The company will begin work by crosscutting and tunneling.

Maud S.—The vein is 10 ft. wide, of broken quartz and porphyry. A tunnel is under way to tap it 125 ft. deep at a distance of 250 ft.

Munroe.—The tunnel is in 75 ft. The breast is in hard ground, but shows small stringers of quartz. The first ledge will probably be cut about 25 ft. further in.

Reindeer.—The tunnel is in 80 ft., with 45 ft. further to run to cut the main ledge. The breast is in a mixture of quartz and porphyry that looks promising.

Republic Gold Mining and Milling Company.—The new 80 H. P. boiler is in place and the compressor and all the machinery at the mines and mill are running full time. The mill output in January exceeded that of December, and about 75 tons of ore were shipped to the smelters during the month. The additional Ball pulverizer is ready to start. The other two are making 24 revolutions per minute, in place of 16, as before. On the No. 3 tunnel level, the manager says there is 4 ft. of \$200 ore. The strike is reported as about 140 ft. north of the dividing line between the Republic and Jim Blaine. It is significant that pay ore having been struck on the hanging wall side on the No. 3 level, confirms the report in the "Engineering and Mining Journal" of November 12th, that the faulting of the vein on No. 2 level had thrown the pay shoot to the hanging wall. The raise from the No. 3 level has holed into the winze from No. 2 level. Stopping will start between the two lower levels and the main south drift will be extended into Jim Blaine ground. I learn that all the ore broken down the balance of the winter will be treated at the mill, and none will be shipped to smelters.

WEST VIRGINIA.

Petroleum Prospects.—In the lower Southwest Field development is very active. In the past 6 weeks more than 50 wells have been completed. The production has increased from about 150 bbls. a day at the close of December to more than 2,500 bbls. a day. Only 2 dusters have been encountered, and the producing wells have been very uniform. But one has been drilled that had a record of more than 100 bbls. a day. The average daily production of all the wells is close to 45 bbls. a day.

FOREIGN MINING NEWS.

AUSTRALASIA.

New Zealand.

The report of gold exports for the full year is as follows, by quarters:

	1897.	1898.
First	69,621	70,508
Second	60,046	66,562
Third	60,220	67,270
Fourth	61,757	75,836
Year, crude oz.	251,644	280,176
Year, fine oz.	230,782	254,444
Year, value	\$4,770,256	\$5,259,363

The increase in 1898 was 23,662 fine oz. (\$489,107), or 10.2 per cent. over 1897.

The "New Zealand Mines Record" says: "In the Mining Act amendment, 1896, it was provided that, on account of the difficulty experienced in procuring duly certified mine managers, it was deemed expedient to make temporary provision in that behalf by the issue of provisional warrants on the recommendation of the inspector; such warrants, unless canceled, to remain in force until January 1st, 1899, so long as the holder continued to be manager of the mine named in the provisional warrant. It was further provided that the inspector of mines should make a half-yearly inspection of every mine managed by a provisional mine manager, report to the Minister the result of such inspection, with special reference to the nature of the management and the capacity of the provisional manager; and that on or before November 15th, 1898, the inspector should make to the board of examiners a special report as to the capacity and fitness of every person who had acted as manager of a mine under a provisional warrant. Seventy-seven applications were sent in for certificates, and the board of examiners have been holding a special sitting in Wellington, making the necessary inquiry and examination as to the fitness of the various candidates. Altogether there were 285 provisional warrants issued, and 71 certificates have been granted by the board."

Queensland.

The gold production for the month of January is reported at 54,700 crude oz. Nearly all of this was from quartz mines.

Western Australia.

The gold production in January is reported at 110,090 crude oz., which compares with 93,395 oz. in 1898 and 40,384 oz. in 1897.

CANADA.

British Columbia—East Kootenay District.

(From Our Special Correspondent.)

Crow's Nest Pass Coal Company.—This company now has 60 coke ovens at work on its property, near Fort Steele.

British Columbia—Nelson.

Hull Mines, Limited.—This company reports for the four weeks ending January 27th that the smelter ran 22 days 6 hours. There were 2,727 tons ore melted, the yield being 69 tons copper and 39,250 oz. silver; showing an average of 2.53 per cent. copper and 14.4 oz. silver to the ton.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Center Star.—The vein recently uncovered along the grade of the Canadian Pacific Railway on Red Mountain is of greater extent than was at first reported. The ore body in some places is three to four feet wide, the ore bearing a strong resemblance to that of the War Eagle. The strike is northeast and southwest. The location is a few hundred feet below the old ore shoot of the Le Roi.

Evening Star.—The recent discovery was in the tunnel at a depth of 165 ft. Roy H. Clarke, the engineer in charge, says that the ore is of very fair grade.

Rossland Ore Shipments.—The ore shipments from Rossland mines for the week ending February 9th amounted to 1,050 tons, making a total of 5,950 tons from January 1st.

Nova Scotia—Cape Breton.

Drummond Colliery.—The shipments in 1898 were, by water, 96,060 tons; total production, 210,190 tons, of which 12,113 were used at the colliery.

General Mining Association of Sydney Mines.—Shipments for 1898 amounted to 230,679 tons. This amount with 13,036 tons, sold to local purchasers, gave a grand total of 243,615 tons as the sales for the year. The sinking of the new pit which reached the company's No. 3 seam at a depth of 468 ft. is being carried down to test the No. 4 seam which it is expected will be met at about 660 ft. from the surface.

Nova Scotia—Guysboro County.

Hurricane Point Gold Mining Company.—This company works what was known as the Palfren Mine at Isaac's Harbor. A shaft is down 160 ft. A 10 stamp mill is on the property. One lode is 14 to 24 in. wide, and another 7 to 10 in. The ore is reported to be high grade, and the gold produced is very pure. In 1898, 2,785 tons of quartz were produced, which returned 1,766½ oz. gold, valued at \$34,097. The cost of production was \$18,597, leaving a profit of \$15,500. George A. Pyke is president of the company and of the Richardson Mining Company that is working near by.

Nova Scotia—Hants County.

Standard Mining and Reduction Company.—This company has been incorporated under the laws of Maine by Worcester, Mass., people to work the MacNaughton mine at East Rawdon. The capital stock is \$500,000, and headquarters are in Worcester. Archibald G. MacDonald, a Nevada mining man, is president of the company; Wilber W. Hobbs, of Worcester, treasurer; John H. Johnson, vice-president; Matt W. Alderson, the cyanide expert, is consulting engineer. The prospectus of the company states that the property consists of 371 mining areas, comprising 310 acres, situated about 40 miles north of Halifax. The buildings include a 25-stamp mill. Some of the ore is in arsenical pyrites, and part of the new equipment of the mine will be a cyanide or other plant to recover the values from the tailings remaining from former operations.

Ontario—Rainy Lake.

Golden Star Mining and Exploration Company.—The annual meeting was held in Duluth, Minn., recently, when the following directors were chosen: Lewis A. Hall, Thomas Bailey, Bay Mills, Mich.; Lewis Hall, Niagara Falls, N. Y.; W. H. Hughes, New York. The board ordered the payment of \$10,000 to L. A. Hall for money advanced, and declared a dividend of 1%, payable February 25th. The capital stock is \$1,000,000, in \$1 shares. The secretary is A. E. McManus, Palladio Building, Duluth, Minn.

NEWFOUNDLAND.

Nova Scotia Steel and Iron Company.—It is reported that an arrangement has been concluded with H. M. Whitney, of the Dominion Coal Company, by which the large iron ore areas owned by the Nova Scotia Company on Belle Isle, in Conception Bay, pass into his control. It is estimated that the total deposit of ore is 50,000,000 tons. The property will be equipped with modern machinery, and according to report a large smelter will be erected near the mines of the Dominion Coal Company, at Cape Breton.

COAL TRADE REVIEW.

New York.

Feb. 17.

Anthracite.

So far as producers are concerned the general situation of the anthracite trade just now leaves little to be desired. Coming after an unexpectedly heavy consumption in January, the widespread and intense cold wave, with its accompanying snow storms, has made the consumption for the first half of February something beyond the wildest dreams of the most sanguine sales agent. From all over the West come stories of short supplies of coal and inability to get more. The intense cold is likely to make itself felt in still another way, for thick ice on the lakes may delay the opening of navigation considerably. At Duluth the movement from the docks was very great, due to temperatures of 50° below zero. In fact, at some Minnesota points temperatures of 60° below are reported. Coal has gone out at the rate of over 300 cars a day, and the movement was limited only by the supply of cars. In Chicago territory, chestnut coal, which has been in short supply for months, is now almost unobtainable. The price for this size has been advanced 50c. per ton over the February 1st figures, and other sizes are 25c. higher. The demand for coal has taxed dealers to the utmost. At Milwaukee stocks are said to be shorter than at Chicago, and at Detroit and other lake ports the demand for chestnut is beyond all hope of satisfaction. In the East, though the daily press spoke of a possible coal famine, the supplies at seaboard points have been sufficient. The stormy weather so far has been a hindrance to the companies by stopping work in breakers, delaying rail shipments and making it impossible to load coal at tidewater. Milder weather is freeing traffic and the demand is bound to be heavy through the balance of this month and during March.

The talk about a meeting of the anthracite presidents in New York on February 16th seems to have been one of those Philadelphia yarns that go the rounds of the press every week or two. At least, if such a meeting was held several important companies were not represented. Regarding the Anthracite Operators' Association and a new road to tidewater the evidence is accumulating that the independent operators are not anxious to build a road. It seems likely, however, that the attempt will be made to get these smaller companies in one large company which would control their lands and ship their coal over one of the existing roads. Vanderbilt interests are reported behind this movement. It is altogether likely that if such a company were brought out with the right interests behind it, and heralded with a flourish of trumpets as one that was to work the everlasting salvation of the anthracite trade, its stock would go like hot cakes in the present condition of the stock market. How far such a company would permanently better—the anthracite trade is another matter.

Prices at New York have been advanced somewhat, not by any agreement apparently, but because the companies had all the orders on hand they wanted, and raised prices to ease the situation. The Delaware, Lackawanna & Western is quoting as follows for free burning white ash f. o. b. tidewater: Broken, \$3.15; stove, \$3.75; egg, \$3.35; chestnut, \$3.65.

Bituminous.

The far-spread cold wave and furious snow storms have demoralized the Atlantic seaboard soft coal trade during the week. The demand has been active, and in some cases consumers had difficulty in supplying their needs, but it has been impossible to get coal forward. Cold weather at the mines kept down production and snow blockades on the railroads have delayed rail shipments.

When coal arrived at shipping points there was no way of getting it forward. As the weather was unusually cold in the South some Chesapeake Bay ports have been so filled with ice as to make it dangerous for vessels to try to get through. Philadelphia was blocked up tight, and the ice did not get out of the North River docks at New York until February 16th. Boats loaded with coal at Perth Amboy could not deliver to consumers in New York City. As a result of this, spot coal sold at all sorts of prices. It is reported that one lot for a steamship whose captain was anxious to get to a warmer climate sold at \$6 per ton. The storms of the week did not damage the coastwise fleet much as vessel owners have been cautious since the November blizzard, and captains have taken no chances. A great many vessels were ice-bound, but will be released by warmer weather. No rates for coastwise freight are given as such business is stopped entirely. With warmer weather the demand for coal is bound to be great.

Birmingham, Ala.

Feb. 13.

(From Our Special Correspondent.)

The coal trade in this district is just as active as it possibly could be. Every pound of coal

being mined is finding a ready sale and the conditions were never better. There are more mines in operation now with good contracts for their output than ever before. The prospects are bright for the same conditions for several months to come.

During the past week Superintendent A. J. Frazer, of the Southern Railway, with Division Freight Agent L. Green, of the same road, and officials of the mining companies in Walker County, escorted a number of sugar planters of Louisiana through the coal-fields. The visit was a pleasant one and the barge line, starting from Greeneville, Miss., and extending down to Louisiana on the Mississippi River, was shown the gentlemen. It was shown that Alabama coal could undersell the Pennsylvania product and there were no doubts now as to the ability to ship it when ordered. It is believed that the visit of the planters will result in orders for coal. Indications already point to a large amount of coal to be shipped down the Mississippi River this spring and summer, the estimate being placed at 150,000 tons.

The Tennessee Coal, Iron and Railroad Company, on account of the demands being made on it for fuel, has contracted with three or four of the smaller mines in the district for their entire output for several weeks to come. The various industries in blast and the railroads, which are doing an increased amount of business, are making strong demands for coal, and every effort is being made to keep the demand supplied, though it takes work to do.

The report of the State Mine Inspector for the year 1898 shows that more than 6,500,000 tons of coal were mined, and though it is early in the year, it is estimated that that amount will be increased this year. New mines are in the course of opening and in contemplation at several points in the district.

Chicago.

Feb. 15.

(From Our Special Correspondent.)

Anthracite Coal.—Rarely has Chicago and the West seen such a demand for hard coal as during the past week or 10 days. With the thermometer hovering for weeks below the zero mark, immense activity developed in the coal market; wholesalers and retailers generally were kept busy night and day in endeavoring to supply at least a part of the demand. It is providential that the cold weather let up during the past few days for Chicago was in a fair way to develop a genuine hard coal famine, dealers estimating that barely 100,000 tons remained in town, and at the rate of consumption, 10,000 tons per day, another week or 10 days of cold would have diminished the supply to beggary quantity. Dealers have been getting almost their own prices on hard coal, as much as \$5.25@ \$5.50 being asked, while circular rate is \$5. Chestnut coal cannot now be had in any quantity, the demand for this size having been such, with the supply limited, that the market is practically bare of chestnut at the present time.

Bituminous coal has never been in greater demand, and prices have advanced 25c. per ton. Out-of-town business has been exceedingly brisk, but the cold weather interfered with the free movement of soft coal to a considerable extent. There has been a great hole eaten into the soft coal supply during the past few weeks, many mines in Illinois, Ohio and Kentucky being closed on account of severe cold, and in consequence but little soft coal has been received here during the past week. Railroads continue the largest buyers, while office buildings and manufacturing industries are buying heavily. Prices are very firm.

Coke has been in excellent demand, with prices firm.

Pittsburg.

Feb. 16.

(From Our Special Correspondent.)

Coal.—The present cold spell is the most severe ever experienced in Pittsburg, and has thrown men out of work. Coal mining is at a standstill. The freeze-up has practically paralyzed the Pittsburg District just when the demand for fuel is heavier than usual. At every mine the screen is obstructed with a frozen combination of ice and coal. Operators say the suspension is more general from coal than at any time during the past 20 years. There is no coal whatever being mined. The men are able to work no matter how cold, but as long as it is impossible to get coal over the screen their efforts are practically useless. No work will be done until there is a general thaw.

Pittsburg coal operators failed to reach an agreement. After several meetings at Cleveland they failed to form any combination. The Pittsburg party returned home.

At Uniontown, Pa., the developments of last week have been fraught with bright prospects for the industrial future of this section. In addition to the sale of the Columbia steel plant to the Ohio Steel Company plant, the company has purchased 1,250 acres of coal land for coking purposes, and will erect 1,000 ovens in the spring. The Kanawha and New River operators in

West Virginia have agreed upon a plan of consolidation. The organization will be known as the Kanawha & New River Consolidated Coal Company. It will combine 80 companies in two districts.

The Pittsburgh coal fleet that left last week with several million bushels of coal are all either sunk or aground between here and Cincinnati, and if the present snow goes off with rain the entire fleet will probably be destroyed, as well as many of the packets that do business between the various points. The "Fred Wilson," a first-class towboat, is sunk and her tow will probably be lost. A splendid new passenger packet 290 ft., being finishing at Marietta, was forced on shore by the ice and stands a good chance of being lost.

Preparations for starting the three big mines of the Essen Coal Company have begun and mining will be resumed this week; the mines are located on the Pittsburgh, Chartiers & Younghiogheny Railroad; have been idle since November; 1,200 men will find employment.

At West Newton, Pa., on Monday, D. H. Williams sold 300 acres of coal land to the Eureka Coal Company. The land is located on both sides of the Younghiogheny. Consideration, \$15,500.

Latest.—The weather is now favorable for a thaw. There will be no coal famine in Pittsburgh as was feared. Several powerful towboats were employed to break the ice in the pool, enabling loaded barges, coal, to reach the city. There was, however, a material advance in the prices of coal.

Connellsville Coke.—The boom in the coke trade continues; both production and shipments show gains; many are of the opinion that the present number of ovens, if fully employed, will not be able to supply the demand in the near future. Of the 18,643 ovens in the region, 15,999 are active with a number making ready to start. Production for the week, 167,136 tons; the production last week exceeded all records. At the present rate of production of the region, in 1899 it will probably reach 9,000,000 tons.

The Ohio Steel Company has purchased 1,200 acres of coal land; proposes to build 1,000 ovens in the Spring.

Summary of the region shows there was an increase in the active list of 220 ovens; about 100 ovens are expected to start the present week. The shipments amounted to 9,361 cars. The shipment in tons shows an increase over the previous week of 175 tons. A fairly good supply of cars is being furnished this week. The shipments were distributed as follows. To Pittsburgh, 3,172 cars; sent West, 4,775 cars; sent East, 1,414 cars. Total, 9,361 cars. Prices are unchanged.

San Francisco. Feb. 8.

(From Our Special Correspondent.)

Coal receipts at San Francisco by water for the month of January show a number of changes as compared with last year. There was an increase of 19,925 tons from Washington and a decrease of 19,734 tons from British Columbia. Receipts from Australia, were unusually light. Eastern coal arrivals included two cargoes, 4,400 tons, of anthracite from Philadelphia, and one, 1,951 tons, of Cumberland from Baltimore.

The total receipts for the month were: Eastern United States, 6,351 tons; Oregon, 7,283; Washington, 59,137; British Columbia, 27,833; Australia, 2,394; Great Britain, 11,853; total, 114,851 tons.

This statement does not include receipts from the Mount Diablo and the San Joaquin Company's mines in California; nor those from Rocky Mountain mines by rail.

As compared with January, 1898, the total receipts showed an increase of 6,145 tons, or 5.6 per cent. Stocks of coal on hand are not heavy.

Shanghai, China. Jan. 9.

(Special Report of Wheelock & Co.)

Coal.—Japan coal has been very dull, and a few sales have been made at as low as 5@5.50 taels per ton. Cardiff coal is slightly weaker, while absolutely nothing is being done in Sydney Wollongong. Arrivals of all kinds of coal during the fortnight were 15,458 tons. Quotations per ton are as follows: American anthracite, 15 taels, nominal; Welsh Cardiff, 19 taels; Australian Wollongong, steamer cargo, 1 taels, and other sorts, 6.75@7 taels; Japan, all contracted for; Chinese Kaiping, lump, 7@8 taels; dust, 6 taels and mixed, 5.80@6.50 taels.

Kerosene Oil.—A very fair retail business has been done in American oil during the past fortnight, notwithstanding the holidays, and a good quantity changed hands at 1.66@1.68½ taels per case. Deliveries have been up to the average, amounting to about 115,000 cases. Stocks in godowns are now estimated at 996,727 cases. In Batum and Langkat oil little has been done. Stocks of the former amount to 359,400 cases; of the latter there is little or no stock. We quote per case as follows: American Devoes, 1.75 taels; Russian Anchor and Horse Chop, 1.68½ taels, and bulk oil, 1.57½ taels; Sumatra Langkat, 1.65 taels, all for two months' delivery less 2%.

SLATE TRADE REVIEW.

New York. Feb. 17.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries is given below:

Prices of Roofing Slate.

Size, inches	Monson or Br'n ville.	Bangor.	Bangor Ribbon.	Alb'n. or Jackson Bangor.	Lehigh.	Peach Bottom.	Sea Gr'n.	Unfaded Green.	Red.
28 x 14..	6.00	3.35	2.90	3.10	3.50	4.75	2.50	3.50	6.50
26 x 14..	6.10	3.35	2.90	3.10	3.50	4.75	2.50	3.50	6.50
24 x 16..	6.10	3.35	2.90	3.10	3.50	4.75	2.50	3.50	6.50
24 x 15..	6.10	3.35	2.90	3.10	3.50	4.75	2.50	3.50	6.50
24 x 14..	6.10	3.35	2.90	3.10	3.50	4.75	2.50	3.50	6.50
24 x 13..	6.60	3.35	2.90	3.10	3.50	5.00	2.50	3.50	6.50
24 x 12..	6.60	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
24 x 10..	6.10	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
22 x 14..	6.10	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
22 x 13..	6.60	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
22 x 12..	6.60	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
22 x 11..	6.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
20 x 14..	6.40	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
20 x 13..	6.90	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
20 x 12..	6.80	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
20 x 11..	6.80	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
20 x 10..	6.80	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
18 x 18..	6.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
18 x 14..	6.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
18 x 12..	6.80	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
18 x 11..	7.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
18 x 10..	7.20	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
18 x 9..	7.10	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
16 x 16..	7.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
16 x 14..	6.80	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
16 x 12..	6.90	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
16 x 10..	7.10	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
16 x 9..	7.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
16 x 8..	7.20	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
14 x 14..	7.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
14 x 12..	6.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
14 x 10..	6.60	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
14 x 9..	6.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
14 x 8..	6.60	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
14 x 7..	6.40	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
12 x 10..	5.80	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
12 x 9..	5.60	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
12 x 8..	5.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
12 x 7..	5.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
12 x 6..	4.80	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
11 x 10..	4.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
11 x 8..	4.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
11 x 7..	4.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
10 x 12..	4.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
10 x 11..	4.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
10 x 8..	4.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
10 x 7..	4.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
10 x 6..	4.00	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50
9 x 7..	3.50	3.35	2.90	3.10	3.50	5.00	2.40	3.50	6.50

A square of slate is 100 sq. ft. as laid on thereof.

In Brownville and Monson delivery quotations can be had somewhat lower than above, which is also true of other brands. No. 1 Bangor are 50c. extra when full 3-16 in. thick, and Peach Bottom 25c. extra per square. Purple sizes run 24x12 and 14x7, and vary from \$3.75 to \$4 per square. Variegated and mottled, \$2.25@2.90 per square, according to size. Intermediate sea-green, \$2@2.25 per square. Intermediate red, 14x7 and larger, \$6; 12x6, 12x7 and 12x8 in., \$5 per square, net.

The stormy weather has made itself felt in the slate trade, and dealers, therefore, report a very quiet week.

In export circles the movement of slate has been interfered with by the delay to steamers on their way to this port. The heavy fall of snow has also delayed the unloading of slate at the shipping ports. Some difficulty is also being experienced at the quarries, where transportation is irregular.

January exports from New York were valued at \$48,224, as against \$76,063 in December, and \$86,480 in January, 1898. This great reduction is attributed to the higher rates of freight this year and the reduced prices of the Welsh product. But there is a very hopeful feeling manifest among exporters that as the year advances the situation will improve. Meantime missionary work will continue in the foreign markets.

Figures of exports from the United States in 1898 have just been completed, and these show a total value of \$1,363,144, as against \$1,156,302 in 1897, and \$515,958 in 1896. The 1898 exports were the largest on record. The port of New York alone shipped \$1,010,984 worth of slate in 1898, as against \$790,844 in 1897. Much the larger part of the roofing slate exported went to the United Kingdom, while the school slates were taken by the Far East, particularly India and Africa.

Of late there have been several fair sized orders received for billiard table tops for England, while some mantel stock was shipped to Newfoundland. Marbleized slate used for wainscoting and facings for wood mantels is quoted 50¢@80¢ per superficial foot, according to color and quantity. These prices hold good for reproductions of onyx and fine foreign and domestic marble. During the latter part of last year a leading concern in Vermont furnished about 5,000 sq. ft. of imitation onyx for a hotel in California.

Freight rates from New York are as follows: To Liverpool, 13s. 6d. (\$3.24); London, 13s. 9d. (\$3.30); Manchester, Bristol, and Hamburg, 15s.

(\$3.60); Hull and Newcastle, 17s. 6d. (\$4.20); all with a 5 per cent. primage per ton weight.

Roofing cement varies in price from 4c. to 7c. per lb., according to quantity and package. This cement is used by slate and tile roofers, and a good demand is distributed throughout the United States.

Slate flour, greenish, is quoted at \$11.25 per ton, and other kinds, finely bolted, at \$9.25, f. o. b. cars New York.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements, see also page 226.)

New York. Feb. 17.

Heavy Chemicals.—Buyers are plenty and prices firm. A scarcity in foreign bleaching powder and chlorate of potash is felt, and holders are asking higher prices. The imports of bleaching powder this week amounted to 388 casks and 252 bbls., while only 50 kegs of chlorate of potash came to hand at this port. Receipts of domestic soda ash amounted to 660 sacks and 575 pkgs. Imports of bleaching powder into the United States in the year 1898 amounted to 108,462,828 lbs., of which 73,801,600 lbs. came from the United Kingdom. In 1897 the imports were 109,176,451 lbs., of which Great Britain furnished 75,430,000 lbs. The exports from the United States in 1898 were 28,605 lbs., against 40,916 lbs. in 1897. The imports of caustic soda in 1898 were 24,981,873 lbs., against 57,742,392 lbs. in 1897; the exports were 1,237,257 lbs., against 1,824,565 lbs. in 1897. The imports of sal soda in 1898 amounted to 5,090,768 lbs., against 15,991,955 lbs. in 1897, and of this quantity there were exported 1,272 lbs. in 1898, as against nothing in the previous year. The imports of soda ash in 1898 amounted to 67,973,939 lbs., against 133,664,105 lbs. in 1897; the exports in 1898 were 4,246,673 lbs., against 2,246,181 lbs. in the previous year. Of our total imports of alkali the United Kingdom sent us 85,539,300 lbs., against 192,540,000 lbs. in 1897. The imports of chlorate of potash into the United States in 1898 amounted to 4,806,402 lbs. in 1897; the exports were 25,150 lbs., against 15,369 lbs. in 1897.

Quotations are: Caustic soda, domestic, high test, \$1.40@1.45 per 100 lbs. f. o. b. works; \$1.50@1.65 delivered. Foreign caustic soda, high test, \$1.60@1.70 delivered, according to test and quality. Powdered caustic soda, 2½@2¾c. Alkali, domestic, 55@60c. f. o. b. works; 65@70c. delivered; foreign, 70@75c. Bleaching powder, English prime brands, \$1.60@1.62½ per 100 lbs.; other brands, \$1.45@1.50. Continental F. prime, \$1.55@1.60. Bicarb. soda, domestic, ordinary, \$1.15@1.25 per 100 lbs. f. o. b. works. Natrona brand, \$1.65; "Arm and Hammer brand," \$3.25@3.50, less the usual discount; foreign, \$2.12½@2.25 per 100 lbs., according to brand and style of package. Sal soda, domestic, 50c. per 100 lbs., f. o. b. works, less the usual discounts; English, 60@62½c. per 100 lbs. Concentrated sal soda, foreign (crystal carbonate), \$1.60@1.70 per 100 lbs.; domestic (mono-hydrate crystals), \$1.25@1.35 per 100 lbs.; "snowflake," \$1@1.12½ f. o. b. Syracuse. Chlorate of potash, crystals, 9@9¼c.; powdered, 9½@9¾c. per lb.

Acids.—The talk of the trade is the building up of a strong combination to succeed the old agreement known as the Knickerbocker Chemical Company, which has a capitalization of \$25,000. This old "pool" was formed in 1889, had about 13 of the leading acid makers around New York on its list, and for a time everything went along smoothly. But as soon as the outside concerns began to cut prices the members of the combine were obliged to do likewise, and so for a number of years it has been rather a difficult matter to hold to any agreement. Competition became so severe even among themselves that a new agreement was suggested, and after much deliberation and numerous meetings the General Chemical Company was formed. Incorporation papers have been filed at Albany and the capitalization placed at \$25,000,000. Many of the firms in the new agreement (as mentioned in our "Industrial" column) were prominently connected with the Knickerbocker Chemical Company. It is understood that more concerted action will prompt the business of the new company. A meeting is shortly to be held in New York for the purpose of electing officers.

Trade in the East is dull at present. Exports of blue vitriol continue large. Imports at New York were 55 casks and 20 bbls. oxalic acid. The exports of domestic made acids from the United States in 1898 amounted to \$189,907, against \$105,435 in 1897. The exports of blue vitriol in 1898 amounted to 14,529,466 lbs., valued at \$466,244.

Quotations per 100 lbs. for New York and vicinity are as follows: Acetic acid, commercial, No. 8, \$1.30@1.40; muriatic acid, 18°, \$1.10 for drums, and \$1.15@1.75 for carboys; 20°, \$1.20@1.87½; 22°, \$1.35@2.25, according to quantity and brand. Nitric acid, 36°, \$3.50@4.75; 38°, \$3.75@4.62½; 40°, \$4@4.87½; 42°, \$4.62½@5.25. Oxalic acid, \$6.25@6.50. Mixed acids, according to mixture. Sulphuric acid, 66°, \$1.10 for drums and

\$1.15@1.75 for carboys. Chamber acid, 50°, in a jobbing way, \$11.50@12 per ton f. o. b. factory. Blue vitriol (copper sulphate), \$5.75@6 per 100 lbs. for best grades.

Brimstone.—The market continues firm, and on spot best unmined seconds are quoted \$23.50@24, while futures are \$21.75@22 per ton. Best thirds rule about \$2 less per ton. Paper mills have been doing a large business, and their consumption of brimstone is increasing. The imports of brimstone into the United States in 1898 amounted to 159,790 tons, against 138,846 tons in 1897 and 145,318 tons in 1896. There were re-exported during 1898 1,414 tons, against 194 tons in 1897.

Pyrites.—Demand is widening, while prices rule firm. Production has been largely increased during the past year, while our imports in 1898 amounted to 171,870 tons, valued at \$544,165. We note a charter of a British steamer of 1,462 tons from Huelva to New York, Philadelphia or Baltimore at 8s. 3d. (\$1.98), sailing March 1st-25th.

Spanish pyrites contain from 46% to 51% sulphur, the American from 42% to 44%, and Pilley's Island, N. F., about 50%. Quotations are: American lump ores (basis 52%), \$3.25 per long ton f. o. b. mines, Mineral City, Va.; \$5 per long ton f. o. b. mines, Charlemont, Mass., and \$6.50 per long ton for Pilley's Island, delivered in New York. Fines are \$3 per long ton, f. o. b. Mineral City, Va.; \$4.25 at Charlemont, Mass., and \$4.50 for Pilley's Island, delivered in New York. Spanish pyrites, 11@13c. per unit, according to percentage, delivered ex-ship New York and other Atlantic coast ports.

Salt-petre.—There is a fair demand for crude at 4@4½c., and refined at 4½@5½c. per lb., as to grade and quantity. The stocks on hand January 1st, 1899, were reported at 2,822 bags, against 15,468 bags in 1898. Arrivals in January, 1899, were 202 bags, against 1,537 bags in 1898. The consumption in January, 1899, amounted to 1,903 bags, against 2,740 bags in 1898. The stocks on February 1st were the smallest on record, being only 1,121 bags, against 14,265 bags in 1898 and 19,068 bags in 1897. Messrs. C. A. Morris & Son report that there is on the way by mail and cable advice 14,256 bags, as against 15,594 bags at the same time in 1898. The apparent supply is 15,377 bags, as against 29,859 bags in 1898.

Stocks in England and Calcutta are reported to be very small.

Nitrate of Soda.—Buying is still limited, while holders ask \$1.65 per 100 lbs. for spot, and \$1.55 up for futures. In 1898 the United States imported 147,494 tons of nitrate of soda, against 94,965 tons in 1897 and 115,504 tons in 1896. Of this quantity 735 tons were re-exported in 1898, against 903 tons in 1897.

Fertilizing Chemicals.—Southern cotton planters are more hopeful of the future, and in some cases are laying in fertilizers, but it is not expected that the demands will show any marked increase for some time to come. In potash salts inquiries are being received for contract supplies. The agents of the German Kali Works have issued a new schedule of prices for the season of 1899. These quotations are practically the same as last year. In 1898 the consumption of potash salts in the United States exceeded that of the previous years. The imports of muriate of potash alone amounted to 104,358,601 lbs. in 1898, as against 108,839,049 lbs. in 1897 and 88,525,983 lbs. in 1896. Of these imports we re-exported 128,300 lbs. in 1898 and 55,000 lbs. in 1897. The total exports of domestic fertilizers from the United States in 1898 amounted to 587,662 tons, valued at \$5,115,440, as against 551,046 tons, valued at \$5,136,546 in 1897. The largest quantity went to Germany, and the next to the United Kingdom. An increased quantity has gone to Asia and Oceania.

A combination of Eastern fertilizer manufacturers has been formed after many meetings. It is capitalized at \$20,000,000, and will have a total output of from 800,000 to 1,000,000 tons of fertilizers yearly. The Bradleys, of Boston, are the prime movers. Fuller details are given in our "Industrial" columns.

Prices show some changes this week, and in the case of dry fish scrap and bone meal they are higher. Quotations are: Sulphate of ammonia, gas liquor, \$2.65@2.70 (basis of 25%) per 100 lbs.; bone, \$2.60@2.65. Dried blood, high grade Western, \$1.92@1.95 per unit; New York, \$1.70@1.72½ per unit. Azotine, \$1.70@1.75, basis New York. Concentrated phosphates (30% available phosphoric acid), 5½c. per unit. Acid phosphates, 13@15% av. P₂O₅, 60@65c. per unit at sellers' works in bulk. Dissolved bone black, 17@18%, P₂O₅, \$16@16.50 per ton. Acidulated fish scrap, \$9.75@10; dried, \$18.75@19 f. o. b. fish factory. Ammonia superphosphates, high grades, \$25@26 per ton. Tankage, high grade, \$14.50@15 per ton f. o. b. Chicago; \$18.50@19 at New York. Concentrated tankage, \$1.90@1.95 per unit f. o. b. Chicago; low grade, \$13@13.50 per ton. Bone tankage, \$19.50@20.50; ground bone, \$20@21 delivered. Bone meal, Calcutta, to arrive, \$25@26, and domestic steamed, \$20.50 per ton.

Potash Salts.—Quotations are on the basis of foreign invoice weights, tares and analysis to the ports of New York, Boston and Philadelphia, as follows, per 100 lbs. in quantities of not less than 500 tons bulk salts or 50 tons concentrated salts: Muriate of potash, 80@85%, basis of 80%, \$1.75, and 95%, \$1.78; sulphate of potash, 90%, \$1.95½, and 96%, basis of 90%, \$1.98½; double manure salt, 48@53%, basis of 48%, \$1.00½; manure salt, 20% actual potash, 64c., and 30%, 87c. For Kainit, testing 12.4% actual potash, quotations are: \$8.45@8.70 per long ton of 2,240 lbs. Sylvinit is quoted at 36½@37½c. per unit sulphate of potash. All these prices hold good until March 31st next, after which the customary advance will be charged as follows, per 100 lbs.: Muriate of potash, all grades, 3c., basis 80%; sulphate of potash, all grades, 3c., basis 90%; double manure salts, 48@53%, 2c., basis 48%; manure salt, 20% and 30%, 2c. The increased price for kainit will then be 25c. per long ton, and for sylvinit ½c. per unit sulphate of potash.

Phosphates.—Miners are not ready sellers, and we understand at least one large producer of high-grade rock in Florida is not taking orders. This concern is asking up to \$10 per ton, while others seek \$9.25. It is estimated that the shipments of Florida rock in January amounted to 45,000 tons, and it is expected that February will show a still further increase. The shipments of high-grade Florida rock from Savannah, Ga., in January amounted to 4,419 tons, and from Fernandina 15,387 tons. Port Tampa also reports shipments in January of 19,518 tons rock and pebble phosphates.

Export demand continues good, but charters at present are not numerous. Those noted this week are a British steamer of 1,515 tons from Fernandina to Gothenburg and (or) Gaddriken at 19s. (\$4.56) to one port, or 20s. (\$4.80) for the two, March sailing. Another was taken from Charlotte Harbor to the Adriatic at 20s., February sailing. The latest quotations for American phosphates, c. i. f. United Kingdom or North Sea ports, are as follows: Florida hard rock, 77@80%, 8½d. per unit, all positions; Florida land pebble, 68@73%, 7½d.; Florida Peace River, 58@63%, 7d., and Tennessee, 78@80%, 7d. The Algerian 63@70% phosphates are quoted at 7½d. per unit. The shipments of phosphates from Bone, Algeria, in 1898 amounted to 223,822 tons, against 207,177 tons in 1897 and 145,993 tons in 1896. The largest quantity was consumed by the United Kingdom, while France came second. The two best months in the year were December and July.

Quotations are: Florida high grade, 75@80% rock, \$9@9.25 per long ton f. o. b. Fernandina. The freight rate to New York is about \$1.90 per ton. Florida land pebble, 68@73%, quoted at \$5.50@6 per ton, delivered in New York; South Carolina ground rock is worth \$5.50 to \$5.75 per short ton, delivered in New York; sun dried, \$3 per 2,240 lbs. f. o. b. Ashley River; hot-air dried, \$3.25 f. o. b. same place, and \$3.45 f. o. b. Charleston, S. C. Tennessee phosphate, \$3.50@4 f. o. b. Mt. Pleasant, according to quality.

Liverpool. Feb. 1.

(Special Report of Joseph P. Brunner & Co.)

The market for heavy chemicals has gone very quiet, although prices are well maintained. The principal feature of interest is sulphate of copper, which continues to boom, and the syndicate have to-day put the price up to £23 10s. per ton less 5% for February delivery, with a premium of 10s. for March delivery, and a further premium for later months.

Soda ash is in moderate request, while quotations vary considerably according to market. We quote maximum spot range for tierces about as follows: Leblanc ash, 48%, £4 5s.@£4 10s.; 58% £4 10s.@£4 15s. per ton, net cash. Ammonia ash, 48%, £4@£4 5s.; 58%, £4 5s.@£4 7s. 6d. per ton, net cash. Bags are 5½s. per ton under price for tierces. Soda crystals are selling at £2 17s. 6d. per ton, less 5% for barrels, with special terms for certain favored quarters. Bags are 7½s. per ton under price for barrels. Caustic soda is rather slow as regards fresh business, but makers are fairly busy on contract deliveries, and prices are firm. We quote spot range as follows: 60%, £5 17s. 6d.@£6; 70%, £6 17s. 6d.@£7; 74%, £7 7s. 6d.@£7 10s.; 76%, £7 15s.@£7 17s. 6d. per ton, net cash. Bleaching powder in the absence of any pressure to sell is steady at £5@£5 2s. 6d. per ton, net cash, for hardwood packages.

Chlorate of potash is quiet and unchanged at 3½@3½d. per lb. for crystals and 3%@3¼d. per lb. for powdered as to quantity.

Bicarb. soda is moving off at varying prices according to market, ranging from £5 5s.@£6 15s. per ton less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is rather idle, and lower at £10 10s.@£10 12s. 6d. per ton, less 2½%, for good gray 24@25% in double bags f. o. b. here as to quantity.

Nitrate of soda is about unchanged at £7 15s.@£8 per ton, less 2½%, for double bags f. o. b. here as to quantity and quality.

IRON MARKET REVIEW.

NEW YORK, Feb. 17, 1899.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending				From	
	Feb. 15, 1898.	Feb. 17, 1899.	Jan., '98.	Jan., '99.	Tons.	Tons.
An'racite	26	17,250	32	25,450	127,723	163,560
Coke.....	144	206,750	146	207,250	1,430,423	1,462,190
Charcoal.	15	5,150	17	5,150	37,048	40,030
Totals..	185	229,150	195	238,850	1,595,194	1,668,780

The trade continues extremely active, and the mills show no signs of relaxing their haste in turning out material. In fact, makers now hesitate whether to take out new orders, and the pressure is on the part of buyers and not sellers. The February reports of the blast furnaces, however, show a small drop in the productive capacity at work, which was not expected. It was due to the necessity of blowing out several stacks for repairs before others were ready to take their places.

There has been a further rise in prices. So far as raw materials are concerned, however, it is to be remembered that the present advances affect only late buyers, the great majority having arranged for their supplies over the first half of the year at the quotations prevailing a month or two ago. Whether the present standards of price are to be maintained will be determined later, when the big contracts for the second half of the year come to be considered.

For finished material there is a very active call and in some descriptions it is not at all easy to place orders. This is especially the case with plates, and some work must be postponed or delayed until the mills are able to make deliveries. The second half of the big West Australian order, for plates for the Cooligard pipe line, has been finally rejected here and has been taken by several German mills. Some large orders for structural material for New York and Chicago have been placed, and several more are to come on the market soon, including a lot for the new East River Bridge.

The pipe makers have given notice of an advance of 5%, and another is expected soon. Contracts have been let for nearly 200 miles of pipe for gas lines in the West.

The recent advance in wire nails has been followed by a similar one in cut nails. The wire trust people are developing a tendency to work their control of the trade for all it is worth, which is very likely to make trouble for them by-and-by.

Concerning the other new combinations, there are plenty of rumors, but very little positive news. The new National Steel Company has been buying some coal lands in the Connellsville coke region, and evidently means to control its own coke supply. The Eastern mills have evidently decided to keep out of the cast-iron pipe combination, and a fight between them and the trust may be looked for.

Meantime the trade generally and the people are pondering over the trust business carefully. The result is very uncertain, but is quite likely to make itself apparent next year.

Notes of the Week.

A dispatch from Pittsburg, February 16th, says: "The Pipe Machine and Manufacturing Company, one of the latest combinations among iron, steel and tin plate manufacturers, was organized here to-day. The new combination embraces all the leading pipe and spout manufactories in the United States. At to-day's meeting representatives of 30 manufactories throughout the United States were in attendance. The following officers were chosen: President, Charles D. Clark, Peoria, Ill.; vice-president, Benjamin P. Opydek, Philadelphia; secretary, Alex. Glass, Wheeling, W. Va."

Birmingham, Ala. Feb. 13.

(From Our Special Correspondent.)

There are no changes to note in the pig iron market in this district. The production continues heavy, and the shipment is as heavy as it has been for the past two months and longer. There is a little advance being demanded for the product now, but it is no greater than what has been asked for the past three or four weeks, though very few purchasers are giving it. The advance of 50c. per ton on freight on all iron sold for domestic purposes has had the effect of causing the demand for iron to hesitate a little, though foreign shipments on bookings of several weeks since make up the difference. The quotations are not troubling purchasers any, the statement being made that the figures are not being adhered to closely. The following are the figures given for the product now: No. 1 foundry, \$8@8.50; No. 2 foundry, \$8@8.25; No. 3 foundry, \$7.50@8; gray forge, \$6.75; No. 1 soft, \$8@8.50; No. 2 soft, \$8.

The furnaces in blast are still working hard, though the very cold weather that has been on for several days is interfering with the labor, especially the colored labor, and if it keeps up it is likely to be felt. For the first time this

season there was snow yesterday in this district, and a heavy fall. It had a tendency to keep the colored furnace hands away from their work and it was with some trouble that a full force has been kept. The weather before yesterday and for four or five days has been exceedingly cold.

The finished iron trade is holding its own and the rolling mills are still working hard, and their product is finding a ready sale. The various departments at the mills are keeping up, with no indications of an early cessation. As the Birmingham Rolling Mill will not make any surplus stock, it is quite evident that the demand is brisk. There is a rumor of an advance in the product of the rolling mills throughout the country, but so far no change in prices is to be noted in this section. The foundries and machine shops are still hard at work. It is stated that the machine shops and foundries are doing better than they have for some time.

The cold weather has hindered the progress on the big steel plant and steel wire and rod mill at Ensley, near here, during the past two weeks. The sale of the Mary Pratt Furnace property, located just outside of the city limits of Birmingham, is reported. The price paid for the property is said to be \$50,000, and it will be turned into a large manufacturing concern. Who are the purchasers is not stated. The property consists of a furnace with all necessary side tracks, cars and other equipment, besides a good-sized body of land. The furnace has been idle for several years.

The pipe works at Bessemer continue in full blast. There is nothing new heard here about the recent pipe combination. So far no further move has been made on the erection of the new pipe foundry or casting works by the Ad-dyston Pipe and Foundry Company of Ohio, as was proposed for the Bessemer district.

Buffalo, N. Y. Feb. 15.

(Special Report of Rogers, Brown & Co.)

This week has been rather an active one for Lake Superior charcoal iron and coke malleable. Several good-sized orders have been placed for this class of material at the full prices mentioned below. In foundry iron, the market has not been quite so active, but evidently due from the fact that there is very little iron being offered. Jobbing foundries report they are running full and are now getting a fair advance to compensate for the advance in pig iron. We quote for cash f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$13.25; No. 2 strong foundry coke iron, Lake Superior ore, \$12.75; Ohio strong softener, No. 1, \$13; Ohio strong softener, No. 2, \$12.50; Jackson County silvery No. 1, \$14; Southern soft No. 1, \$14.25; Southern soft No. 2, \$13.75; Lake Superior charcoal, \$13.50; coke malleable, \$12@12.75.

Cleveland. Feb. 15.

(From Our Special Correspondent.)

Iron Ore.—The sales of iron ore during the past few days have not been so numerous as they were a week ago. This condition of the market was not unexpected, however, for the reason that only moderate amounts of this season's ore remain to be sold. The bulk of the ore which will be mined during the year 1899 has already been disposed of, and in some grades nothing can be offered for sale unless more is mined during the season than is expected at the present time. Sales made were on the following basis: Specular and magnetic ores, Bessemer quality, \$3.35@3.55; specular and magnetic ores, non-Bessemer quality, \$3.05@3.25; hematite ores, Bessemer quality, \$2.75@3.25; hematite ores, non-Bessemer quality, \$2@2.25.

Pig Iron.—The demand has been quite active during the past week and a fair trade is reported all along the line, there being transactions in all sorts of metals. As a consequence the market continues strong and the tendency of prices is upward. Slight additions have been made to all the quotations of a week ago. Following are the present quotations, f. o. b., Cleveland: Lake Superior charcoal, \$11.75; Bessemer, \$11.25@11.50; No. 1 foundry, \$11.75@12; No. 2, \$11.50@11.95; No. 1, Ohio Scotch, \$11.75@12; No. 2, \$11.50@11.75; gray forge, \$11.

Philadelphia. Feb. 16.

(From Our Special Correspondent.)

Pig Iron.—There is general uneasiness in the pig iron trade. It is visible at every point. Rumors which probably have no foundation go to help the unrest. There appears to be no other escape than a general advance; in fact, an advance in prices has been announced within 24 hours. This may and may not be genuine, because of the impossibility of filling orders. Furnaces are oversold and there is scarcely any iron to sell and these quotations represent that condition rather than the actual value of iron. The fact is growing more and more evident that there will not be enough iron to go around. Quotations must be given as they are made, and are as follows: No. 1 X foundry, \$13@13.50; No. 2 X foundry, \$12@12.50; plain, \$11.50@11.75; standard forge, \$11.25@11.50; Basic, \$11; low phosphorus, \$16.

Billets.—The quotations made within 48 hours

for billets represent the scarcity and oversold conditions, rather than the actual value. People who simply must have billets have been paying \$20@\$21 delivered, and agents of makers intimate they may have to pay more. The outlook is very hazy, and the drift of opinion is that prices will continue very high.

Merchant Bars.—One very interesting feature is the stronger chances of a considerable foreign trade. This week's business has been unimportant, but there is a large volume of new business awaiting its chance. Quotations are 1.10@1.15c. for common iron; refined, 1.20c.; test, 1.25c.; steel bars, 1.20@1.30c.

Sheets.—Sheet iron has been advanced \$3 per ton since Tuesday, under an extraordinary demand.

Pipes and Tubes.—Under the sympathetic advance a larger business showed itself to-day in belated mails. It is a question how much more business mills will book. Another advance is inevitable.

Merchant Steel.—Prices have been marked up all along the line, and another advance is rumored as coming. Bids have been made on a large amount of business, and unless accepted this week, the quotations will be withdrawn and intending buyers will have to pay the higher prices.

Plates.—The alarming inquiries from bridge, ship and other large builders are creating confusion. The advances made on all plate mill products have only increased the desire of the smaller consumers to get contracts placed, but they are having a rocky road to travel. Ordinary tank is in demand at 1.65c.; flange, 1.80c.; fire-box, 2@2.40c.

Structural Material.—The rush for construction material promises to bring about an early advance on combination prices, which, up to now, have remained unchanged. In anticipation of this inevitable advance, a great deal of business has been placed since last week, despite the storm. Angles are 1.45c.; beams and channels, 1.50@1.60c.

Rails.—An advance to \$21 has been mentioned as a possibility, because most mills have very little capacity to spare for the next four months. Quotations are to-day nominally \$20 for standard sections. A great deal of business has appeared in sight, but it is confidently predicted a number of orders for midsummer delivery are soon to be placed.

Old Rails.—Iron rails sold to-day at \$14. Steel rails are offered at \$11.50. Prospects are bright for a few big transactions, as buyers recognize the market is against them.

Scrap.—Choice railroad scrap has advanced to \$14, and it sells at that. All scrap is moving upward. Old car wheels are \$11.50. Heavy milling steel sells at \$11.50, with \$12 asked for occasional lots. Steel axles, when they are to be had, will bring \$13.

Pittsburg. Feb. 16.

(From Our Special Correspondent.)

There is little sign of falling off in either finished or raw products, with plants all along the line crowded with work; the advance of last week was fully maintained; the tendency is still upward, although present prices are far in advance of those governing the market for a long time. The business offering is generally in as large volume as ever, but a good deal is turned down or postponed for further consideration. This seems to be the story in most parts of the country. The leading markets at present undoubtedly are Pittsburg, Chicago and Cleveland. The South is embarrassed temporarily by the advance in freights, which places Southern iron at a disadvantage compared with the products of Northern furnaces. At the same time the many negotiations for consolidation going on arrest trade in some quarters and disturb it in others, causing irregularity in prices to a certain extent.

The Alabama furnaces are said to have a \$3 rate to most of the British ports, however, so that what they lose in one direction they gain in another. Deliveries by the Southern furnaces for export during 1899 aggregate about 250,000 tons with unfilled orders estimated at close to 100,000 tons additional. The lower freight rate will, therefore, be very helpful to the group of Southern furnaces, and will, no doubt, lead to increased sales for export.

It is understood that 25,000 to 30,000 tons have been worked through since the beginning of the year, and as the shortage abroad is even greater than it is here, there ought to be a very large business done in that direction.

Finished Material.—There is an extraordinary demand for every kind of material at a further advance and manufacturers are compelled to turn down more business than they accept, as they are already filled to their utmost limit.

Wire nails are firm and active; last week's advance fully maintained with current sales \$1.60@1.65.

Wrought Iron and Steel Pipes.—Very firm and

active; the consolidation appears to be checked for the present; one plant only holding out.

Steel Rails.—Market firm at a further advance. Sheet Bars.—Market very firm; prices tending upward.

Ferro Manganese steady, sales 80%, delivered, \$52.50.

Old rails and scrap very firm and advancing.

Latest.—There is no let up in the firmness of the iron and steel market. The demand is extraordinary, taking the season into consideration. Pittsburg Bessemer sold at \$11.65, advance since Friday, 15c. Valley Bessemer advanced the same amount. Billets sold at \$18.50, a further advance. Mill iron commands more money. Muck bar sold up to \$20.50, the highest point reached for a long time. Scrap iron and old rails still tending upward. The weather is moderating, which will assist business beyond a doubt. The outlook for the Spring and Summer trade is very rosy all along the line.

COKE SMELTED LAKE AND NATIVE ORE.		FERRO-MANGANESE.	
Tons.	Cash.	Tons.	Cash.
3,000 M. In, F. M., P.	\$11.65	50 Imp., 80%, del., P.	\$52.50
2,500 Mill In, M., A., V.	10.85	STEEL WIRE RODS.	
2,000 B., M., A., V.	10.50	1,000 Delivered, P.	\$25.50
1,500 B., M., V.	10.50	CHARCOAL.	
1,000 B., M., A., P.	11.65	250 Warm Blast P.	\$16.75
1,000 M. In, M., A., P.	11.65	150 Cold Blast P.	21.50
1,000 B., Spot, V.	10.80	100 Ex. C Blast, P.	25.00
1,000 B., M., A., D., P.	11.65	100 Cold B., No. 2, P.	21.50
800 B., M., P.	11.50	100 Cold Blast, P.	21.50
600 B., F., P.	11.50	75 No. 3 F'dy, P.	15.25
500 Off. B., M., P.	11.00	50 No. 2 F'dy, P.	15.25
500 M. In, A., M., P.	11.50	50 Warm Blast, P.	16.00
500 B., F., P.	11.65	50 Cold Blast, P.	22.00
500 B. spot, V.	11.00	OLD IRON AND STEEL RAILS.	
500 M. In, P.	10.75	2,500 Steel Rails, gr. P.	\$10.50
450 No. 2 F'dry, P.	11.50	1,000 Iron Rails, gr. V.	14.50
250 No. 1 F'dry, P.	11.75	1,000 Ex. S. R's, gr. P.	11.25
200 No. 2 F'dry, P.	11.00	500 Ex. I R's, gr. P.	15.25
100 No. 2 F'dry, P.	10.95	SCRAP MATERIAL.	
100 No. 1 F'dry, P.	11.75	1,200 H'vy. M. S gr., P.	\$10.50
100 No. 2 F'dry, P.	11.50	750 Bu. Scrap, net, V.	9.00
BLOOMS, BILLETS, SLABS.		600 Cast Scr'p, gr. P.	9.25
2,500 Blts. M., A., D., P.	\$18.50	500 Wrot. S. net, V.	11.75
1,500 Blts. M., A., D., P.	18.25	500 W. S. S. Div. net, V.	12.80
1,000 Billets, F., M., P.	18.50	300 Wr. T'ngs, net V.	7.00
500 Billets, M., P.	18.25	200 Cast B'ngs, net, V.	6.00
500 Billets, M., A., P.	18.50	200 Old C. W., nt, V.	14.50
MUCK BAR.		New York. Feb. 17.	
1,000 Neutral, P.	\$20.50	The local market is generally active, with a good volume of business in sight. In export trade we note inquiries for 12,000 ft. of wrought iron pipe from Brazil; large orders for and shipments of hardware, pumping machinery and machine tools to Germany, an order for \$17,000 worth of pumping machinery from Russia, some unusually large orders for pumps, iron pipe and architectural iron from England; shipments of \$57,950 worth of manufactured iron, and \$12,000 worth of agricultural implements to Australia.	

Pig Iron.—In response to the great demand at consuming points, prices have advanced decidedly. No large orders have been taken here during the week, but there is a very fair amount of iron changing hands at the higher quotations. We quote: Northern brands, tide-water delivery, No. 1 X foundry, \$12.75; No. 2 X foundry, \$12.25; No. 2 plain, \$11.75; gray forge, \$11.75; Southern brands, New York delivery; No. 1 foundry, \$13; No. 2 foundry, \$12.75; No. 1 soft, \$13; No. 2 soft, \$12.75; No. 3, \$12.25; basic, \$12.25.

In warrant irons prices have shown little change. Alabama No. 1 has been steady at 88%, and No. 2 at 88%, while No. 3 has been 77%; No. 4, 77%, and gray forge, 77.78.

Bar Iron.—The local market is inclined to be quiet; in fact, there is less inquiry than in any other line, but prices are pretty firm. We quote, for large lots on dock: Common, 1.15c.; refined, 1.25c.

Plates.—The local consumption is not heavy, but the market is strong in response to the demand at other points. Prices are firm and we quote: Tank, 1/4-in. and heavier, 1.65c.; 3-16-in., 1.70c. Shell is quoted for 1.70c.; flange, 1.75c.; marine, 1.80c.; firebox, 1.85c.; Universals, 1.37 1/2c.; charcoal iron plates, 2.25c. for shell, 2.75c. for flange; iron rivets, 2.25c.; steel rivets, 1.75@1.85c.

Structural Material.—Some good-sized contracts have been taken during the week, with more in sight. The new East River Bridge towers and end spans will take about 12,000 tons. The new specifications are like the old in calling for acid open-hearth steel.

Steel Rails.—Prices are firm. No sales of any size are reported during the week. We quote: Standard sections, \$20 at tidewater, with girder rails \$24. Lighter rails are quoted: 12-lb., \$26; 16-lb., \$24; 20-lb., \$24; 25-lb., \$22; 30-lb., \$22; 35-lb., \$22; up to standard, \$21, with the usual 10% advance for smaller orders; all f. o. b. mills. Track fastenings are quoted: Angle bars, 1.20c.; fish plates, 1.20c.; spikes, 1.50c.; bolts, 1.75c.

Nails.—Prices for wire nails are firmly held

by the American Wire and Steel Company, and we now quote car loads on dock \$1.80; cut nails are firm at \$1.50 for large lots on dock.

Cast Iron Pipe.—The new consolidation of makers is confined to works in the South and Middle West. The only Eastern firm is the McNeil Company. The contract for 1,900 tons for Worcester has been secured by the Warren Foundry and Machine Company.

Old Material.—The market for scrap is active. There is a great demand for old rails for export, the movement is limited only by the ability to get freight room. We quote, for New York deliveries: Old iron rails, \$13.50@14; old steel rails, \$10.50; hammered car axles, \$16; old car wheels, \$11; No. 1 wrought, \$11; machinery cast, \$10; burnt iron, \$5.50.

METAL MARKET.

NEW YORK, Feb. 17, 1899.

Gold and Silver.

Gold and Silver Exports and Imports
At all United States ports, January and year.

	January.		Year.	
	1898.	1899.	1898.	1899.
GOLD.				
Exports	\$2,658,663	\$2,330,503	\$2,658,663	\$2,330,503
Imports	6,493,414	6,066,080	6,493,414	6,066,080
Excess I.	\$3,834,751	\$3,735,577	\$3,834,751	\$3,735,577
SILVER.				
Exports	4,301,820	5,358,900	4,301,820	5,358,900
Imports	2,535,461	2,591,718	2,535,461	2,591,718
Excess E.	\$1,766,359	\$2,767,182	\$1,766,359	\$2,767,182

This statement includes the exports and imports at all United States ports, the figures being Treasury Department.

Gold and Silver Exports and Imports, New York
For the week ending Feb. 16th, 1899, and for years from January 1st, 1899, 1898, 1897, 1896.

Per-iod.	Gold.		Silver.		Total Ex-cess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$11,000	\$828,601	\$323,786	\$58,348	I. \$552,163
1899.	374,831	3,650,678	4,061,629	416,229	E. 368,553
1898.	3,371,475	3,939,866	6,486,776	445,697	E. 5,472,688
1897.	341,156	290,575	5,442,754	292,474	E. 5,200,866
1896.	9,202,885	15,079,966	5,671,583	226,915	I. 434,414

The exports of gold were very small; those of silver went chiefly to London. The imports of gold were from Europe; those of silver from the West Indies and South America.

The United States assay office in New York reports the total receipts of silver at 151,000 oz. for the week.

Financial Notes of the Week.

Business continues active and the growth of trade generally has not been disappointing. The bank clearing statements, the railroad traffic reports and other generally accepted indications show a large volume of business. The speculative markets show some reaction, but this is not altogether to be regretted. Money continues fairly easy, and the New York bank statement again shows an expansion in loans. In London and Berlin money is also easier.

The great snowstorm, which extended over a large part of the country, has caused a temporary delay and disturbance of business. Delivery of goods, arrivals of mails and the general transaction of affairs has been checked for several days. In some cases even the telegraph wires were not available for two or three days.

The market for silver has been steady. The chief feature is the fact that forward rates are the same as prompt. Buyers are willing to pay for May delivery the same for prompt shipment. Outside orders rather than Indian purchases have lately been absorbing the bullion.

The statement of the foreign trade of the United States, made by the Bureau of Statistics of the Treasury Department, shows that the exports in January were large, though they fell below the very high level of the three months from October to December. The statement is as follows:

	1898.	1899.
Exports	\$108,426,674	\$115,515,954
Imports	60,827,714	58,472,315
Excess, exports	\$57,598,960	\$57,043,639
Add excess of exports, silver		2,767,182
Total	\$59,810,821	\$59,810,821
Deduct excess of imports, gold		3,735,577
Apparent balance		\$56,075,244

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

The statement of the United States Treasury on Thursday, February 16th, shows balances in excess of outstanding certificates as below, com-

parison being made with the statement for the corresponding date of last week:

	Feb. 9.	Feb. 16.	Changes.
Gold	\$227,716,003	\$227,551,454	D. \$164,549
Silver	9,382,080	8,473,432	D. 908,648
Legal tenders	14,463,228	15,360,555	I. 897,327
Treas. notes, &c.	1,962,125	1,987,121	I. 24,996
Totals	\$253,523,436	\$253,372,562	D. \$150,874

Treasury deposits with national banks amounted to \$87,299,096, a decrease of \$261,589 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending February 11th, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

	1897.	1898.	1899.
Loans and discounts	\$500,367,700	\$639,836,400	\$750,043,300
Deposits	568,075,100	738,683,800	880,059,100
Circulation	16,723,500	13,914,700	14,633,600
Reserve:			
Specie	80,192,500	114,967,700	198,501,300
Legal tenders	113,464,500	102,140,300	69,025,300
Total reserve	\$193,657,000	\$217,108,000	\$267,526,600
Legal requirement	142,018,775	184,670,950	223,014,775
Balance surplus	\$51,538,225	\$32,437,050	\$35,511,825

Changes for the week, this year, were increases of \$8,516,700 in loans, \$8,036,600 in deposits and \$3,293,500 in specie; decreases of \$68,000 in circulation, \$1,225,200 in legal tenders and \$1,940,850 in surplus reserve.

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 dates last year:

Banks.	1899.		1898.	
	Gold.	Silver.	Gold.	Silver.
New York				
Assoc.	\$114,967,700		\$198,501,305	
England.	167,469,320		169,991,650	
France	385,932,593	\$241,598,529	364,763,000	\$239,851,900
Germany.	152,835,000	78,730,000	149,105,000	71,660,000
Austria-				
Hung'y	182,065,000	62,055,000	179,060,000	62,265,000
Spain	47,475,000	53,100,000	55,310,000	43,665,000
Belgium.	14,740,000	7,370,000	16,170,000	8,085,000
N'th'rlds	13,140,000	34,195,000	21,570,000	33,920,000
Italy.	77,990,000	10,670,000	75,145,000	11,720,000
Russia.	585,040,000	20,600,000	505,195,000	22,005,000

The returns for the Associated Banks of New York are of date February 11th, the Banks of England and France, February 16th, and the others are of date February 9th, 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. The Bank of England reports gold only.

Shipments of silver from London to the East for the week ending February 2d, 1899, are reported by Messrs. Pixley & Abel's circular as follows:

	1898.	1899.	Changes.
India	£702,500	£411,500	D. £291,000
China	108,096	205,380	I. 97,284
The Straits	81,900	5,000	D. 76,900
Totals	£892,496	£621,880	D. £270,616

Arrivals for the week this year were £151,000 in bar silver from New York. Shipments were £88,500 in bar silver to Shanghai, and £35,000 to Bombay; total, £123,500.

Daily Prices of Metals in New York.

February	Silver.		Copper.		Tin.	Lead.	Spel-ter.	
	Fine oz. Cts.	Lon-don. Pence	Lake, cts. @ lb.	Elec-tro-lytic, ard £ @ lb.				
11	4.85%	59%	27½	18	17	24¼	4.45	6.25
13	4.85%	59%	27½	18	17	24¼	4.45	6.25
14	4.85%	59%	27½	18	17	24¼	4.45	6.25
15	4.85%	59%	27½	18	17	24¼	4.45	6.25
16	4.85%	59%	27½	18	17	24¼	4.45	6.25
17	4.85%	59%	27½	18	17	24¼	4.45	6.25

Average Prices of Metals per lb., New York.

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.
Jan	14.75	10.99	22.48	13.87	4.18	3.65	5.34	3.96
Feb.	11.28	11.28	14.08	14.08	3.71	3.71	4.04	4.04
March	11.99	11.99	14.38	14.38	3.72	3.72	4.25	4.25
April	12.14	12.14	14.60	14.60	3.63	3.63	4.26	4.26
May	12.00	12.00	14.52	14.52	3.64	3.64	4.27	4.27
June	11.89	11.89	15.25	15.25	3.82	3.82	4.77	4.77
July	11.83	11.83	15.60	15.60	3.95	3.95	4.66	4.66
August	11.89	11.89	16.23	16.23	4.00	4.00	4.58	4.58
Sept.	12.31	12.31	16.03	16.03	3.99	3.99	4.67	4.67
October	12.41	12.41	17.42	17.42	3.78	3.78	4.38	4.38
Nov.	12.66	12.66	18.20	18.20	3.70	3.70	5.20	5.20
Dec	12.93	12.93	18.30	18.30	3.76	3.76	5.10	5.10
Year	12.03	12.03	15.70	15.70	3.78	3.78	4.57	4.57

The price given in the table is for Lake Copper. The average price of electrolytic copper in January was 14.26c.

Average Prices of Silver per oz. Troy.

Month.	1899.		1898.		1897.	
	Lon'd'n Pence.	N. Y. Cents.	Lon'd'n Pence.	N. Y. Cents.	Lon'd'n Pence.	N. Y. Cents.
January	27.42	59.36	23.29	56.77	29.74	64.79
February	25.89	56.07	25.89	56.07	29.68	64.67
March	25.47	54.90	25.47	54.90	28.96	63.06
April	25.95	56.02	25.95	56.02	28.36	61.85
May	26.31	56.98	26.31	56.98	27.86	60.42
June	27.09	58.61	27.09	58.61	27.58	60.10
July	27.32	59.06	27.32	59.06	27.36	59.61
August	27.48	59.54	27.48	59.54	24.93	54.19
September	28.05	60.68	28.05	60.68	25.66	55.24
October	27.90	60.42	27.90	60.42	26.77	57.57
November	27.93	60.60	27.93	60.60	26.87	57.93
December	27.45	59.42	27.45	59.42	26.83	58.01
Year	26.76	58.26	27.55	59.79		

The New York prices are per fine ounce; the London quotation is per standard ounce, 925 fine.

Prices of Foreign Coins.

	Bid.	Asked.
Mexican dollars	\$.47	\$.48½
Peruvian soles and Chilean pesos	.42½	.43
Victoria sovereigns	4.85	4.87
Twenty francs	3.84	3.88
Twenty marks	4.73	4.78
Spanish 25 pesetas	4.78	4.84

Other Metals.

A statement has been published in New York and elsewhere to the effect that options on a number of the large smelting plants had been given to parties, who propose to consolidate the smelting business under one company, purchasing all the more important plants of the country. With regard to this we are informed on good authority that some advances have been made, but no options have been given and the negotiations are still in a preliminary stage, with some uncertainty as to whether they will go any further.

Copper.—Business has been seriously handicapped by the heavy storms during the week, and copper was no exception. The rolling mills are running to their utmost capacity and are supplied with orders for several months ahead. A good deal of additional business has been refused by them. While most mills are supplied with raw material, some of them are not, and their orders will tend to maintain what would appear to be the otherwise abnormal prices now ruling, for the product of the mines which is not already contracted for for the next few months seems to be infinitely small, and naturally so. A great deal of copper is still being delivered on contracts entered several months ago, at considerably lower prices than are now quoted, and additional sales were made by producers as the market advanced, so that when prices reached the present level they had little or nothing left—at least, not for the next four or five months. The result is that, although the prices abroad for the speculative descriptions have declined during the week not inconsiderably, values for copper here have been fully maintained, closing at 18@18½c. for lake; 17@17½c. for electrolytic copper in cakes, bars or ingots; 16½@17c. for cathodes, with casting copper nominal at 17c.

The London market has undergone marked changes, opening on Monday at £75 10s., or about £2 higher than it closed on Friday. From that it declined gradually to £72 10s. for both spot and three months. Refined and manufactured kinds have, for the same conditions governing prices here, declined but slightly, the quotations being: English tough, £77@£77 10s.; best selected, £77 10s.@£78; strong sheets, £78; India sheets, £83; yellow metal, 6¼d.

Statistics for the first half of the month again show a decrease of 200 tons, bringing the total visible supplies down to 25,800 tons. Imports of copper ore and regulus into the United States in 1898 amounted to 3,090 tons, against 5,173 tons in 1897; of copper in pigs, bars, etc., 24,181 tons, against 7,401 tons in 1897, and manufactures to the amount of \$39,467, against \$58,897 in 1897.

Copper production, as reported by Mr. John Stanton, who acts as statistician for the companies, was as follows for the month of January, stated in long tons (2,240 lbs.) of fine copper:

	1897.	1898.	1899.
Production.	16,937	16,544	16,774
U. S., reporting mines	700	1,200	1,850
U. S., outside sources			
Total, United States	17,637	17,744	18,624
Europe, reporting mines	6,595	5,556	5,852

Total, United States..... 24,232
Exports, United States..... 9,651
Total..... 33,883

The United States production shows an increase of 880 tons over last year, and the foreign reporting mines a gain of 296 tons.

Tin.—After we went to press last week the market immediately began to improve, and by Monday prices had advanced to about 24½c., but values have since sagged off, the price to-day being 23@23½c., with the market in a more or less demoralized condition, as appears only too natural, considering that fluctuations during the last few weeks have been so extremely wide and

sudden and well adapted to unsettle the legitimate business in which this article is used.

The conditions, as above outlined, were the result of those governing the London market, where prices at the end of last week advanced from £106 10s. to £111 on Monday, declining since, without a halt, to £104.

Imports of tin in bars, etc., into the United States in 1898 amounted to 28,013 long tons, against 24,631 tons in 1897; principally from the East Indies. The exports of tin in bars, etc., in 1898 amounted to 330 tons, against 389 tons in 1897.

Lead.—There has been as sudden an improvement in prices as there was a decline last week. The latter, it has since turned out, appears to have been a forced one and confined to the New York market only. The moment there appeared to be buyers, sellers withdrew and the market advanced quickly to about 4.55c., but this price could not be maintained, the closing figure being 4.45@4.50c., as against 4.35c. when we went to press last week.

The foreign market advanced early in the week to £14 15s., but closes decidedly easier at £14 2s. 6d. @ £14 5s. for Spanish, and £14 5s. @ £14 7s. 6d. for English lead.

Imports of lead ore into the United States in 1898 amounted to 79,651 long tons, against 82,247

tons in 1897; of lead in pigs, bars, etc., 390 long tons, against 484 tons, and of manufactures \$3,329, as against \$4,856 in 1897.

Exports of domestic lead in pigs, bars, etc., in 1898 were 112 long tons, and of other lead \$206,833, against \$210,282 in 1897. The exports of foreign lead in ore and base bullion in 1898 amounted to 69,681 long tons, against 50,334 tons in 1897, and of manufactures \$540, as against \$28,884 in 1897.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: "Lead is firm and fairly active. The price is nominally 4.30@4.35c., according to brand and delivery.

Spelter is extremely strong and prices have again scored a considerable advance, business having been done at about 6c. in St. Louis and 6¼@6½c. at New York. Consumption is constantly improving, and as the result, a scarcity is felt for immediate deliveries.

The London market, too, has advanced considerably, the closing quotation being £28.

Imports of spelter into the United States in 1898 amounted to 1,224 long tons, against 1,142 tons in 1897, and of manufactures \$13,447 as against \$19,431 in 1897. Exports of domestic zinc ore from the United States in 1898 amounted to 10,520 tons, against 8,260 tons in 1897, and of spelter 9,375 long tons, against 12,719 tons in 1897; also \$141,932 worth of manufactures, against \$71,021 in 1897. Exports of foreign spelter in 1898 amounted to 16 long tons, against 41 tons in 1897; also \$137 worth of manufactures, against \$233 in 1897.

Antimony remains in good demand and prices have again improved, that for Cookson's being 10½c., and for Hallett's, "C" and U. S. Star 9¼@10c.

Imports of antimony ore into the United States in the year 1898 amounted to 1,663 long tons, against 2,456 tons in 1897. Imports of antimony regulus in 1898 amounted to 904 long tons, against 512 tons in 1897. The exports of ore in 1898 amounted to only 15 long tons, and of regulus to 11 tons, against 17 tons and 2 tons respectively in 1897.

Nickel continues on unchanged lines, and no alteration in prices can be reported. We quote for ton lots 33@36c. per lb., and for smaller orders 35½@38c. London prices are 14@16d. per lb., according to size and order.

Exports of nickel, including oxide and matte, from the United States in 1898 amounted to 2,526 long tons, against 1,899 tons in 1897.

Platinum.—Demand is active and prices continue high. For large lots \$15.50 per ounce is now quoted in New York; for smaller orders \$16@17. The London quotation is \$2@64s. an ounce.

Imports of platinum into the United States in 1898 amounted to 6,927 lbs., against 5,697 lbs. in 1897.

Quicksilver.—The New York quotation remains \$42 per flask. The London prices is £8 5s., with £8 4s. named from second hands.

Exports of domestic quicksilver from the United States in 1898 amounted to 981,497 lbs., against 1,007,770 lbs. in 1897, and 1,525,726 lbs. in 1896.

The Minor Metals.—Quotations are given below for New York delivery:

Aluminum.....	Per lb.	Per lb.
No. 1, 98% ingots..	30@40c.	Bismuth..... \$1.40
No. 2, 90% ingots..	31@34c.	Phosphorus..... 48@50c.
Rolled sheets.....	38c. up	Pingstein..... 70c.
Nickel alloy.....	33@39c.	Ferro-tungstein, 60% 60c.

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

MINING STOCKS.

Complete quotations will be found on pages 223, 224 and 225 of mining stocks listed and dealt in at:

Baltimore.	New York.	Mexico.
Boston.	Philadelphia.	Paris.
Butte.	Pittsburg.	Rossland.
Cleveland.	St. Louis.	Shanghai.
Colo. Springs.	Salt Lake.	Toronto.
Denver.	San Francisco.	Valparaiso.
Spokane.	London.	

New York. Feb. 17.

There is an improved undertone manifest in the local mining share market, notwithstanding the softening of prices in many shares.

In the Colorado group the Cripple Creeks, notably Isabella, have received most attention. Early in the week Isabella fell to \$1.35 from \$1.50 last Friday, but a day later it rose to \$1.40, only to recede again to \$1.35, at which it closes. This company will pay a 6c. dividend on February 25th, books close February 18th, and reopen February 27th. This is the first dividend since June, 1897, when ½c. per share was distributed. After paying this dividend, the company will still have a good surplus in the treasury. Elkton Consolidated receded three points since the opening, selling at \$1.12 to-day. Portland, after paying the usual monthly dividend of 2c. per share on February 15th, sold at \$1.95, at which it rules steady. Moon Anchor sold at \$1.20. In the cheaper stocks, Burt Gold, of the Prentice In-

vestment group, sold from 12¼c. down to 4c., but rallied again to 13¼c., while High Five rose from 9 to 10½c. Jennie Blanche of Gilpin County, gained a point, selling at 36½c. yesterday. Gold King, which will pay its first dividend of \$10,000 on February 20th, sold at \$1@1.02 this week. Gilpin & Lincoln, of Gilpin County, rose from 36¼ to 39¼c. this week, and the stock that is being sold is taken from the treasury, which will be used, it is said, in further developing the property. Golden Fleece, after losing 3c. at 40c., recovered to 43¼c., but at the close it is asked for at 40c. For the Leadville stocks a small demand is noticeable. Iron Silver, after reaching 80c., dropped three points to 77c., and recovering to 85c., receded again to 82c., at which bids are being made at the close. Little Chief hovered between 18 and 21c. Mollie Gibson touched 40c., but gradually dropped to 28c. Breece shows a gain to \$1.38.

In the South Dakota group, Homestake is held firmly at \$50. This company will pay the usual 50c. monthly dividend on February 25th, making \$7,306,250 distributed thus far.

Of the California stocks, Standard Consolidated has sold up to \$2.40, though as low as \$2.25 has been quoted, but holders appear unwilling to accept less than \$2.50 at the close. Brunswick Consolidated seems to be getting a little more support and in consequence prices have risen from 8 or 9c. a few months ago, to 33c. this week, while at the close to-day 30c. has been bid. A single sale of Syndicate was made at 10c. The Quicksilver stocks are dormant, ordinary being quoted at \$1.25, and preferred at \$5.

The American Coal Company will pay a semi-annual dividend of 4%, and an extra of 1% on March 1st.

The Spensazuma Gold Mining and Milling Company, of Arizona, is said to be selling stock at \$15 per share, the par value of which is \$10. We would again urge our readers to carefully investigate the claims of this company before investing.

Boston. Feb. 16.

(From Our Special Correspondent.)

The two days' holiday on Saturday and Monday with the very severe storm, which cut off mails and the telegraph, too, to some extent, and kept a good many people away from their offices, put a serious limitation on business this week. Practically half the week was lost, and in the remaining days there was not activity enough to make up. I do not mean by this that the market was dull, but there was hardly as much life as we had a week ago.

New companies continue to come up, and promoters are in full swing. The public seems to be getting a little more cautious, however, and the new stocks are meeting a little more careful scrutiny. It is quite possible that this may be followed by a burst of confidence, but it is not a bad sign.

The Kankanna Copper Mining Company is a new concern which will operate on the tract next to the northward of the Wyandot. The property is in the hands of R. Skiff Sheldon, now in Boston, and comprises about 1,000 acres. It is to be placed on the market at \$3 per share.

J. D. Cuddihy of Calumet, now in the East, has option on the 120 acres next to the Hancock mine, giving a total area of 280 acres. Mr. Cuddihy expects to place the property in New York.

3 p. m.—To-day the market was considerably less active in mining stocks, though more active in the general list. Old Dominion led the mining stocks in animation, being unusually active, advancing \$1½ to \$38½, now \$38½; Montana rose further from \$360 to \$375, closing \$371; Tamarack, \$241; Quincy, \$178; Calumet & Hecla, \$780; Franklin, \$27¼; Osceola, \$98¼; Butte, \$92; Arcadian, \$73¼; Atlantic, \$42; Centennial, \$46¼; Old Colony, \$19¼; Bingham, \$16¼; Utah, \$45¼; Wolverine, \$48¼; Santa Fe, \$19¼; Boston Consolidated, \$15; Baltic, \$32¼; Victor, \$3; Pioneer, \$7¼; Isle Royal, \$58¼; Gold Dredging, \$31¼; Union, \$10¼; Cochiti offered at \$11¼; Miners, \$42½ bid; Winona, \$16¼; Rhode Island, \$11¼; Parrot touched \$44, now \$42½; Washington, \$3¼; Adventure, \$14¼; Ashbed, \$2; Mohawk, \$30¼; Allouez, \$10¼; Tecumseh, \$9¼; Humboldt, \$2¼; Ysabel, \$16; Merced, \$8¼; Victoria, \$11 bid.

San Francisco. Feb. 11.

(From Our Special Correspondent.)

Business on the exchanges this week has not been remarkable for its extent. The market was firm, so far as it went, and there was an increase in prices all around, but the trading is still all among the insiders, and the public does not develop any special desire to buy mining stocks—at any rate, the well-worn stocks that are dealt in on our exchanges.

Some quotations noted are: Consolidated California & Virginia, \$2.15; Ophir, 95c. @ \$1; Sierra Nevada, 95@96c.; Mexican, 62c.; Best & Belcher, 61@63c.; Gould & Curry, 37@38c.; Hale & Norcross, 33@36c.

The feature of the market was the rise in Ophir and Mexican. Hale & Norcross also has taken a considerable start upward, and others will probably follow.

Imports and Exports of Metals

Port.	Week, Feb. 15.		Year, 1898.	
	Expts.	Impts.	Expts.	Impts.
*New York.				
Aluminum.....long tons	40	114	72	10
Antimony ore.....			184	
" regulus.....			30	
Chrom. ore.....			110	
Copper, fine.....	927	185	7,526	295
" wire.....			189	
" matte.....	72		234	315
" ash.....		119		31
" sulphate.....	155		1,126	
" other.....		125		30
Ferro-chrome.....				
Ferro-mangan. se				
Ferro-silicon.....				
Iron ore.....				5
" pig, bar, rod	58	1120	702	439
" pipe.....	431		3,755	
" plates.....			85	
" other.....			235	
Lead.....	850	573	7,738	5,723
Manganese ore.....				129
Metals, old.....	6	189	139	378
Composition.....	248		573	
Nickel.....			267	
Rail'd material			1,296	220
Rails, old.....			2,233	
Spiegeleisen.....				48
Steel billets, etc.	1,115	1407	4,963	1,951
" rails.....			11,362	
" hoops.....			279	
" wire.....			2,659	
" nails.....	730		2,177	
" not spec'd.	28	160	1,569	289
Tin.....		110		3,650
" dross or ashes				48
" and black plates, boxes		118,390		46,812
Zinc.....long tons		13		12
" dross.....	7		64	
" dust or ashes.....	104		198	
" ore.....			801	
" oxide.....	31		477	48
" skinnings.....			160	
†Baltimore.				
Aluminum.....long tons				
Antimony regulus.....casks				
Brass scrap.....long tons				
Chrom. ore.....				
Copper, fine.....	102		3,490	
" matte.....				
" sulphate.....			322	
Ferro-manganese				549
Ferro-silicon.....				50
Iron pig, bar, etc.		200	470	1,105
" ore.....		8,189		26,624
" pipe.....			1,730	
" pyrites.....				6,581
" other.....	1			5
Lead.....				
Machinery.....			115	
Manganese ore.....				3,203
Metals, scrap.....			207	
Spiegeleisen.....				34
Steel, bars, p'ces, &c.	407		7,855	48
" wire.....			51	100
" rails.....			2,000	
" nails.....			84	
" pipe.....	263		573	
" not spec'd.....			9	
Tin.....				44
" dross.....				
" and black plates, boxes				18
Zinc.....long tons				17
*Philadelphia.				
Antimony.....casks				
Chrom. ore.....long tons				
Copper ore.....			7,174	
Ferro-manganese.....			70	
Iron, pig.....				7,250
" ore.....				
" pyrites.....				7,250
Manganese ore.....		1,760		11,390
Spiegeleisen.....				300
Steel.....				235
" and black plates, boxes		110		
Zinc ore.....long tons		625		1,675

*New York Metal Exchange returns. †By our Special Correspondent. ‡Not mentioned elsewhere. †Imports for week, February 9th.

STOCK QUOTATIONS.

NEW YORK. Table with columns: NAME OF COMPANY, Location, Par Val, Feb. 11, Feb. 13, Feb. 14, Feb. 15, Feb. 16, Feb. 17, Sales. Lists various mining and industrial stocks.

BOSTON; MASS. Table with columns: NAME OF COMPANY, Par Val, No. of shares, Feb. 10, Feb. 11, Feb. 13, Feb. 14, Feb. 15, Feb. 16, Sales. Lists various mining and industrial stocks.

COAL AND INDUSTRIAL STOCKS. Table with columns: NAME OF COMPANY, Location, Par Val, Feb. 10, Feb. 11, Feb. 13, Feb. 14, Feb. 15, Feb. 16, Sales. Lists coal and industrial stocks.

CLEVELAND, O. Feb. 15. Table with columns: NAME OF CO., Iron Range, Par Val, Bid, Ask, NAME OF CO., Iron Range, Par Val, Bid, Ask. Lists Cleveland stocks.

BUTTE, MONT. Feb. 10. Table with columns: NAME, Location, Par Val, Quotations, Sales, NAME, Location, Par Val, Quotations, Sales. Lists Butte stocks.

PHILADELPHIA, PA. Table with columns: NAME OF COMPANY, Location, Par Val, Feb. 10, Feb. 11, Feb. 13, Feb. 14, Feb. 15, Feb. 16, Sales. Lists Philadelphia stocks.

COLORADO SPRINGS, COLO. Table with columns: NAME OF COMPANY, Par Val, Feb. 6, Feb. 7, Feb. 8, Feb. 9, Feb. 10, Feb. 11, Sales. Lists Colorado Springs stocks.

BALTIMORE, MD. Feb. 16. Table with columns: NAME OF COMPANY, Location, Par Value, Bid, Ask, NAME OF COMPANY, Location, Par Value, Bid, Ask. Lists Baltimore stocks.

ST. LOUIS, MO. Feb. 15. Table with columns: NAME OF COMPANY, Location, Par Value, Latest Bid, Ask, Sales, NAME OF COMPANY, Location, Par Value, Latest Bid, Ask, Sales. Lists St. Louis stocks.

By Telegraph. Table with columns: NAME OF COMPANY, Par Val, No. of Shares, Feb. 13, Feb. 11, Feb. 15, Feb. 6. Lists telegraphed stock prices.

STOCK QUOTATIONS.

DENVER, COLO.†

Table of stock quotations for Denver, Colorado, listing various mining companies and their share prices from Feb. 6 to Feb. 11, 1899.

Official Quotations Denver Stock Exchange. Sales: Mines, 256,350 shares; Prospects, 419,550 shares; grand total, 675,700 shares.

SALT LAKE CITY, UTAH.*

Feb. 4

Table of stock quotations for Salt Lake City, Utah, listing various mining companies and their share prices as of Feb. 4, 1899.

*From Our Special Correspondent. †Utah companies. ‡Mines in Vanderbilt, Cal. §Mines in Tuscarora, Nev.

SPOKANE WASH.‡

Feb. 16.

Table of stock quotations for Spokane, Washington, listing various mining companies and their share prices as of Feb. 16, 1899.

‡Telegraphic quotations of the British-Canadian Investment and Mining Syndicate. *Under Republic management.

SAN FRANCISCO, CAL.†

Table of stock quotations for San Francisco, California, listing various mining companies and their share prices from Feb. 10 to Feb. 16, 1899.

Official telegraphic quotations, San Francisco Stock Exchange

TORONTO, CAN.*

Table of stock quotations for Toronto, Canada, listing various mining companies and their share prices from Feb. 10 to Feb. 16, 1899.

*Official quotations of the Toronto Mining and Industrial Exchange. Total shares sold, 38,262.

ROSSLAND, BRITISH COLUMBIA.*

Feb. 9.

Table of stock quotations for Rossland, British Columbia, listing various mining companies and their share prices as of Feb. 9, 1899.

*From Our Special Correspondent.

VALPARAISO, CHILE.*

Dec 31.

Table of stock quotations for Valparaiso, Chile, listing various mining companies and their share prices as of Dec 31, 1898.

*Special report of Jackson Bros. Values are in Chilean pesos or dollars.

MEXICO.

Feb. 9.

Table of stock quotations for Mexico, listing various mining companies and their share prices as of Feb. 9, 1899.

NOTE.—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many newer companies have a nominal par value, usually \$5 or \$100. Prices are in Mexican dollars.

SHANGHAI, CHINA.*

Jan. 16.

Table of stock quotations for Shanghai, China, listing various mining companies and their share prices as of Jan. 16, 1899.

*Special report of J. P. Bisset & Co. The prices quoted are in Shanghai taels.

STOCK QUOTATIONS.

LONDON.

Feb. 3.

Table of stock quotations for London, listing companies, countries, authorized capital, par value, last dividend, and current quotations.

*Dividend pending.

PARIS.

Jan. 26.

Table of stock quotations for Paris, listing companies, countries, products, capital stock, par value, latest dividend, and current prices.

MEETINGS.

Table of company meetings, listing company name, location, meeting type, date, and place.

DIVIDENDS.

Table of dividends, listing company name, current dividends, paid since Jan. 1, 1899, and total to date.

*January dividend paid. †Paid by the English Company.

ASSESSMENTS.

Table of assessments, listing company name, location, no. delinq., sale, and amount.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last). Rows list various mining companies like Adams, Etna, Alaska-Treadwell, etc.

Gold, S. Silver, L. Lead, C. Copper, B. Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. Previous to consolidation Bodie paid \$1,677,572, Bulwer \$190,000, and Mono \$12,500. § Capitalization reduced September, 1898. ¶ Reincorporated in September, 1898. †† The old War Eagle Company paid \$240,000 in dividends to July, 1897, and levied \$32,500 in assessments. ‡‡ Lillie transferred to an English company in October, 1898; old company paid \$134,110 in dividends to September 1, 1898. Note.—This table is corrected up to January 16. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT 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 Jan. 30th. 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 Review of Chemicals and Minerals.

Table with multiple columns listing various chemical and mineral products such as Abrasives, Calcium, Mercury, Potassium, and others, along with their respective units and prices.

THE RARE ELEMENTS.

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

Table listing rare elements such as Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cobalt, Gallium, Germanium, Glucium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Palladium, Rhodium, Ruthenium, Selenium, Silicon, Tellurium, Thallium, Thorium, Vanadium, and Zirconium, with their units and prices.

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(See Pages 754, 769 and 19 of Engineering and Mining Journal, Dec. 24, 1898.)

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ASSAYER AND CHEMIST, EXPERIENCED, desires position, Mexico or South America preferred. First-class references. Address X., ENGINEER- ING AND MINING JOURNAL, No. 18,415, March 25.

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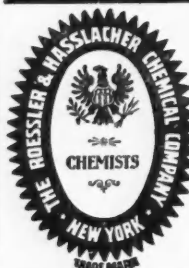
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