THE ENGINEERING AND MINING JOURNAL AND COAL

(Published Every Saturday at 253 Broadway, New York.)

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LXVII. FEBRUARY 25. No. 8.

RICHARD P. ROTHWELL, C. E M. E., Editor.

ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor.

THE SCIENTIFIC PUBLISHING CO., Publishers.

Subscriptions are PAYABLE IN ADVANCE For the United States, Mexico and Canada, $5 per annum; all other countries in the Postal Union, $7.

When change of address is desired, both old and new address should be sent

NOTICE OF DISCONTINUANCE.—The JOURNAL is not discontinued at expiration of subscription, but is sent until an explicit order to stop is received by us. We find that a large majority of our subscribers prefer not to have their subscriptions interrupted, and their files broken in case they fail to remit before expiration. It is therefore assumed, unless notification to discontinue is received, and the amount of back subscription paid to date, that the subscriber wishes no interruption in his eries. PAPERS RETURNED ARE NOT NOTICE OF DISCONTINUANCE.

Main Office: 253 Broadway (P. O. Box 1883), NEW YORK.

Telephone Number, 3,095 Cortlandt.

New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code.
London Cable Address—"PULCINETTO." " " " "

Branch Offices: **Chicago, Ill., Monadnock Building, Room 737.**
Denver, Colo., Boston Building, Room 206.
Salt Lake City, Utah, Walker Bank Building.
San Francisco, Cal., 207 Montgomery Street.

London, Eng., Office, 20 Bucklersbury, 368. E. Walker, Manager.

English subscriptions to the JOURNAL may be paid at the London office at the rate of £1 = £1 8s. 9d.; the publications of the Scientific Publishing Company may be bought at the rate of 4s, 2d. to the dollar, net.

CONTENTS.

	Page
Colorado Mineral Production	227
The Western Storms	227
Calumet & Hecla Dividends	227
Bessemer Steel Production	227
German Silver Sales in the East	227
Pig Iron Bounties	228
The Institute Meeting	228
Kentucky Coal and Coke in 1898	228
The Cumberland Coal Region	228
New Publications	229
Books Received	229
Correspondence	229
Alabama Mineral Production	229
Cleaning Blast Furnace Gases	230
New York Meeting of American Institute of Mining Engineers	230
*Fibrous Talc in St. Lawrence County, New York . J. Nelson Nevius	234
The Utilization of By-Products in Sweden	235
*The Latest Cyanide Plant in the Transvaal	236
A Recent Chlorination Mill	236
Railroad Rates on Iron in England	236
*Steam Stamp for the Tamarack Mill, Michigan	237
Wireless Telegraphy	237
Cast-Steel Locomotive Frames	237
Questions and Answers	238
Patents Relating to Mining and Metallurgy	238

* Illustrated.

Personal..... 240

Obituary..... 240

Societies and Technical Schools..... 240

Industrial Notes..... 240

Machinery and Supplies..... 241

Mining News.

United States:
Alaska..... 241
Arizona..... 241
California..... 241
Colorado..... 242
Florida..... 243
Michigan..... 243
Missouri..... 243
Montana..... 244
Nevada..... 244
New Hampshire 244
New Mexico..... 244
North Dakota.. 244
Oregon..... 244
Pennsylvania... 244
South Dakota... 244
Tennessee..... 244
Utah..... 244
Washington 244

Foreign:
Africa..... 245
Asia..... 245
Australasia..... 245
Canada..... 245
Europe..... 245

Markets.

Coal:
New York.... 246
Birmingham.. 246
Pittsburg..... 246

Roofing Slate:
Prices of..... 246

Chemicals and Minerals:
New York 246
Liverpool. 247

Metals.

Iron:
Pig Iron Production..... 247
Birmingham.. 247
Cleveland..... 248
Philadelphia.. 248
Pittsburg 248
Carthagena... 248
New York.... 248

Gold and Silver Prices, Statistics, Imports and Exports 249
Foreign Coins 249
Copper..... 249
Tin..... 249
Lead. 250
Spelter, ... 250
Antimony..... 250
Nickel..... 250
Platinum..... 250
Quicksilver... 250
Minor Metals. 250

Assessments.. 254

Dividends..... 254

Meetings..... 254

Mining Stocks.

Market Reviews:
New York.... 251
Boston..... 251
Salt Lake City 251
San Francisco 251
London..... 251
Paris..... 251

Late News.... 251

Stock Quotations
New York .. 252
Philadelphia.. 252
Pittsburg.... 252
Baltimore.... 252
St. Louis..... 252
Boston .. 252
Cleveland. 252
* Butte 252
Colo. Springs. 252
Denver..... 253
San Francisco 253
Rossland, B.C. 253
Valparaisc.... 253
Salt Lake City 253
Spokane 253
Toronto..... 253
Mexico..... 253
Shanghai..... 253
London..... 254
Paris..... 254

Mining Co.'s.
List of..... 255

Current Prices.
Minerals, Chemicals, etc 256

Advt. Index.. 17

Advt. Rates... 20

The metal production of Colorado in the calendar year 1898, as reported by Mr. H. A. Lee, the State Commisisoner of Mines, was by far the largest in the history of the State. The figures are as follows:

Gold, 1,138,657 fine oz., at $20.67	$23,536,050
Silver, 24,473,345 fine oz., at 58¼c	14,255,723
Lead, 118,368,264 lbs., at 3.63c	4,296,768
Copper, 12,537,646 lbs., at 12c	1,504,578
Total. . .	$43,593,059

A production of $43,593,059, to which is still to be added the value of the coal, coke, iron and other minor minerals, is one of which Colorado may well be proud. Moreover, there is every indication that these values will be equaled, if not exceeded, during the current year.

The heavy snowstorms from which Colorado has recently suffered may interfere somewhat with the production of the mines for January and February; but they at least secure abundant supplies of water for the balance of the year for placer work, and for other mining operations. The damage done in some districts is considerable, but in most cases it will not amount to much more than a temporary stoppage of work. The outlook, on the whole, is for an increase even over the great production of 1898.

In California there have been very welcome rains, and in the mountains some heavy falls of snow. This makes the prospect for the new year very much better than a year ago, when the second dry winter was making the supplies of water very precarious. Not only will placer and hydraulic mining be benefited, but in all the mines of Central and Southern California operations can be carried on actively. The probability is that the State will show a large advance in output over 1898, and may equal the excellent showing made in 1897.

The Calumet & Hecla Company this week declared a dividend of $10 a share accompanied by an extra dividend of $30 a share. This makes a total payment of $4,000,000; or adding the dividends previously paid it makes $7,000,000 paid during the company's current fiscal year. The rate is 280 per cent. on the company's capital stock of $2,500,000, taken at par value; but it is only about 8 per cent. on the current selling price of the stock, which is to-day $850 (ex-dividend) on the par value of $25 a share.

The payment of $4,000,000 at once is, we believe, the largest cash dividend ever paid by an American mining company. It is one of the largest—if not the largest—ever paid by a mining company anywhere. Certainly it is the largest ever paid by such a company out of current earnings.

Of course this dividend will be quoted everywhere by the speculators who are booming "coppers," especially by those who are promoting new companies. Not every copper mine is a Calumet & Hecla, however, as a good many Boston buyers of new stocks will find out after a time.

The American Iron and Steel Association's figures have now been collected and it is announced that the production of Bessemer steel in the United States in 1898 reached the great total of 6,609,017 long tons. This is by far the largest output ever reported; it exceeded that of 1897 by 1,133,702 tons, or 20.7 per cent., and that of 1896 by 2,689,111 tons, or 68.6 per cent. The extent of this output may be further realized when we say that last year we made nearly as much Bessemer steel as we did of pig iron in 1894.

Pennsylvania continued the chief maker of Bessemer steel, having turned out 3,402,254 tons, or over half the total. Ohio reports 1,489,115 tons, and Illinois 1,105,040 tons. These three States made 90 per cent. of the total. That is, the steel was made chiefly in the district which uses Lake Superior ores; and this again shows that as long as those ores constitute our main reliance, the Bessemer process will continue to hold the leading place in our trade.

The figures of production of open-hearth steel are not yet complete, but there was a large increase in production, and it is quite sure that our total output of steel in 1898 was 8,500,000 tons; probably over rather than under that figure.

The exports of silver from London to the East in January show a considerable decrease this year, the total value having been £641,880, against £738,765. To China there was a large comparative increase, the total being £225,380, against £114,271 in 1898; but the shipments to India and the Straits were £416,500, against £624,494. The value of the silver shipments from San Francisco to China showed a decrease of 16 per cent., the total for January last having been $710,937.

We may state that we have been informed that during the past year a considerable quantity of silver was sent from Germany to China direct. The shipments were made from Hamburg, and did not pass

through London. Owing to special arrangements for freight and insurance, an advantage was secured over the London silver dealers, and the metal was sold usually at a fraction below the price of the English dealers. The bulk of this business in the East was transacted through the Russian-Chinese Bank. Owing to the way in which the trade was conducted, it is impossible to ascertain its exact amount; but it is known to have been quite large. It is evident that the Germans have been getting rid of some of their surplus stocks of silver; but they are doing it as quietly and unobtrusively as possible, in order to avoid any disturbance of the market.

The bill which has been actively pressed in the Minnesota Legislature by Duluth and other interests, to provide for a bounty of 50 cents a ton on all pig iron made in the State, has failed to pass. It was strongly pressed by certain parties, who claimed that a large industry could be built up by using Lake ores at or near the mines, with fuel which could be brought up the Lakes at an extremely low rate of freight. The project has been urged for several years, but was brought to a vote this year for the first time.

Its failure is not to be regretted. The policy of bounties to any industry is always a very bad one. No permanent benefit can be expected from such attempts to change the course of trade for the benefit of particular persons or places. In fact, the final result is almost always an unfortunate one. The tendency in this country—and in most others also—is to carry the iron ores to the fuel, rather than the fuel to the ores; and that there are good reasons for this will readily appear to anyone who has studied the question carefully. A practical comment is found in the present condition of the blast furnace at West Duluth, and the steel works at Superior. If our Minnesota friends are wise, they will leave matters to take their natural course, and not try to get any further appropriations from the State. Just as soon as it is more profitable to make iron at the head of Lake Superior than at Pittsburg, or Cleveland, there will be plenty of capital forthcoming to do it; but this capital will not come on the basis of a subsidy.

THE INSTITUTE MEETING.

The meeting of the American Institute of Mining Engineers in New York this week was a very successful one so far as attendance and interest were concerned. There were 230 members registered as present, and if the number appearing at the sessions was comparatively small, the numerous outside attractions presented in a city like New York must be held accountable. Still the meetings were well attended and some of them notably so, where special papers were presented, such as Mr. Douglas' account of the Copper Queen Mine.

The arrangements for the meeting were very good and abundant opportunities were given to visit such points of interest as were to be seen. The trip to the New Jersey Zinc Company's mines on Friday gave engineers a rare opportunity to study the development of one of the most remarkable mineral deposits in the world.

The meeting was another instance of the impossibility of transacting all the business which ought to come up in the three days' gathering. Of the 41 papers noticed for this meeting very few could be read and fewer discussed. The majority were read only by title and many were not mentioned at all outside of the programme. The few verbal discussions were most interesting, but far too short, and it was impossible to extend them in the time allotted for the sessions. The consequence is that most papers are not discussed at all, and others only in writing. Now written criticisms have their place, and they are of much use and value; but they can never take the place of verbal discussion, when the contact of minds and the excitement of debate bring out points of opinion and experiences which would never be heard of otherwise. But this involves time at the meeting, which cannot be given under the present arrangements. Nor can the duration of the meetings be extended, since it is as a rule impossible for the active members to spare more time than they give at present.

The alternative seems to be in a vigorous limitation of the number of papers presented—which is so difficult as to be hardly feasible; and the division of the Institute into sections—which has been suggested before, but never had full consideration.

The New York meeting was, as we have said, an interesting and agreeable one. The election of Mr. James Douglas to the presidency was a well deserved tribute to an old and distinguished member of the Institute, who has always worked for its best interests and has contributed much to its records and to the honor of the metallurgical profession of the country.

KENTUCKY COAL AND COKE IN 1898.

Complete returns from all the commercial coal mines of the State for 1898 (except one small mine for the month of December, and it is estimated), as furnished us by Mr. G. W. Stone, the State Inspector of Mines, show a total production for the year of 3,542,132 tons. This is the greatest in the history of the State, and 238,079 tons in excess of the output of 1897, which was larger than that of any previous year. The year's production would probably have been 150,000 tons larger, but for serious strikes and suspensions of work in several localities. At the close of the year there were 95 companies working, employing a maximum force of 8,408 employees, and operating 128 mines. The cannel production of each year is included in the above amounts, but in 1898, when compared with 1897, this shows a loss of 6,621 tons in this product.

The tendency of the operators is more and more toward machine mining. Commencing with 1895, the following proportion of the product of each year was mined with machines: 1895, 26 per cent.; 1896, 30 per cent.; 1897, 41 per cent., and 1898, 43 per cent. There are 171 mining machines in use in the various mines; of these 122 are operated with compressed air, and 49 with electricity.

About 1,300,000 tons of the product were marketed outside of the State of Kentucky, as against only 32 per cent. of the 1897 output, showing a healthful growth on this important line.

As compared with 1897, there was a decrease in the production of coke of 10,891 tons.

The fatalities of the year among the employees were reduced to a minimum, there having been only six. This is the lowest number ever reported in any one year, except during 1896, when there were but six deaths also. But the production of 1898 is greater than that of 1896 by 359,654 tons, making the record of 1898 better than any in the history of the office. None of these deaths resulted from bad mine conditions, but from defective and careless operations. There were 43 noteworthy non-fatal accidents during the year, 24 of which are classed as slight and 23 as serious.

The prospect for a still larger yield the present year is excellent, and such expectations will most likely be realized, unless the work shall again be seriously hindered by strikes. No calculations can be made on the basis of strikes among the employees as such may be general, or merely local, and of long or short duration.

THE CUMBERLAND COAL REGION.

The Cumberland coal region in Maryland and the upper end of West Virginia in 1898 made a moderate advance in production, as it has done in each of several years past, in the face of the very sharp competition of its rivals. The statistics of this region are very fully kept, chiefly through the care of the Consolidation Coal Company, the chief operator in the region. In the table below we give the production and shipments for three years past:

Deliveries from mines:	1896.	1897.	1898
Frostburg Region	3,553,608	3,840,158	4,007,240
West Virginia Region	1,307,822	1,463,331	1,526,396
Totals	4,861,430	5.303,489	5,533,636
Shiments:			
Baltimore & Ohio R. R.	2,807,161	3,614,142	3,900,403
Pennsylvania R. R.	1,689,795	1,426,120	1,395,097
Chesapeake & Ohio Canal	364,474	263,227	238,136
Totals	4,861,430	5.303,489	5,533,636

In one respect this statement is not altogether correct, since local deliveries at Cumberland and other points are usually included in the shipments over the Baltimore & Ohio. The detailed figures for 1898 are as follows:

	Tons.
Shipments by Baltimore & Ohio R. R.	3,210,871
" " Pennsylvania R. R. direct	1,395,097
" " Penna. R. R., through Westernport	14,308
" " Chesapeake & Ohio Canal	238,136
Local sales and consumption	317,373
Converted into coke	357,851
Total	5,533,636

The coal shipped went chiefly to the eastward, the product of this region being consumed along the seaboard to a great extent. It has an established reputation there which secures it a steady market. The coke made in the region goes west, but very little of the coal.

The coke made was 238,817 tons, of which 207,008 tons were shipped over the Baltimore & Ohio Railroad, and 30,571 tons over the Pennsylvania Railroad, 1,238 tons being used locally. The coal used for coke was all from the mines of the Davis Coal and Coke Company in the West Virginia or Upper Potomac Basin, and the average yield in coke was 66.7 per cent. In the older, or Cumberland Basin proper, coke has not been made in any quantity.

The Cumberland region has been singularly free from strikes and labor disturbances, and in this respect no coal mining district in the country has so good a record. The mining work is comparatively light in the Big Vein mines, and the work steadier than in most coal mining districts.

NEW PUBLICATIONS.

"Report of the Governor of Arizona to the Secretary of the Interior for the fiscal year ended June 30th, 1898." Washington: Government Printing Office, 1899. Pamphlet. Pages, 179.

This is a statistical and descriptive account of the condition of the Territory during the last fiscal year. The population now numbers nearly if not quite 100,000, and the assessed taxable property amounts to $31,473,359. There are 989 miles of railroad in the Territory. The total indebtedness, including county and town funded debt and excluding cash in hand, is $2,630,288; the net territorial debt is only $873,599. The report refers to the agriculture, grazing, timber, water, transportation, climate and similar matters, but the most interesting portion is that prepared by Prof. W. P. Blake, territorial geologist, on the mining industry, which remains the predominating one. Prof. Blake discusses questions of general and economic geology and describes the mineral products according to kind and locality. More detailed reference to the mineral resources of Arizona is proposed to be made in a future issue of the "Engineering and Mining Journal."

"Education in Cuba, Porto Rico and the Philippines." By R. L. Packard. Extract from the Report of the United States Commissioner of Education for 1897-1898. Washington: Government Printing Office, 1899. Pamphlet. Pages, 74.

It may surprise those who have hitherto been impressed only by the statistics of illiteracy in Spain and the former Spanish colonies to learn from this report that the educational facilities in Cuba at least were far from insignificant during the Spanish rule. It is true that a very few availed themselves of these advantages. In the Province of Matanzas, for instance (where 55 per cent. were whites, and which, therefore, furnishes a more than fair example), the latest returns showed that over 60 per cent. of the white and 93 per cent. of the mixed and negro population could neither read nor write. But, on the other hand, we find in the curriculum of the University of Havana, besides elaborate courses in the "humanities," the following "general studies" in the scientific course. Mathematical analysis, geometry, analytical geometry, cosmography, advanced physics, zoology, botany, inorganic and organic chemistry, mineralogy, general geology, lineal drawing; under the head of "physico-mathematical" studies, differential and integral calculus, mechanics, descriptive geometry, experimental and higher physics, geodesy, theoretical and practical astronomy, drawing applied to physico-chemical-science and a close subdivision of other branches of natural science. Similarly the curriculum of the advanced preparatory schools embraced very practical studies. In his historical review Mr. Packard brings out the fact that the Spanish colonies produced a number of scientists, besides many prominent literary men.

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.

"Chemistry at the University of Tennessee." Knoxville, Tenn. Published for the University. Pamphlet. Pages, 8.

"Nutrition Investigations at the University of Tennessee." By Prof. Charles E. Wait, Knoxville, Tenn. Published for the author. Pamphlet. Pages, 16.

"The Journal of the Iron and Steel Institute." Volume LIV., No. 2, of 1898. Edited by Bennett H. Brough, Secretary. Published for the Institute. London: E. & F. N. Spon, Limited, and New York, Spon & Chamberlain. Pages, 624. Illustrated.

"Handbook of Metallurgy: Volume I.—Copper, Lead, Silver, Gold. Volume II.—Zinc, Cadmium, Mercury, Bismuth, Tin, Antimony, Arsenic, Nickel, Cobalt, Platinum, Aluminum." By Dr. Carl Schnabel. Translated into English by Henry Louis. London: Macmillan & Company, Limited, and New York, the Macmillan Company. Pages 876 and 732. Illustrated. Price $10.

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—M. N. S., of Cripple Creek, Colorado, makes a few remarks in your issue of January 28th suggestive to those connected with mining. Colorado and some other Western States are dependent entirely upon mining. These mines are foremost in the introduction of labor saving devices, but are frequently retarded in their use by lack of suitable men to run and keep the machines in repair. The uneducated mill man, mine foreman, mine manager, mine mechanic and miner are being placed on the shelf fast, and only those who are able to combine theory and practice can expect to get on in the future. Electricity in mining is comparatively new, and it offers so many possibilities for the future, it should be taken up and studied thoroughly. Text books on the subject are written with an eye to the writer's glory and not to teaching or imparting knowledge except to those who are nearly as well up in the subject as the writer. A few books throw in the rudiments and then skip to what may be called electrical engineering. The gap between is about what we want to fill up, and the united correspondence schools can accomplish it. There is no doubt that if M. N. S. and his friends form a class they will get along better, and suggestions upon other matters relating to their business would be beneficial.

Experience.

Youngstown, O., Jan. 31, 1899.

The Bower-Barff Rustless Iron Process.

Sir: We are amazed on reading your answer to "A. H. P." asking for information as to users of the Bower-Barff rustless iron process. We beg to inform you that the process is used more extensively than ever before in its history, and that in the majority of the buildings in New York and the cities of this country from the Atlantic to the Pacific, you will find that the cast and wrought iron work has been treated by the process. The following are some of our principal licensees: Hecla Iron Works, Brooklyn, N. Y.; Yale & Towne Manufacturing Company, Stamford, Conn.; Pratt & Cady Company, Hartford, Conn.; Winslow Brothers' Company, Chicago, Ill.; Chicago Hardware Manufacturing Company, Chicago, Ill.; L. Schreiber & Sons' Company, Cincinnati, Ohio; The Snead & Company Iron Works, Louisville, Ky. The following are the officers and directors of the company: S. V. White, president; R. W. Raymond, treasurer; Geo. W. Maynard, secretary; Peter Cooper Hewitt, Wm. T. Wells, Chas. E. Lydecker and Theo. Dwight, directors.

The process is so well established that we do not need to keep a standing advertisement in the papers, but you will find that our licensees without exception announce the use of the process in their advertisements or pamphlets. The calling in of your answer to "A. H. P.," for repairs, will be in order. The office of the company is No. 20 Nassau street, New York.

Geo. W. Maynard, Secretary.

New York, Feb. 21, 1899.

(We admit that the answer to A. H. P. should be amended. But this only shows the necessity of constant advertising. In our modern business there are so many competing concerns and processes that it is utterly impossible to keep them all in mind, or to recall their existence even. No concern is so important, nor is any process so well known and established, that it will not practically drop out of sight in a little while if it persists in hiding its light under a bushel, and does not advertise.—Editor E. & M. J.)

ALABAMA MINERAL PRODUCTION.

The reports collected and issued by Dr. Eugene A. Smith, State Geologist, give the following figures of production for the last quarter and the full year 1898:

	October.	November.	December.	Year.
Coal, short tons	572,016	609,954	586,538	6,509,223
Coke, short tons	143,993	141,941	139,428	1,390,254
Iron ore, long tons	179,900	176,951	178,934	2,202,158
Pig iron, long tons	87,495	87,798	87,233	1,026,459
Stone for flux, long tons	37,353	39,023	39,326	499,859
Bauxite, long tons	1,021	1,794	1,355	13,848
Lime, barrels	15,737	11,050	9,821	127,588

The reports received from producers cover in most cases about 90 per cent. of the total production, leaving only about 10 per cent. to be estimated, and this can be done very closely. The statements are therefore very nearly correct in their total figures of production. Statements of clay products are now being collected.

These monthly reports of production are very serviceable, and the State Geologist has done excellent and very acceptable work in collecting and publishing the figures. The example might well be followed in other States.

COAL EXPORTS OF GREAT BRITAIN.—The exports of coal, coke, cinders and fuel from the United Kingdom during January were 3,032,343 tons, as compared with 2,909,809 tons in January, 1898, and 2,763,954 tons in January, 1897.

RESTORING THE ILLUMINATING POWER OF INCANDESCENT LAMP MANTLES.—A recent number of "Neueste Erfindungen" contains an interesting account of an observation, made by Herr Franck, by which the illuminating power of the Welsbach mantles may be restored. The method was described by the author at one of the meetings of the Polytechnischer Verein in Berlin. As is well known, the mantles decline in illuminating power after they have been in use for some time. This luminosity may be restored to a certain degree by blowing out the mantle from the inside while they are burning, which can be accomplished with the aid of a small glass or paper tube. The president of the society stated that he had personally tested the method and had found it effective, and, in consequence, recommendable. In order to facilitate the carrying out of the process the German Incandescent Gaslight Company manufactures a tube, mounted in a rubber ball, which is very convenient for the purpose.

BELGIAN BY-PRODUCT COKE OVENS.—One of the most successful efforts in the direction of utilizing waste products, observes the "Moniteur Industriel," was that made by M. Semet, at the Bellevue Colliery of the Société des Charbonnages de l'Ouest de Mons, for recovering the by-products of coke ovens. The first trials were made with six ovens, after which the Solvay Company continued them on a larger scale with 25 ovens built near the Havré Colliery; and finally the owners of that colliery, the Société du Bois-du-Luc, took over the works and greatly extended them. In these ovens the combustion of the gases is so perfectly regulated that not only has all direct firing of the ovens with coal been suppressed, but even the firing is effected with only half the gas produced by the distillation, although the coals coked do not contain more than from 16 to 17 per cent. of volatile matter. The other half of the gas is sent directly under the boilers, or into the open air when the desired pressure is attained. The steam raised is more than sufficient for the works, the surplus being passed on to a neighboring department where the ammoniacal liquor is transformed into alkali or sulphate of ammonia. Thanks to this combination, it has been found possible to do away with the small furnaces which generally exist under recovery coke ovens; and what proves the remarkable extent to which the gases are utilized is the fact that only part of the 16 to 17 per cent. of volatile matters, from which 4½ per cent. of water and 1½ per cent. of tar must be deducted, are used for the operation of coking.

CLEANING BLAST FURNACE GASES.

The Theisen process for cleaning blast furnace gases is described by Herr Zimmersbach in a recent paper. The idea of utilizing the waste gases for power purposes, the saving of the by-products in coking, and, the reviewer predicts, the enforcement of city ordinances to abate the dust and smoke nuisance where blast furnaces are within town limits, all combine to subject new devices and processes in this line to close scrutiny. It is impossible to settle out the dust in blast furnace gases by quiet storage, for the quantity is too great. The Theisen process uses a centrifugal scrubber, which brings the gases into intimate contact with the cooling water and takes out the very finest particles of dust with ease. An artificial draft is created by the mechanism corresponding to 1 to 1¾ in. water, the gases traveling at the rate of 150 to 200 ft. a second. The water which has taken up all the dust is drained into a settling basin and used over again. The apparatus being very efficient can be of comparatively small dimensions. Thus if it is 7 ft. high and 8 ft. in diameter 10,600 cu. ft. a minute will be taken care of. The old style scrubbers, which were very large and not nearly as efficient as this apparatus, cost about $8,000 to $10,000, and therefore made the installation of a large plant a very expensive matter. As this centrifugal scrubber not only pushes the gas along, but also sucks it in, special exhaust engines can be dispensed with. The idea is to mix thoroughly very thin layers of the gases with the water or lye. For saving by-products it is found that the tar is first thrown out of the gases, and in so doing it serves to help catching the succeeding particles. In the next drum of the apparatus the use of special fluids promotes the enriching of the ammonia water. Cooling towers are not necessary, as the tar is completely removed and, moreover, it is nearly free from water on account of the initial high temperature of the gases at the place of separation. Benzol is washed out in a similar manner.

NEW YORK MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

Although the exercises of the twenty-ninth annual meeting in New York did not begin until Tuesday, February 21st, a number of members, who had reached the city in advance, attended, by special invitation, a meeting of the Geological and Mineralogical Section of the New York Academy of Sciences and listened to an address by Prof. J. H. Kemp on "Titaniferous Iron Ores." Prof. Kemp described the chemical composition of these ores at length and their association with igneous rocks. He mentioned their occurrence in Quebec, the Adirondacks, Rhode Island, North Carolina, Minnesota, Wyoming, Colorado and in Norway, paying especial attention to the great ore bodies of the Adirondacks. He discussed briefly the probable mode of origin of such ores in a fluid magma. Regarding their utilization, he said that so long as high phosphorus ores from Alabama and low phosphorus ores from Lake Superior could be had as cheaply as now, probably little would be done with them, but they formed immense reserves for the future. The peculiar suitability of titaniferous ores for drilled castings, he thought, was very likely due to small proportions of chromium, vanadium or other elements, the influence of which on pig iron has been little studied, quite as much as to the titanium. He mentioned also the experiments made by Mr. A. J. Rossi on the smelting of titaniferous ores.

The programme for the meeting was as follows:

February 21st.—10 a. m., headquarters at Murray Hill Hotel. 8 a. m., opening session. Paper, illustrated with lantern views, on "The Copper Queen Mine," by James Douglas. Also a few slides were shown on Peruvian mining operations by Mr. E. E. Olcott.

February 22d.—Morning and afternoon exercises opened at Columbia University with an address of welcome by Prof. H. S. Munroe, followed by a session of the Institute and the inspection of the buildings and grounds of the University. Papers by Messrs. Parker and Moses at this session were illustrated by lantern slides. Prof. J. F. Kemp gave a description, also with slides, of the zinc mines to be visited by the Institute. (This paper will not be published.) A lunch, tendered by the New York Committee, in the University lunch-room at a convenient hour. At 8:30 p. m. a reception and dance occurred at Sherry's.

February 23d.—At 10 a. m. a session of the Institute was held at the hall of the American Society of Mechanical Engineers. In the afternoon Mr. and Mrs. Abram S. Hewitt tendered a reception at their residence, No. 9 Lexington Avenue. There were also two excursions in the afternoon; No. 1 was to the new East River bridge and the Brooklyn Navy Yard. This excursion started from the hall of the American Society of Mechanical Engineers. Visits were also paid to the Hecla Iron Works, Brooklyn, and to the Worthington Pump Works, Brooklyn. Excursion No. 2 consisted of a visit to the Nichols Chemical Works, at Laurel Hill, L. I., at which a luncheon was tendered the visitors.

February 24th.—In the morning and afternoon an excursion was made to the mines and concentration plant of the New Jersey Zinc Company, at Franklin Furnace, N. J. This excursion was in charge of Mr. H. A. J. Wilkens. The evening was free for theaters, etc.

February 25th.—Excursions were offered to the works of the New Jersey Zinc Company, Newark, N. J., and to the Guggenheim Smelting Works, at Perth Amboy, N. J. The local excursions consisted of visits to the Brooklyn Bridge; the J. L. Mott Iron Works; the power-house of the Third Avenue Railroad Company, at 65th Street and Third Avenue; Tiffany & Co., Tiffany Glass Company; power-house of the Metropolitan Street Railroad Company; Edison Electric Illuminating Company's power-house, at 53 Duane Street; Ball & Wood Company's Works, at Elizabethport, N. J.; Atha & Illingworth Company's steel works, at Harrison, N. J.; Crocker-Wheeler Electric Company's works, at Ampere, N. J.; the Joseph Dixon Crucible Company's works, in Jersey City.

The local Reception Committee consisted of Charles Kirchhoff, Abram S. Hewitt, Henry M. Howe, Andrew Carnegie, Thomas Robins, Jr., L. W. Francis, James Douglas, R. W. Raymond, William E. Dodge, W. A. Clark, W. B. Kunhardt and Theodore Dwight. The General Committee was made up of Edward Cooper, W. S. de Camp, August Heckscher, A. C. Humphreys, D. S. Jacobus, G. F. Kunz, A. R. Ledoux, H. S. Munroe, De Veaux Powell, R. P. Rothwell, E. G. Spilsbury, Frank S. Witherbee, A. Eilers, H. S. Drinker, L. Holbrook, C. W. Hunt, J. F. Kemp, J. Langeloth, Frank Lyman, A. L. Norrie, J. B. Randol, A. J. Rossi, W. H. Wiley and J. A. Walker. The Excursion Committee comprised E. E. Olcott, H. A. J. Wilkens, James B. Tonking, James Douglas, William P. Hardenbergh and Joseph A. Van Mater.

In addition to the list of papers which was given in the "Engineering and Mining Journal" for February 18th the following papers were received for presentation at the meeting:

32. "Correspondence Schools," by R. P. Rothwell.
33. "The New Laboratories of the Department of Mining and Metallurgy," by John Bonsall Porter.
34. "Iron Ores of the Potsdam Formation in the Valley of Virginia," by Charles Catlett.
35. "Peculiar Crystalline Forms of Gold," by George F. Kunz.
36. "Elkhart Dressing Works, at Chloride, Arizona," by George W. Maynard.
37. "The Geological Structure of the Rocky Mountains Within the Lewis & Clarke Timber Reserve, in Montana," by Robert Hollister Chapman.
38. Discussion of Scott's paper on the "Evolution of Mine Surveying Instruments."
39. Biographical notice of Oberberghauptmann Dr. Albert L. Serlo, by Prof. Dr. Hermann Wedding.
40. "Mining Laboratory of Columbia University," by Henry S. Munroe.
41. "Metallurgical Laboratory of Columbia University," by Henry M. Howe.

The headquarters in the Murray Hill Hotel were a busy place on the first day of the meeting, Tuesday, February 21st. The number of members that arrived from out of town during the day proved to be unexpectedly large. The total number of members that registered during the day and evening was fully 230.

The opening session was held in the evening at the rooms of the American Society of Mechanical Engineers. President Kirchoff occupied the chair, and Dr. R. W. Raymond acted as secretary. A committee of three scrutineers was appointed—Dr. George W. Maynard, Mr. E. W. Parker and Mr. H. Van F. Furman—to take charge of the balloting for officers for the coming year. Dr. Raymond announced that the council had decided to accept the invitation of the California State Miners' Association, to hold the next meeting in San Francisco. Details will be furnished members during the summer, and the session will probably be held early in October next. A cordial invitation had been received also from the Canadian Institute of Mining Engineers, to hold the next meeting in British Columbia. It was suggested that members desirous of going might start for Montreal about September 1st, and spend a month traveling through the different mining districts of British Columbia.

A "Biographical Notice of Oberberghauptmann, Dr. Albert L. Serlo," written in German, by Prof. Herrmann Wedding and others, and translated into English by Dr. Raymond, was presented. The room, unfortunately, proved rather too small to accommodate with ease all those who wished to hear Dr. James Douglas' very interesting description of the Copper Queen Mine at Bisbee, Arizona. Dr. Douglas stated that the Copper Queen Mine was discovered before 1880, but little or no work had been done upon it. A large outcrop of ferruginous copper ore on the side of a mountain dipped at a steep angle into it. This outcrop was so remarkable that it seemed probable there were others in the country limestone. The outcrop, as shown by an open cut when mining began, was about 60 by 60 ft., and was the only outcrop of that large series of ore bodies that have yielded so much copper. An incline started east of the open cut and entered the ore body between the second and third levels of the mine. It developed what was found to be an isolated ore body which yielded between 1880 and 1884 about 200,000,000 lbs. of copper. The company, after drifting east over 400 ft., and finding nothing, was about to abandon the mine, as the Neptune Mining Company had also found no ore after much work. But in the summer of 1884 another big ore body was uncovered between 400 and 500 ft. by the Copper Queen and Atlanta companies, simultaneously. Since then developments have extended over other properties purchased at sheriff's sale, but as yet no valuable ore has been found, except in the upper limestones. These limestones are comparatively limited in extent, being bounded on the east by feldspathic rocks, granites and rhyolite. In the limestone, however, along its contact with the feldspathic rocks, are all the copper ores yet discovered in workable quantities..

These feldspathic rocks carry no copper of any consequence. The upper limestones alone have been worked properly, as they carry the large masses of oxidized and unoxidized ores. The lower limestones are impregnated with iron pyrites, with a sparse amount of copper pyrites, and these deposits are being developed now.

The Copper King and Cochise Mining companies are sinking and looking for ore in the feldspathic rocks. The ore deposits circle around the Copper Queen hill and lie in large quantities under the flats near Bisbee. Another line of deposits is represented by a gully back of Copper Queen and Copper King hills. No ore of consequence has been found in the heart of the hill. The largest ore body discovered, which gave single stopes of 200 by 250 ft., was about 1,000 ft. from feldspathic rocks. In a sense, therefore, the ore bodies are contact deposits; in another sense, they certainly are not.

The line between the limestones and feldspathic is not sharp as the limestone near the contact, as a rule is greatly decomposed, forming a sort of transition zone. The ore deposits seem to be arranged without any order in the limestone. Those first discovered were completely oxidized. The present ores are mixed more or less with sulphur, but there is no clear line of demarkation between the oxidized and unoxidized ore. On the 200 ft. level of the Czar shaft, there is the apex of an immense body of partially altered and unaltered sulphide ore, containing probably 1,000,000 tons. But at the same time about 500 ft. below that level occur ores that are almost entirely altered. The altered ores are, of course, most interesting to study. The ore bodies are generally found in ledge matter. This is a ferruginous clay, which is often distinctly stratified. In places it carries copper, but about 99 per cent. of it does not carry more than a trace. The copper is sometimes disseminated in fine

*"Stahl und Eisen," January 15, 1899.

particles of carbonate of sub-oxide in the clays, but more generally it occurs as cuprite, in compact masses of limonite, sometimes of very large size, imbedded in the clay. The very rich specimens of carbonate of copper, for which the mine is famous, occur generally in the clays, close to the limestone. At times the ore occurs as metallic copper, generally in a yellow, sandy clay. These masses of native copper occur at the bottom of the great pockets of ledge matter and seldom at the top. The sulphide ore masses may occur at different levels in the ledge matter.

A solid sulphide body in the Czar shaft at the 200 ft. level reaches over 2 acres and extends down to the 400 ft. level. Its outer shell contains much black oxide of copper, but the unaltered sulphide within is too poor to pay in Arizona. Regarding the origin of the ores it was first supposed that they filled pre-existing cavities in the limestone, and the occurrence of caves in many parts of the mine strengthened this belief. Some of these caves are very beautiful. The limestones also are fissured to depths of 400, 500 and 600 ft., and these fissures often contain ledge matter, with more or less copper. Close study shows the ore bodies have been formed by replacements in the limestone. There seems to have been an actual movement of silica and alumina from the feldspathic rocks into the limestone, thus forming the ledge matter of the ore chambers and shoots. The copper originally was present as sulphide in large bodies of iron pyrites. The content of copper in these pyrites is often as low as 2 per cent. By the oxidizing of the sulphides and action of the waters percolating through the limestones, a complex series of chemical changes has resulted in the present conditions. Drifts sometimes show 88 per cent. carbonate of lime in the limestone roof, while the clay floor has but a trace. Generally, whenever a cave is struck, it is known an ore body exists below. Consequently, in prospecting on the surface a depression in the limestone anywhere showing that the rock there is more or less decomposed, is taken as a sign that an ore body may be found by sinking. The original furnace was a 30-in. water jacket. With the increased output and economies made necessary by lower grade ore and lower prices for copper, the plant has been enlarged several times and the process much improved. Furnaces 120 by 48 in., with tipping wells and directly connected to trough converters are now used. The trough converter was introduced in this country by the Copper Queen Company from Italy. It has since been put in at Clark's United Verde Mine, and at the Arizona Copper Company's works, while the Butte & Boston Company will use this type in its new smelter. Since 1895 the company has made matte by using oxide and sulphide ores in about equal portions. The capacity of the present pumping plant is 3,000,000 or 4,000,000 gals. per diem. This large capacity was made necessary by the occasional floods, which readily penetrate the fissured limestones. The equipment is now so complete that ore mined in the morning can be shipped as matte by the evening of the same day. Mr. Douglas extended a cordial invitation to the Institute to visit the property when going to or returning from the San Francisco meeting. After Mr. Douglas had finished, the secretary stated that the members of the Institute were invited to visit the New York Press Club, the Uptown, the Reform and the Lotos clubs, while in the city.

Mr. E. E. Olcott then described some lantern slides, illustrating "Peruvian Mining." The views were taken in 1891, when Mr. Olcott was making an examination of the gold bearing gravels of Peru, notably those of the Sandia Gold Fields. These gold fields were described in the "Engineering and Mining Journal" May 8th and 15th, 1897. After the session refreshments were served to the members and their guests.

The sessions on Wednesday, February 22d, were held in Havemeyer Hall, at Columbia University. Prof. H. S. Munroe opened the morning session welcoming the members of the Institute in behalf of the University. He mentioned the salient points of interest about the new buildings, saying that they were planned to accommodate 4,000 students. He stated that the whole value of the plant of Columbia University, including the medical school, is probably somewhere in the neighborhood of $8,000,000. The endowments, etc., amount to about $10,000,000, while about $2,000,000 more has been settled. President Kirchoff then gave his annual address, discussing the reduction of costs in different branches of metallurgy during the past decade. Tabulated statements of the cost of producing iron and steel at several leading plants in the East, South, at Pittsburg and in the Middle West were given. Diagrams were shown also of the fluctuations in the selling prices, cost of labor, etc., at several plants. Mr. Otto A. Moses then read his paper on "The Lay System of Hydraulic Placer Mining." This system has already been described in the "Engineering and Mining Journal" of July 23d, 1898. Mr. Moses stated that it has been demonstrated that this system has saved 95 per cent. of the gold in a placer. This paper brought out an interesting discussion as to the practical working of the Lay system at present; its adaptability to regions where fuel is scarce and high; where placer banks are from 100 to 120 ft. deep; its cost of operation, etc.

Dr. Raymond thought that the weakest spot in the system was the riffles, and questioned the ability of a device a few feet long to catch as much gold as a sluice several miles long. In replying to inquiries, Mr. Moses said the system must be located where fuel can be had. In regard to breaking down high banks he thought several small nozzles well directed, as effective as one large stream, and pointed out that in regular hydraulic mining a large volume of water was necessary to transport material dislodged, which in the Lay system was separated at once.

Prof. Field stated that he thought the system well adapted to countries like Guiana, where the gravel banks are not high, and the values sometimes run as high as $1 per yard, as, for instance, in the Klondike. In Guiana the gold is not very fine, but is in nuggets from the size of a pin head up, with sharp faces, and in sluicing most of the gold is caught within 10 or 12 ft. from where it is thrown in. He was inclined to doubt the ability of the Lay system to recover gold when very fine, as in some Southern Utah deposits where it took 2,400 colors to make 1c. in value.

Dr. Moses, however, thought that the action of the centrifugal pumps made the fine gold more liable to be caught, than when dumped into a large and swift running current of water.

Mr. Henry M. Howe then read a paper on work in a "Metallurgical Laboratory"; Mr. John Bonsall Porter added a few facts about the McGill University laboratory. Lunch was served in the University dining rooms and after lunch many members visited the University laboratories, workshops and museums in Schermerhorn, Havemeyer and the engineering building.

Prof. J. F. Kemp opened the afternoon session with a very clear description of the zinc ore deposits at Stirling Hill and Franklin Furnace, N. J., which the members of the Institute were to visit on the following day. Prof. Kemp discussed the probable age of the limestones in which the ore occurs, the character of the ore bodies and the great variety of associated minerals. A plaster model made several years ago by Mr. Frank L. Nason, showing the shape of the big ore body at Franklin Hill, was exhibited.

Following Prof. Kemp, Prof. H. S. Munroe spoke of the mining laboratory at Columbia University. The laboratories will include one for mechanical assays, containing small crushers, rolls and screens, and conveniences for sampling, hand picking, jigging ore and for panning gold bearing gravel. The second laboratory, in process of construction, is intended for testing small lots of ore. The third laboratory contains the ore dressing machinery. In this it is intended to use a few full sized machines of standard types, so arrange these that a small amount of ore can be pumped back and used over again and again.

The closing paper of the day was by Mr. Robert H. Chapman, on "The Geological Structure of the Rocky Mountains, Within the Lewis & Clarke Timber Reserve, in Montana." The topography of the region and the character of the underlying rocks were discussed. The region is of interest as carrying the same shale and limestone formations that carry copper to the north of it. Parallel faults with visible throws of 100 ft. make sharp pointed rows of peaks, with precipitious cliffs. Travel is difficult and the region has not been prospected much.

In the evening many of the members with their wives and friends attended a dance at Sherry's.

On Thursday, February 23d, the third session of the meeting opened at the rooms of the American Society of Mechanical Engineers. The subject taken for discussion was the Kytchtym medal. Dr. Raymond read the written discussions given below. He also showed several very fine iron castings, with impressions. In the verbal discussion that followed Mr. Kent stated that in his investigations he found that cast-iron was about the best metal for making good castings; it is better than bronze. He also contended that it was a question of moulding rather than the metal. Then followed Mr. Charles Catlett's paper on "The Coking in Beehive Ovens, of the Coals of the New River District, West Virginia," an abstract of which is given below.

The next paper taken up, which called out an interesting discussion, was "Important Results Obtained in the Past Fifteen Years with the Stiff and Heavy Rail Sections," by Mr. P. H. Dudley. This paper was illustrated by diagrams in print and on the blackboard by Mr. Dudley. An abstract will be found below.

During the discussion that followed, in which Messrs. Raymond, Kent, Fritz, Birkenbine, Howe and Miller participated, it was claimed that low atmospheric temperatures had much to do with the brittleness of rails. In this connection Dr. Raymond made reference to the action of liquid air. He learned recently that iron or steel immersed in liquid air would become brittle, this condition lasting a short time after they had been taken out of the liquid. But the iron and steel would eventually assume their former hardness. He also stated on good authority that copper and some of the other metals are not so much affected as iron and steel after immersion in liquid air. The stresses of rails were also discussed by Mr. Howe, and in reply Mr. Dudley said that the heavier the rail the less will the effect of the stress of trains be noticeable. Heretofore, Mr. Dudley had spoken of rails under 100 lbs. upon which he had carried on experiments. Later he stated that the heaviest rail now in use in this country on steam railroads is 105 or 107 lbs. He also added that the mills were not in a position to make a 120-lb. rail, as was suggested by one of the members present. Mr. Fritz, however, was quick in responding, and stated that larger rails can be made if the consumers will pay for them. He added that the higher cost is chiefly for quality of the material used in making such large sections.

The meeting adjourned about noon.

In the afternoon of Thursday many of the members visited the works of the Nichols Chemical Company at Laurel Hill, L. I., where they were shown through the Bessemer plant and the cupola and calcining furnace department, besides other parts of the works. An elaborate luncheon was served. Other members of the Institute took the excursion to the new East River Bridge and the Brooklyn Navy Yard, also visiting the Hecla Iron Works in Brooklyn, where are manufactured various articles of architectural and ornamental design in iron, sheet brass, bronze, copper, aluminum and spelter. Here a visit was paid to the modeling department, the metal foundries and ornamental blacksmithing department, and to the galvano bronze deposition and Bower-Barffing sections. The Worthington Pumping Engine Works were also visited, and here were shown some of the largest and best constructed machines made by the company and which are in use in different parts of the world.

At the meeting on Thursday evening, Dr. E. W. Parker read a paper on "Coal Cutting Machinery." After stating that in 1891 541 coal cutting machines were at work in the United States while in 1897 there were 1,198 machines and the output had increased to 22,649,000 tons, he said that the introduction of machines was not uniform among the coal-mining States. Pennsylvania though having fewer machines at work in 1897 than Illinois had adopted them more rapidly in the last few years. This was because Illinois was the first State to use machines on a large scale, and as the first machines built were not durable and efficient as those made now, Illinois mining men became somewhat prejudiced against them.

The first patent taken out on a coal mining machine in this country was in 1858, but the first pick machine to do work, the Harrison, was not patented till December, 1878, though the Jeffrey Manufacturing Company patented a cutter-bar machine in 1876. The first air driven machines brought out were built too lightly, could not be controlled closely and had to overcome the hostility of the miners. Machines driven by elec-

tricity were made in 1879. Cutter-bar machines have generally been discarded, as they are much less economical than those of the types in most frequent use, the pick and the chain breast. This last was brought out simultaneously by three companies in 1894. Some long-wall machines are manufactured, but chiefly for export, as the long-wall system of mining is comparatively little used in this country. Regarding the effectiveness of machines Dr. Parker thought there were few bituminous mines with level seams or seams having low dips where machines could not be used to advantage. A dip over 12° makes machine mining hard, but some machines with self-hauling trucks can work in seams with dips as high as 14°. The best saving is made not by giving the machines to experienced hand miners but by instructing green men in their use. This paper was illustrated by lantern slides. A short discussion followed, chiefly in relation to the insulation of electric wires in mines to avoid danger from sparks and the ignition of gases. Dr. Raymond then announced that as the hour was late no other papers would be discussed. He stated that Prof. W. C. Roberts-Austen of London, and Prof. F. Osmond of Paris, had been recommended as honorary members. They were unanimously elected.

The election of officers for the coming year by letter-ballot was then announced as follows: President, James Douglas, New York. Vice-presidents, E. C. Potter, Chicago; G. F. Kunz, New York; W. N. Page, Ansted, W. Va. Managers, Arthur Winslow, St. Louis; W. Glenn, Baltimore; W. J. Taylor, Bound Brook, N. J. Theodore D. Rand was re-elected treasurer and Dr. R. W. Raymond, secretary.

Mr. Douglas in a few words thanked the members of the Institute for the honor conferred on him and promised to do his best to deserve it. Mr. John Birkenbine in a short address moved a vote of thanks to the local committee that had contributed so much to the pleasure of visiting members, and the resolution was unanimously adopted. The secretary then announced the Institute adjourned till the fall meeting in San Francisco.

The morning and afternoon of Friday, February 24th, had been set aside for a visit to the mines of the New Jersey Zinc Company at Stirling Hill and Franklin Furnace, N. J., while the evening was left free for social purposes, visits, etc. The excursion was well attended, the local committee having provided special accommodations on a train leaving New York at 9.15 a. m. A large number of ladies were in the party.

We give below abstracts of several of the papers presented at this meeting.

The Rich Patch Iron Tract, Virginia.

By H. M. Chance.

In this paper the author describes the topography and geology of the Rich Patch Tract, which includes about 9,000 acres in Alleghany County, Va., adjoining the Low Moor tract. This property produces red hematite, or fossil ore, and brown hematite, or Oriskany ore. The former is found in veins from 3 to 5 ft. thick; the latter in two veins, or beds, of which only the lower one is worked. This varies from 10 ft. to 45 ft. in thickness. The practical development of this tract began in 1890, and a number of openings have been made.

The method used in extracting this ore is that commonly used in the region in mining brown-hematite ore under cover. The levels are driven close together, connected by up-raises which are used as chutes for loading the ore into cars on the main drift or car-level below, and each drift is robbed back from the boundary by withdrawing or blasting down the timbering, allowing the overlying material to fall behind, as fast as robbing progresses. By this method practically all of the ore is extracted, none being left in pillars, as is done in other styles of mining. This method has reached its best development in this district, on this property, and notably at the adjoining Low Moor property and at Longdale, where the same vein is mined.

The method of preparation is capable of material improvement without increasing the cost of the ore, and without involving a large additional outlay for plant. The ore is largely lump-ore, which requires no preparation. A variable percentage of the output is so-called "wash" ore, which consists of fine particles of ore ranging in size from wheat-grains to fragments 2 or 3 in. in diameter, and containing a little clay and sand, which are removed by washing in revolving cylindrical washers. The clayey matter dissolves easily in water, and the ore is washed quickly and effectively by the apparatus in use. It is evident that this apparatus does not remove particles of coarse sand, fragments of flint, sandstone and other impurities which may exist in the ore. Properly to prepare this ore for furnace-use, these impurities should be removed by jigging the ore, as is commonly done in many of our brown-hematite ore districts. The addition of jigs would not only increase the percentage of iron in the ore as shipped, but would also materially decrease the percentage of silica; it would also make it possible to utilize some lump-ore which is occasionally rejected because particles of flint or quartz are imbedded in the lumps, and which in the aggregate amount to a considerable quantity. This material should be crushed and jigged, and the washed product added to the washed ore.

The average of wash-ore shows about 60 to 80 per cent. of ore, or a loss in weight by washing of from 15 to 40 per cent., varying, of course, with the amount of clay and other impurities, such as sand, decomposed slate, etc., which it contains.

Corundum in Ontario.

By Archibald Blue, Toronto, Canada.

Here the author describes the recent discoveries of corundum in Ontario, and compares its occurrence there with those in the Appalachian Belt in the United States. He suggests the use of the mineral as an ore of aluminum, and describes a number of experiments made in treating and concentrating at the Kingston School of Mines, where Prof. DeKalb succeeded in extracting corundum 99.6 per cent. pure from rock that carried 5 per cent. of magnetic iron ore. The use of the material in making aluminum would add greatly to the value of the deposits.

None of the discoveries hitherto made in Ontario seem to encourage the hope that gem-varieties of the corundum are to be found, although, in some localities, an occasional crystal is to be seen with qualities not unlike sapphire, being semi-translucent and of bluish color. Perhaps, if search were made in the crystalline limestones, it might be rewarded with better success; not that corundum of any quality has yet been found in the limestones, but because their relations to the gneiss are not dissimilar to those which obtain in Burma. When the source of the limestones has been worked out, it may be shown that, like those of Burma, they have been derived by metamorphosis from the feldspar of the gneiss, or perhaps from the feldspar of the syenite; and if so, the analogy would suggest that these rocks are worth prospecting for corundum in some of its more valuable forms. The crystals discovered by Sterry Hunt in Burgess, it will be remembered, were found in association with pyroxene in crystalline limestone.

In view of the extent and apparent richness of the corundum fields in the Province, the Government has taken steps aimed at developing the deposits and establishing a home industry. Regulations have been drawn up, under which the mineral rights in lands lying within the two corundiferous belts have been withdrawn from sale, and hereafter the mineral and mining rights in such lands can be acquired only under the leasehold system—the rental for the first year being 60 cents, and for subsequent years 15 cents per acre. Instead of allowing speculators to take up and hold lands with a view to sell out their interests to miners and capitalists at a large profit, it is proposed that the advantage of acquiring lands upon the lowest terms shall go to the miner and manufacturer direct; and in the case of parties who will undertake to conduct mining and treating operations on the largest and completest scale, and who can furnish satisfactory assurance that they possess the requisite capital for the proposed operations (including separation of the ore from its gangue, milling for abrasive uses, manufacture of abrasive goods, and the production of aluminum), the Government may concede a preference in the selection of mineral lands. It is also provided that the Government shall have power to require that all corundum mined from lands leased under the regulations shall undergo certain processes of treatment and milling at works to be erected in the Province to prepare it for market; and may further require, from time to time, as circumstances appear to warrant, that works be established in the Province for the manufacture of all useful or commercial products for which the mineral or ore is economically adapted.

Oberberghauptmann Dr. Albert L. Serlo.

By Prof. Dr. Hermann Wedding, Berlin, Germany.

Albert Ludwig Serlo was born February 14th, 1824, at Crossen-on-the Oder. After completing his school studies and his training as a mining official, he received, in 1851, an appointment as royal manager of Salt Works and member of the Administration of Salines at Königsborn, Westphalia. The issue of new regulations for the training of higher State officials in the Department of Mining and Metallurgy led him to pass, in 1856, a special examination for the rank of assessor, in consequence of which he was called to Berlin to serve for a few months as an assistant in the Ministry of Commerce, which had charge of mining, etc. In the same year he became bergmeister and member of the mining administration at Bochum, Westphalia, and in 1858, oberbergrath and member of the provisional administration, called the oberbergamt, having its headquarters at Dortmund. In 1861 he was appointed director, and the head of the newly reorganized mining administration of the important governmental coal mining district of Saarbrucken.

From this period dates his fame as a mining official. It was in 1860 that Krug von Nidda, a man who played a very important part in the mining and metallurgical affairs of Prussia and of Germany, took control as oberberghauptmann of the Prussian mining administration. To him those interests owe their deliverance from fettering limitations, and the consequent advance in Germany. Serlo was one of the few who, from the first, correctly appropriated and put into practice the principles of Krug von Nidda. By so doing, he made the State collieries at Saarbrucken a pattern.

After a temporary service at the ministry in Berlin, he was sent, in 1866, to Breslau, as director of the oberbergamt there, and in this new position he carried out again, with brilliant results, the ideas of Krug von Nidda. The period passed in Berlin exercised a decisive influence upon his literary work, and laid the foundation of fame beyond the limits of his native country. At this time he undertook, upon the death, in 1866, of Lottner, the first director of the Royal Academy of Mines, founded by Krug von Nidda at Berlin, to arrange and edit for publication Lottner's lectures on the art of mining. The first edition of this work appeared in 1868, after Serlo had assumed his post at Breslau. It has passed through several editions since, and still maintains its position as a leading treaties on the subject.

After the death of Krug von Nidda, in 1878, Serlo succeeded to the office of oberberghauptmann and director of the Prussian Department of Mining, Metallurgy and Salines. In this position, besides an efficient and progressive administration, Serlo achieved a work of lasting importance by creating the commission for the investigation and remedy of the dangers due to fire-damp in coal mines. As the president of this commission, and an active participant and guide in its work, which resulted in the promulgation of rules and precautions now followed in nearly all countries, he deserves to be regarded as a benefactor of colliery workmen throughout the world.

Unfortunately, it was not long before an insidious spinal disease began to destroy his ardent enjoyment in his work, and in 1884 it forced him to retire from active service. In spite of the severe sufferings which made him physically a cripple, he lived for years, under the devoted ministrations of his wife, in undiminished mental vigor.

Serlo's distinguished achievements in the formost German mines and metallurgical works, and his masterly recension of Lottner's "Bergbaukunde," have assured him a place among the great exemplars and leaders of the profession. It was his good fortune to know, during his lifetime, that his merits were universally recognized, as was abundantly evidenced by the numerous orders and honorary memberships which were bestowed upon him. Among the latter none gave him deeper gratification than his election as honorary member of the American Institute of Mining Engineers.

Results with Stiff and Heavy Rail Sections.

By P. H. Dudley, New York City.

It is hard to realize that it lacks a few months of 15 years since the pioneer 5-in. 80-lb. rail for the United States was laid by the New York Central & Hudson River Railroad Company, in July, 1884, on the Harlem Division. Since then there has been a steady increase in weight of locomotives and cars, in length and speed of trains, both passenger and freight.

There seems to be no prospect of a decrease in static wheel-loads and in the speed of trains. On the contrary, both are increasing, and the severer requirements of service must be met largely by applying principles now well known to prevent the generation of large destructive dynamic forces under the moving trains, and by raising to a higher efficiency, in an economical way, everything which appertains to transportation. The loads under moving trains, which the rails and road-bed must sustain, are the combined effects of the static wheel-loads and the generated dynamic effects, the latter often excelling the former. One of the great advantages of the recent stiff rails, as factors in the higher standard of track obtained, has been not only to check the generation of so large destructive dynamic effects from the static loads, as was the case on the lighter roads, but, after that, to distribute the reduced load over larger areas of the road-bed. In other words, the heavier static loads with the lessening dynamic loads are not so destructive to the ties and road-bed on the stiff rails as was the case with lighter static but greater dynamic loads on the weak rails. This important fact is proved conclusively by the higher standards of track attained on the heavy rails, though under a greater volume of traffic.

The author then goes on to give a large number of instances drawn from experience with heavy rails. In conclusion, he says:

"Twenty-three years ago I reported to the Institute that I found the resistance per ton of freight trains of 25 to 30 cars (gross load 600 to 700 tons) to be 6 to 8 lbs. per ton on light steel rails, at speeds of 18 to 20 miles per hour. To-day, on my 5⅛-in. 80-lb. rails, for a train of 81 cars of 60,000 lbs. capacity, making a total load of 3,428 gross tons, the resistance shown by indicator cards, for a speed of 20 miles per hour, is only 3 lbs. per ton for the level portions of the line.

"The problem, or rather series of problems, in regard to the stresses in rails, is so complex that no one has as yet been able to make a mathematical analysis of them which satisfies the conditions of practice. These stresses can only be determined experimentally in the track. That the stresses in rails have always been large is well known. The fact that they are of short duration permits stresses in them which would not be permissible in bridges. The set in rails, described in former papers, shows that the light rails were frequently subjected to stresses beyond the elastic limit of the steel.

"The recent experimental work with the author's stremmatograph in determining the stresses in rails under moving trains establishes the important fact that the metal in rails is subjected to very large fiber stresses, and shows how these stresses are distributed in heavy rails."

Discussion on the Kytchtym Medal.

By Dr. Persifor Frazer, Philadelphia, Pa.

In this discussion Mr. O. S. Garretson, Buffalo, N. Y., does not think the casting is exceptionally fine; he has often made castings of similar character equally good. For instance, a coin, moulded directly in fine sand, and cast in Scotch (or the equally good, if not better, "American-Scotch") foundry iron gave a copy quite as sharp and smooth as the original. The secret is in using very fine sifted sand.

R. W. Raymond, New York City, says that the analyses of the iron of this medal, communicated in Dr. Frazer's paper, certainly do not indicate any peculiar composition likely to confer upon the iron extraordinary fluidity or freedom from shrinkage in the mould. Nor is the medal itself comparable for delicacy with the famous castings from Ilsenburg, in the Harz, which were illustrated in a separate exhibit at the Columbian Exposition of 1893, in Chicago.

Some years ago the Hecla Iron Works, Messrs. Poulsen & Eger, of Brooklyn, N. Y., exhibited artistic castings in iron, which closely approached the Ilsenburg standard. Thin patterns were shaped and first cast in plaster by artists of special skill, and the firm maintained for the education of its employees a regular school of design. The Hecla Iron Works are still in existence, and furnish the architectural and ornamental iron work of many New York interiors; and ascribe their success to the use of the proper material, and also to the skillful pattern makers and moulders employed. Now there are in this country many concerns which turn out very handsome castings, but I think we may fairly claim that they are all, more or less, the outgrowth of this. The ornamental iron work for building purposes produced in this country is superior to that from any other country, and is so recognized abroad.

The school of design which was formerly maintained for the employees has been given up as being no longer necessary, in view of the greatly increased opportunities for such instruction now open to ambitious mechanics in trade schools, etc.

Dr. Raymond adds that a very interesting illustration of delicate castings in low relief was furnished in 1887 by the remarkable reproductions in cast-iron of carbonized lace, etc., for which Mr. A. E. Outerbridge, Jr., of Philadelphia, received from the Franklin Institute the John Scott Legacy Medal and Premium. The novelty of Mr. Outerbridge's work consisted in the method by which lace, leaves and other organic fabrics or structures were previously carbonized, before introduction into the moulding flask. The objects were placed in a cast-iron box, the bottom of which was covered with a layer of powdered carbon; then another layer of carbon dust was sprinkled over them; the box, covered with a close fitting lid, was heated gradually in an oven, to expel moisture, and the temperature was slowly raised until the escape of blue smoke from under the lid had ceased. The box was then heated white hot, kept in this condition for two hours, and then removed from the fire and allowed to cool. The fabrics, etc., thus carbonized were not brittle, and could be made white hot before consuming. In making castings from them they were laid smoothly upon a face of green sand in the mould, and the molten metal was poured upon them. In one case a piece of lace was suspended vertically in the mould, and the molten iron was introduced on both sides of it, so as to rise to a common level. When the casting was cold it was thrown upon the floor of the foundry, and separated into two parts, while the lace fell out uninjured, and the pattern was found to be reproduced upon both faces of the casting.

The Coking, in Beehive Ovens, of the Coals of the New River District, West Virginia.

By Charles Catlett, Staunton, Va.

The New River District comprises the mines working on the coals of No. XII. or the Conglomerate Series of the Rogers Brothers, which are located on New River and its tributaries, and which find an outlet for their product east and west over the Chesapeake & Ohio Railway. The New River and Pocahontas coals are very similar in chemical composition. The differences which exist are apparently all in favor of the former, the coal, as a rule, carrying less ash, less sulphur, and slightly more volatile matter. In the matter of ash, the clean coal is remarkably pure; the writer having examined numerous picked samples which carried less than 1 per cent. in ash. Mendenhall and Campbell report a number of analyses of what is known as the Sewell seam, the average of which is: Moisture, 0.73; volatile matter, 26.43; fixed carbon, 70.04; ash, 2.46; sulphur, 0.56.

The coke of the district is made from slack coal, which naturally carries an undue proportion of impurities; but, in spite of this, the coke will usually run only about 6 per cent. in ash. A shipment of coke made during 1898 by the New River Coke Company for special purposes, and from slack coal which had been screened to separate slate, etc., showed 4.23 per cent. ash. The coal from which this coke was made must, therefore, have carried about 3 per cent. of ash. This is sufficient to give an idea of the character of the coal in this particular. The material entering into the manufacture of coke will usually carry a larger amount of ash than this special shipment; but in all cases the coal makes a coke of special value for shipment to considerable distances, where the freight on even 1 per cent. of ash amounts to a good deal. The sulphur, while variable, is usually quite low, running from 0.50 to 0.60 per cent., but often less.

Owing to the fact that the coke from this coal has been used to a very limited extent for the manufacture of Bessemer steel, little attention has been paid to the phosphorus-contents, and but few analyses have been made. Tnose which have been made show an exceptionally small amount of that element. A coal of the average composition would theoretically furnish about 75 per cent. of coke. As a matter of fact, the majority of the ovens in the district do not yield 60 per cent., and many of them run less than 55 per cent.

The ovens of the New River Coke Company, which are bank-ovens, were built in 1888; and, while some of them have suffered from landslides, they may be considered, as a whole, to be in good condition; they are not, however, in the best condition with reference to the retention of heat and the perfect regulation of the admission of air, so that a maximum yield cannot be expected.

Most of the ovens are 12 ft. in diameter and 6.5 ft. high on the inside. They are 30 in. high to the spring of the arch. The doors are 2 ft. 5.5 in. wide and 2 ft. 3.5 in. high to the spring of the arch, which is 5 in. high, making a total height of 2 ft. 8.5 in. Some of the doors are 1.5 in. higher. All the ovens are provided with draft-boxes, located on either side of the door, and slightly deflected where they enter the oven, so as to be at right angles to the axis on which the oven is constructed. Where these draft-boxes enter the oven, they intersect an arc of about 50 degrees. The inlet is 6 in. wide by 5 in. high, and is closed with a sliding lid. Where the draft enters the oven the hole is 4 in. high by 7 in. wide, and the bottom of the opening is 4 ft. from the floor of the oven. In process of time these boxes have got into bad condition, being sunken, so as to deliver the draft against the coke, or closed up, etc.

A large number of observations were made of the burning of a set of eight ovens by means of the draft-boxes, extending over a period of about two weeks. The results are given in detail in a series of tables accompanying the report. At the time of the observations the ovens were working on 72-hour and 96-hour coke. The charges for 72-hour coke averaged 10,640 lbs., and for 96-hour coke 11,312 lbs. All coal was accurately weighed. The ovens were afflicted with cold bottoms which had a tendency to become wet from only a small amount of rain. They were exceptionally difficult to burn out so as to give clean bottoms over the entire over. "Black ends" do not mean unburnt coal, but dark-colored coke for a distance of 0.5 to 1 in. from the bottom.

The figures given in these tables are by no means conclusive on any point; but they show what a small amount of air is at times necessary to burn out the oven in the proper time; and they have been productive of much good in directing attention to the excessive draft which had formerly been used, and have also served to call attention to the necessity of protecting the ovens from small leakages, and to emphasize the fact that every pound of air going into the ovens unnecessarily is a source of loss. They have also served as a basis for other investigations, of which circumstances did not permit a record, and have been, it is believed, instrumental in effecting an increase in the average yield for the year of 4 per cent. more than the ovens had ever produced before.

Some tests were also made with reference to the size of the ring, which was originally very large, and which in many cases had been worn even larger. The serious loss of heat from this source does not seem to have been fully recognized. Rings of various sizes were experimented with, the smallest being about 11 in. in diameter. The results with this size were quite good, but the general indications were that it was a little too small; and 12 in. is believed to be about the right size for this coal and these ovens.

FIBROUS TALC IN ST. LAWRENCE COUNTY, NEW YORK.

Written for the Engineering and Mining Journal by J. Nelson Nevius.

The extent of the unique deposit of fibrous talc in this region is, as yet, unknown. The more important mines now operating are located either in the village of Talcville, township of Edwards, or in Little York, township of Fowler, which adjoins Edwards on the west. The intervening country, for a distance of 5 miles, or more, has been prospected in a superficial manner, but without much success. However, in nearly all of the shallow openings thus made, the characteristic rocks which surround the talc deposit have been found, and the chances are excellent for reaching talc at a greater depth if the enormous supply in sight in the mines is ever exhausted, and new mines become necessary.

The rocks of this region are all crystalline. Belts of marble, which varies in color from the beautiful gray material quarried at several points near Gouverneur, to a pure white variety strongly resembling the Westchester County product, alternate with belts of gneiss of greatly varying color, texture and composition. These belts extend in a general northeast and southwest direction. Their history has not been exhaustively studied. Segregations of minerals—tourmaline, apatite, sphene, pyrite, graphite, etc.—which occur in the marble near its contact with the gneiss, and which occur also as included masses in the gneiss, indicate (1) that the latter rock is a gneissoid or sheared granite rather than a true gneiss; and (2) that it is younger than the marble. The few reports which have been made on this region confirm this view.

FIG. 1.—ENTRANCE TO MINE NO. 5, TALCVILLE.

FIG.—2.—MINE NO. 5 IN FOREGROUND, AND MINE NO. 6 IN DISTANCE, TALCVILLE, N. Y.

Judging from what observations can be made in the mines at Talcville, the talc deposit lies within the marble formation, though in many places the gneiss is very near at hand.

There are about a dozen mines at Talcville, though half of them are now idle on account of the dullness of trade. They are situated in three groups, on the sides of low hillocks, along an approximately east-northeast line. As the strike of the country rock is almost identical with the direction of the line between the mines, it is possible that the latter are all located on the same seam of talc, which may be continuous over the entire distance.

Opposite the railroad station at Talcville a ledge of pink gneiss is exposed in a railroad cut. The strike here is east-northeast and the dip is about 58° north-northwest. At other points in the vicinity of the mines the dip varies considerably from this angle, and the strike varies to a less extent. The country rock, in the immediate vicinity of the mines, is almost exclusively a massive gray or pink gneiss.

The mines are similar in general characteristics, though some differences can be noticed in both the walls and the products. Mine No. 3, of the International Pulp Company, is entered by a shaft, which follows the dip of the country rock at an angle of about 50°. The cross-section of the shaft is variable, but is nowhere less than 6 by 8 ft. Timbering is necessary only at weak points, and where the shaft is unusually wide, as the rock is massive gneiss, which is replaced by massive, white, tremolitic dolomite, as the talc seam is approached.

The bottom of the mine is 300 ft. below the surface, though the talc seam was struck at a less depth. The shaft extends to this depth in order to get below an old mine which had caved in. The drift slopes slightly upward away from the foot of the shaft to give drainage and to facilitate moving the loaded cars to the shaft. The hanging and foot walls are nearly parallel, and dip at an angle of 50°. The seam of talc, which varies in thickness from 15 to 25 ft., and is of unknown width, has been removed for a distance of 250 ft. along the strike of the walls, and a distance of 60 ft. along their dip. At the breast of the drift the greenish tint of the talc and the white dust caused by mining operations give to the talc the appearance of a mass of ice covered with an inch or two of snow. This white dust covers everything in the mine and gives a very treacherous footing, so that observations of the walls are made with the greatest difficulty.

Owing to the toughness of the talc continual blasting is necessary. The talc is loaded into a hand-car, which runs on iron rails, and is pushed by two men down the drift to the bottom of the shaft. Here the talc is dumped into another car which is operated on a skip-way by a cable from the surface. This car conveys the talc out of the mine and on a trestle 35 ft. in height. On this trestle the material is sorted, the waste is thrown out, and the talc is dumped into a third car which conveys it to the railroad, where it is loaded on flat-cars to be conveyed to the grinding mills.

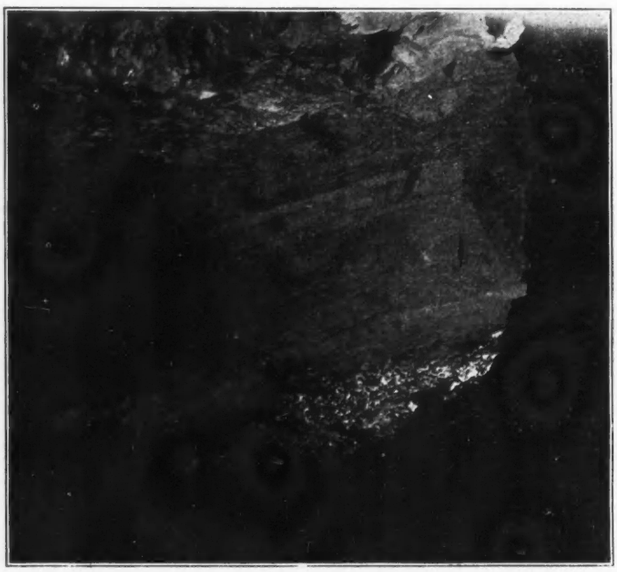


FIG. 3.—PILLAR IN COLUMBIAN TALC MINE, LITTLE YORK.

TALC MINING IN ST. LAWRENCE COUNTY, NEW YORK.
(From photographs taken for the New York State Museum.)

Where the shaft first cut the talc seam a drift was started in the same direction as the lower one, now in use, but it was too near to the old cave-in, so it was abandoned. It was subsequently connected with the main drift by an uplift along the seam, leaving a supporting pillar which gives an excellent section of the deposit.

Mine No. 5, of the International Pulp Company, is located about 1,500 ft. distant from mine No. 3 on the east side of the same hillock. It is not quite so deep as its neighbor, and is operated on two levels. The skip-way is considerably steeper and the cars are automatically dumped into a car which runs down to the railroad by gravity, and is hauled back by cable. Fig. 1 shows the skip-way of Mine No. 5, the dumping shed and the cable road leading to the railroad. Fig. 2 shows the engine house and dumping shed of Mine No. 5 in the foreground, and the buildings of mine No. 6 in the distance. A slight difference in texture between the best grades of talc from Mines Nos. 3 and 5 can be noticed; in fact this statement is true of almost any two of the mines.

The Columbian Talc Company operates mines and a mill on lot No. 106, Little York, township of Fowler. At the time of the writer's visit the principal mine, having been idle, had become filled with water which was being pumped out, and was not accessible below the second level. Judging from what could be seen this mine differs from the others only in that the talc seam is thinner, averaging 15 ft., and this fact necessitates working it on several levels, pillars being left at regular intervals to support the hanging wall. These pillars present excellent sections of the talc seam, and show its association with the walls. Figure 3 shows one of these pillars in which the contact of the talc with both walls is strongly marked.

Another opening was being made within a few hundred feet of the old mine, to cut the same seam. It reached scaly talc at a distance of 40 ft. below the surface, which graded into first quality material 10 ft. lower. The mill is located within a couple of hundred yards of the mine, and the talc is conveyed to it in cars operated by hand power.

Two grades of talc are mined: (1) "First quality fiber," which is a tough, compact rock, somewhat variable in appearance and texture. Its

two chief types are characterized as follows: (A) Distinctly fibrous in structure, with clusters of fibers ramifying in all directions, and usually of a grayish tint; and (B) lacking somewhat in the fibrous appearance, as the fibers tend to run in one direction, and usually of a light greenish tint. Both types form a snow-white pulp when ground. (2) "Second quality fiber," which may be either (A) "gritty," when an otherwise first quality material contains some harder impurity, which is usually tremolite, or some other member of the amphibole group of minerals; or (B) "scaly" when it loses its fibrous structure and consequent tough character and becomes flaky and brittle. This variety is more predominant in the mines at Fowler than in those at Talcville. Second quality talc is useful only to a limited extent, as the pulp must contain but little gritty or scaly material.

In all the mines examined the walls of the talc deposit were nowhere found to be the gneiss which outcrops about the mines. The talc in some places has an abrupt contact with highly crystalline, white, tremolitic dolomite; or there may be an inch or two of williamsite between the two. (These occurrences are probably due to faulting.) In other places it passes gradually from first quality fiber, through second class, gritty material, and fades into a tremolitic schist, or dolomite, wall. This seems to be the typical occurrence, and it is well shown in Mine No. 5, where the gritty talc grades gradually into a massive amphibolitic rock.

C. H. Smith, Jr, in Vol. XVII. of the "School of Mines Quarterly," describes the occurrence and formation of the talc. He says: "In most accounts* it is stated that the talc forms a clearly defined vein with walls of granite or gneiss, the veins being penetrated by and including horses of tremolite."

"According to the writer's observations the talc occurs in the form of beds, lying wholly within the schist of the limestone formation. They (the talc beds) dip and strike with the rest of the formation and have schist for both foot and hanging, sometimes with an intervening thin layer composed largely of quartz. There is little in the character of the beds to suggest a vein formation, while the walls of gneiss and granite are wholly lacking."

As to the origin of the talc, Prof. Smyth bases his conclusions on the microscopic examination of the material, as well as upon the field study, and he points out that the talc is an alteration product derived from beds of tremolite schist in the limestone, and that all gradations between the talc and the unaltered tremolite can be found. In conclusion he says: "The deposits of talc are of complex origin, and the process which has led to their formation consisted of three distinct stages. First, there was formed an impure silicious and magnesian limestone. Second, this rock underwent metamorphism and was converted into enstatite and tremolite schist. Third, this schist, by the action of water charged with CO_2, was converted into talc."

In the report of the New York State Geologist for 1895, page 666, Prof. Smyth says: "The schist probably has resulted from the metamorphism of a silicious and magnesian portion of the limestone, being a product of the general metamorphism of the region. Subsequently, parts of the metmorphic silicates have been altered into talc by addition of water and loss of lime. This alteration, while most pronounced along certain horizons in the schist, is more or less irregular, causing variations in the thickness and precise location of the talc beds, which are further increased by mechanical disturbances.

Most of the Edwards talc shows the fibrous structure of the original minerals, and, in fact, as at the Fowler localities, contains a greater or less amount of residual tremolite or enstatite. This is shown by tests of the hardness of different parts of specimens, or, still better, by a microscopic examination." On page 668 he says: "The presence of scales of talc, in many specimens, indicates that it cannot be regarded as entirely pseudomorphous, as these scales certainly do not have the form of the original minerals. On the contrary, the form is that of talc itself, and must have resulted directly from the independent growth of that mineral. The materials, doubtless, were supplied by the constituents of the schist, but the structure of the latter, physical as well as chemical, has broken down. From this, it seems possible that the fibrous structure of the deposits may be an indication of a lack of completeness in the process of alteration, which, if continued to its ultimate end, would convert all of the schist to scaly talc."

The observation of the writer, which were made for the New York State Museum, agree in all essential particulars with the theory of origin advanced by Prof. Smyth.

The companies engaged in the talc industry are the International Pulp Company, which is the largest operator, and which has absorbed the Adirondack Pulp Company, the Agalite Fiber Company, the Natural Dam Pulp Company, the St. Lawrence Pulp Company, and the Asbestos Pulp Company; the United States Talc Company, which is the second largest operator; the Columbian Talc Company, Keller Brothers, and the American Talc Company.

The word "pulp" is used in this article to designate pulverized talc, the finished product of the mills. In the northeastern part of the State this word refers to ground poplar wood, and in the paper mills it is used to designate the digested paper before it is run out upon the drying felts.

The pulp mills are located along the Oswegatchie River, between Talcville and Gouverneur. Some of the smaller mills are operated by water power, but the majority use steam power exclusively, or combine the two. The mills are several miles from the mines, and the Gouverneur & Oswegatchie Railroad transports the raw talc to the mills and carries the pulp to the main line of the Rome, Watertown & Ogdensburg Railroad. The operations are practically identical in all the mills.

Mill No. 3, of the International Pulp Company, is located at Hailesboro, about 1½ miles east of Gouverneur. It is one of this company's standard mills, of which several others are scattered to the eastward, in the direction of the mines. Almost the entire process of pulverization is performed by automatic machinery, so that after a supply of the raw material has been prepared by the day shift, the mill requires but little attention during the night, except for the final operations of weighing the bags and loading them on the cars.

The talc, as it comes from the mines, varies in size from dust to masses 2 ft. or more in length. As already mentioned, there is some difference in color, and considerable difference in texture and quality of the products of the different mines, but the materials are so mixed by experienced workmen that the finished product is of a uniform color and quality.

The process of pulverization consists of eight operations. (1) The larger masses of talc are reduced in size with a sledge, until the pieces are not more than 8 or 9 in. in greatest diameter. (2) It is passed through a Blake crusher and (3) fed by a belt between a pair of slightly corrugated steel rolls 30 in. in diameter, one of which acts against a rubber cushion which takes up the jar occasioned by the rolls striking the larger pieces of talc. These rolls reduce the talc to a size ¼ in. or less. When the rolls strike large fragments they spring apart and coarser material may get through them. (4) From these rolls the crushed talc is carried by an endless belt conveyor to bins on the top floor of the mill. During the day enough material is crushed to supply the mill during the night. (5) From these bins it feeds automatically into Griffin mills on the floor below. The Griffin mill consists of two inclosed steel plates which revolve rapidly in opposite directions, but are not in contact. The object of the space between the plates is to cause the talc to be crushed by striking against its own particles, thereby preventing the admixture of particles of iron that would be worn from the plates and might eventually discolor the pulp. A draft of air is forced through the mill, and as the talc becomes fairly fine it is blown through a conduit and falls to the floor below. (6) It is brought back to the second floor by a bucket-belt conveyor and dropped into large hopper-shaped bin-cars. These are used for storing, as well as for conveying, the material. They run on tracks which extend over a series of Alsing cylinders. These are made of steel, 6 ft. in diameter and 10 ft. in length; are lined with enameled, porcelain brick; are fitted with an opening in the side into which a cover screws, and are arranged to revolve horizontally about the long axis. (7) Into one of these cylinders the contents of a bin-car are emptied through an opening in the bottom. A quantity of water-worn quartz pebbles 2½ in. and smaller in diameter are placed in the cylinder along with the talc. The opening in the cylinder is then closed and the cylinder slowly revolved. The incessant pounding and rubbing of the pebbles as the cylinder revolves completes the pulverization of the talc. When this process is completed the cylinder is stopped, the cover of the aperture is removed and replaced by a grating, the spaces of which are ⅜ in. wide. The cylinder is again revolved, and the finely pulverized talc falls through the grating, while the pebbles and pieces of them that may have been broken are retained in the cylinder. (8) The pulp falls, from the Alsing cylinder, into a bin having a tapering bottom, which leads down to the automatic bag-filling device on the main floor. This machine loads approximately 50 lbs. of pulp into a paper bag which is placed beneath the spout by hand, and packs it by means of a revolving disc acting against the rising platform which carries the bag. The weight of the bag is then corrected on a scale, and the bag is loaded directly on the car for shipment. There are two bag-filling machines in this mill, each of which requires the services of two men to handle the bags, and fills about 200 bags an hour. The pulp is packed also in 160-lb. cloth bags.

In the largest mill, No. 6, the International Pulp Company is experimenting successfully with a secret process by which grit and other impurities will be separated from the pulp, thereby producing a finer grade of stock.

The pulp formerly sold for about $30 per ton, but recent competition has reduced the value to about $7.50 per ton, and has so nearly destroyed the profit that many of the smaller concerns have been driven out of the business.

The pulp is prepared in several grades, and each company has its special names for the various grades. The greatest demand for the pulp comes from the paper industry. It is used as a filler in many qualities of paper, but the greatest consumption is in the manufacture of newspaper stock, for which purpose it is mixed with wood pulp. The talc pulp thus used is a very finely pulverized grade, designated "finished asbestine pulp" by the International Pulp Company, and "fine cylinder stock" by the United States Talc Company. A less finely pulverized ("fluffy") grade is produced by omitting the Alsing cylinder process, already described. This grade is used with "asbestos" (chrysotile) fiber in the manufacture of asbestos paper, aspestos packing, etc., and is designated "special asbestine pulp" by the International Pulp Company, and "No. 1 buhr stock" by the United States Talc Company. The talc is used also in the manufacture of certain paints and wall plasters, and as an adulterant in soaps and similar articles.

The production of fibrous talc in 1898 was about 68,000 tons (9,000 tons more than in 1897), the average value of which was $5 a ton, or less than in any preceding year.

*A. Sahlin, "Transactions American Institute Mining Engineers," Vol. XXI., page 583, and "Mineral Industry," Vol. I., page 435. C. A. Waldo, "Mineral Industry," Vol. II., page 603.

FIRE IN A TURKISH COAL MINE.—According to the "Levant Herald" the coal mines of Libandja, in the district of Serfidje, in the province of Salonica, are still in a highly inflammable state, the fire gradually burning through from mine to mine. The villages in the district are threatened. The Turkish Minister of Agriculture, Mines and Forests has taken measures to extinguish the fire, and has obtained the money necessary for that purpose.

THE UTILIZATION OF BY-PRODUCTS IN SWEDEN.—The leading Swedish iron works are now carefully utilizing the by-products of both charcoal burning and iron smelting. At Domnarfvet the blast furnace gas is used at the furnace and in other parts of the works, and has an annual fuel valve equal to 14,000 tons of good mineral coal. From the furnace slag 140,000 to 150,000 slag bricks are made annually. The charcoal by-products include wood spirit of methyl alcohol, acetate of lime and wood tar.

THE LATEST CYANIDE PLANT IN THE TRANSVAAL.*

The latest cyaniding plant for tailings built in the Witwatersrand District of the Transvaal is that of the Henry Nourse Gold Mining Company, and as it embodies the latest improvements and the results of extended experience in the treatment of tailings, the description presents many points of interest.

The new works are in the main similar to the Glen Deep equipment, but at the Henry Nourse several simple ideas have been put into effect which are lacking in the former plant.

The tailings wheel is the largest on the Rand, and possesses many features of striking interest. A good idea of its general construction can be formed from the illustration. In diameter the wheel is 60 ft. to the bottom of the buckets and 55 ft. between the ropes which drive it, and is of the single-bucket type. Each of the buckets, of which there are 230, is lined with American redwood, and when these liners are worn out they can be renewed with little trouble. A feature worthy of note is the introduction of drip-catchers made of wood. These are fixed near the top of the wheel and in close proximity to the buckets, and prevent the splash of tailings, In the wheel under review the absence of drip and splash is most remarkable.

The spokes of the wheel are made of light timber, 8 by 4 in., held together by iron tie-bolts 1 in. in diameter. The axle is made of steel and is 20 ft. long by 14 in. diameter, reduced to 12 in. at each end for a distance of 2 ft. 6 in. in the bearings. The total weight of this tremendous shaft is 4½ tons, and as it was raised with the bosses of the wheel on, the total weight lifted at one operation was about 10 tons.

The tower supporting the wheel is of steel throughout, the design being a double A-frame. The uprights, of which there are four on either side of the wheel, consist of 12 by 3 in. channel steel, braced together by 6 by 2½ in. channel steel. The towers are not quite vertical, but lean towards one another in the form of a slightly acute angle, the points being braced together just above the top of the wheel. The towers are bedded on eight capstones (four on each side of the wheel), measuring 4 ft. by 5 ft. by 2 ft. deep, resting on masonry foundations 6 ft. square, set on the solid rock which here crops out at the surface. The platform at the top of the wheel measures 40 ft. long by 6 ft. wide.

The driving is done by one endless rope, 1¾ in. diameter, the sag of which is taken up by a tension carriage. To avoid any swinging of the rope during a strong wind which might cause it to slip off the wheel, a deeply grooved iron guide pulley fixed in a vertical slide has been brought into requisition, and this, while acting as a guide, can also be made to increase the tension of the rope at any time. This extra precaution has been taken owing to a serious breakdown occuring on another mine through the rope slipping off the tailings wheel during a strong wind, and doing considerable damage. The total length of rope required to drive the tailings wheel is 1,100 ft., and the splice is 30 ft. The wheel makes only three revolutions per minute, but it is probable that even this low speed will be slightly reduced, as the lifting capacity is far in excess of the crushing power of the 80-stamp mill. The driving power is taken off the mill line shaft and transmitted through bevel gear, a countershaft and intermeidate gearing set at 2½ to 1, to a driving pulley 11 ft. diameter. A friction clutch is in use, and this enables the machine to be set in motion as slowly and gradually as can be desired.

The launder which conducts the pulp to the tailings wheel has been so arranged that the tailings, when necessary, can be turned off at a moment's notice, and run down a tailrace into a storage dam, whence they would be trammed back by a mechanical haulage, now in contemplation, to the tailings wheel. The wheel was designed by Mr. L. I. Seymour.

After being discharged by the wheel, the tailings are classified by spitzluten, the concentrates and coarse sands going to the vats reserved for them, while the remaining sands are separated from the slimes by spitzkasten, the latter going at once to the slimes dam, and the remaining pulp being distributed through 3½-in. hose to the vats.

There are 12 vats in all, erected on the double teatment system, and each has a capacity of 400 tons. The six upper vats are 40 ft. diameter and 8 ft. deep, the lower ones being 37 ft. by 10 ft. These are made of closely riveted sheet steel ¼ in. in thickness, the rivets being 1¾ in. between centers. The vats do not rest on masonry walls, as is the usual custom, but are supported by tubular steel pillars, the outer ones being 15 in. diameter and those immediately underneath the vats 6 in. diameter. The outer columns are provided with stout shoulders, and on these the lower vats rest, while the upper vats are seated on girders which rest on the tops of the principals. The main beams supporting the lower vats are H girders 16 in. by 6 in.; and across these are laid 12 by 5 in. beams of the same description. Across the latter are laid in close proximity 9 by 3 in. wooden joists, all previously boiled in tar, and upon these the tank bottoms rest. To obviate the possibility of the bottoms buckling, they are bolted at intervals to the upper joists.

Another departure is observable in the laying down of an asphalt basement under the vats and around the tailings wheel. This was to have been laid in such a way that any solution finding its way through the vats would drain off into a sump, whence it would be periodically pumped into the precipitating boxes.

Each of the vats is provided with bottom discharge through seven doors, and these are easily taken off. Owing to the introduction of tubular pillars instead of the usual masonry supports, the basement is spacious and open, and the closest examination of the vats can be made or the smallest leakage detected, if present. In place of these smaller pillars, the upper vats are each supported by two massive girders, 20 in. at the base, weighing over 9 tons each, and with powerful stiffening ribs riveted close to one another. These girders rest on the 16-in. outer pillars previously referred to. Of the 12 vats, two top and two bottom are reserved for the concentrates, and the remainder for the residual sands. The spitzluten, it is estimated, will catch 20 to 25 per cent. of the tailings, and these concentrates are expected to yield 15 dwts. per ton. The remainder of the pulp, after a great percentage of the slimes has been carried off, will be subjected to about 6 days' treatment in the upper tanks with cyanide solution, after which the sands will be discharged into the lower tanks and teated for a similar period with stronger solution. The solution from the upper tanks gravitates direct for treatment into two of the extractor boxes, but owing to the latter being at a slightly higher elevation than the lower vats, the solution from these vats gravitates into sumps in the extractor house and is then pumped up to the "steady head" tanks prior to passing into the precipitating boxes.

Most of the gold will be caught in the lower cyanide vats, according to the estimate Mr. Geo. Melville, the cyanide manager, has formed on experience with the old plant. His extraction over a period of 12 months was 80 per cent., which is highly satisfactory, and by continuing his treatment on the same lines as heretofore in the new vats he anticipates an equally good if not better extraction.

The extractor house has been entirely rebuilt, but the same machinery is in use as before, with some alterations. The pumps are operated off a countershaft, driven by bevel gear from the mill shaft. These pumps consist of four 4-in. vacuum pumps and two 5-in. centrifugal pumps for pumping the solution to the cyanide vats. Each of these pumps is provided with interchangeable valves so that any pump can be requisitioned for pumping any particular solution. A similar arrangement is observable in connection with the gold bearing solutions about to enter the extractor boxes. These solutions are pumped through four pipes into four independent launders laid over four "steady head" tanks. Each launder is fitted with a detachable plug, situated immediately over each tank, and by removing the various plugs the solution from any sump can be run into any desired tank, and from these into any of the extractor boxes. The latter are eight in number and have been raised upon a platform 8 ft. above the ground. The four small tanks are also situated on this platform.

The floor of the extractor house is to be laid with cement on a 9-in. gradient, so that all liquids, water used for washing down purposes, etc., can gravitate into the sumps, and loss of gold be obviated. The extractor house measures 120 ft. long by 45 ft. wide, and is well lighted by skylights during the day and incandescent electric lights at night.

The old cyanide plant is now being converted into a slimes plant, but the work is not yet completed. Mechanical agitators will be fitted to the vats and the slimes treated on the lines now commonly adopted. It is estimated that from 75,000 to 100,000 tons of accumulated slimes will be ready for treatment, and these are expected to average 0.2 oz. to the ton, which should leave a substantial profit. The slimes at present being formed amount to 2,500 tons per month, and are being settled in the old slimes dam, which, owing to the large quantity already accumulated, has given considerable trouble for some time past by bursting its banks.

The design and execution of the new plant is due to Mr. L. I. Seymour, the consulting engineer; Mr. J. Whitburn, the manager, and Mr. F. J. Pollard, the resident engineer.

*Abstract of article in "Machinery," Johannesburg, South African Republic.

A RECENT CHLORINATION MILL.

In a mill recently completed in the Cripple Creek District from the plans of Mr. John E. Rothwell, of Denver, several improvements have been introduced. The capacity of the mill is 25 to 30 tons daily. The total labor required in the mill is 5 men on the day and 3 on the night shift, 8 all told, and several different lots of ore can be sampled. If the mill were treating the ore of one mine 7 men would do it all, as everything is automatic. The ore, except the one-tenth taken out when sampling, is not touched by hand after it has been fed to the rock breaker. With the slow speed crushing rolls an excellent leaching product is made, being quite granular, and with very little dust. In the furnace the fire-boxes have been so altered that they are practically very effective gas producers and are easily taken off, and as they are not above a dark red heat their life is materially increased. The heat on the hearth of the furnace can be raised to a sintering one if necessary and is much more easily distributed than with the ordinary fire-boxes; at the same time an inferior fuel can be used and less of it. In this mill a light friable lignite is used.

The automatic cooling device works without trouble and does its work perfectly. It requires a floor space about 5 ft. 6 in. square and is 11 ft. total height. It takes the ore from the furnace at a good bright red heat and delivers it into the elevator to the chlorination department at a temperature so low that any one can hold it in his hand. This is done while the mill is running at the maximum capacity. The whole apparatus is practically dust proof and requires no attention besides that the firemen can give, which is simply to see that the flow of water through it is ample for cooling, and that the device for taking the cooled ore away is doing it as fast as it comes from the furnace. This is very simple, as there is plenty of leeway to take care of any irregularity in the feed of the furnace.

In the chlorination department one man on a shift looks after the two barrels and the solution and precipitation and then has plenty of time to spare. The whole plant as dry crushing mills go is free from dust, and it is possible to leave the door between the crushing department and the engine room open without detriment to the engine, which shows that there is very little.

In this mill there are no partitions between the different departments, so that standing on the floor of the crushing mill a man can look over the whole.

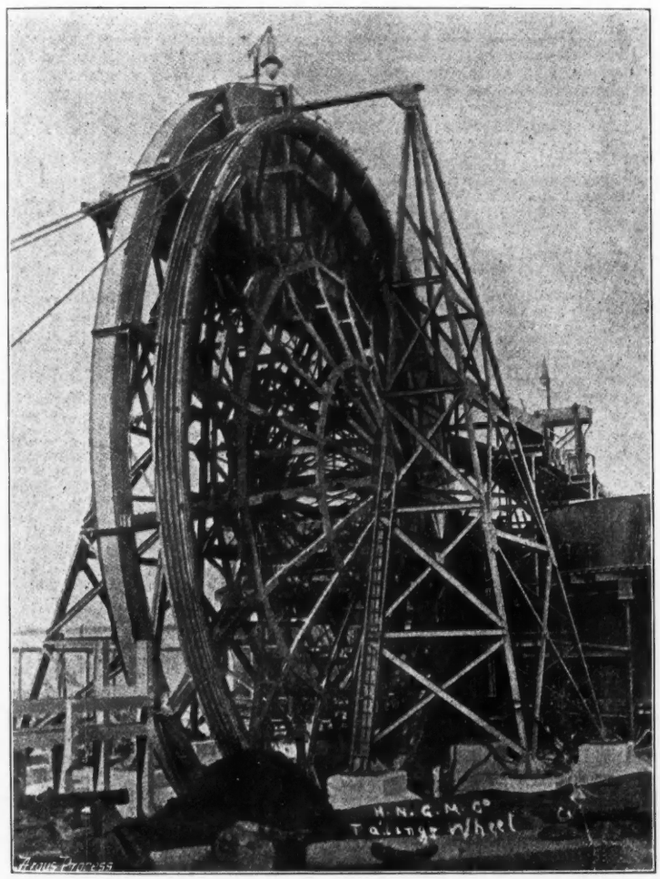
RAILROAD RATES ON IRON IN ENGLAND.—United States Consul Halstead at Birmingham, England, in a recent letter, states that the railroad rate from Liverpool to Birmingham is 7s. 7d. ($1.82) a ton. Port, transfer and cartage charges, however, increase this to 10s. 7d. ($2.54) a ton, to which is to be added a custom house charge of 2s. 6d. (60c.) a ton, bringing up the total to $3.14 a ton.

STEAM STAMP FOR THE TAMARACK MILL, MICHIGAN.

There is no mining region in the world where so great a quantity of rock is handled as in the copper mining district of Michigan. Practically all of the rock taken from the mines goes through the stamp mills, where it is crushed to liberate the particles of copper. On account of the immense quantity of rock treated it is necessary that steam stamps be used to pulverize it. Until recently the stamps used have been able to handle a quantity of rock in the neighborhood, and not exceeding 350 tons per day of 24 hours, this rock being crushed from the ordinary sized product of a Blake crusher to pass through a 3-16-inch mesh screen.

Recent improvements have been made on these stamps, and upon the system of stamping, so that now the ordinary duty of one stamp is to crush upward of 500 tons per day. Among the more important changes in design which help to accomplish this are the larger steam cylinders used, the increased weight of the stamp, the use of solid cast iron foundation blocks and the quick-opening steam valve. The change in the system of stamping has been in using a coarser screen, returning to the mortar for restamping such part of the product as has not been crushed fine enough to liberate the finer particles of copper.

There are at present in the Lake Superior District two steam stamps accomplishing the astonishing result described above. They were built by Fraser & Chalmers of Chicago for the Tamarack Mining Company. The illustration shown is from a photograph taken of one of these stamps as it appeared when erected in the shops of the builders.

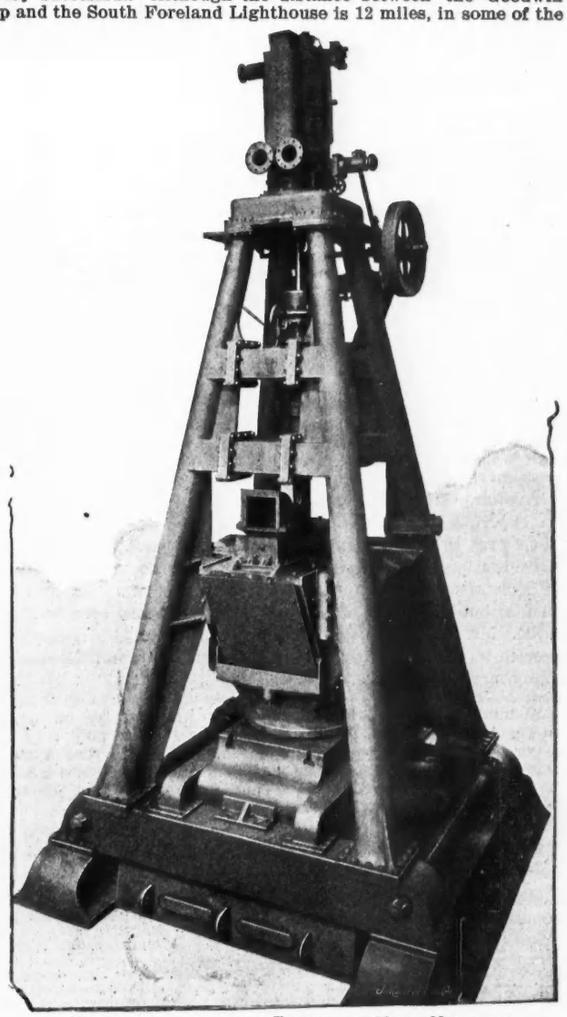


TAILINGS WHEEL AT HENRY NOURSE MINE, IN THE TRANSVAAL.

The steam cylinders are 20-in. diameter, and allow of a maximum fall of the stamp head of 24. in. The weight of the stamp head and reciprocating parts is about 6,500 lbs.

The valve gear is designed to keep the top steam port fully open during the down-stroke, adding the power of the steam to the weight of the stamp, while for the work of the up-stroke (merely lifting the stamp) a small steam admission suffices. The mortar has four discharge screens and rests on a heavy anvil or bed-plate. Angle guide-pieces cast upon a massive and rigid framing of iron columns hold the mortar in place. The guides are planned and fitted with gibs adjustable by set screws and jam nuts. Neither mortar nor anvil need be held down by bolts. The upper and lower guides for the stamp stem are removable bronze bushings, in which the stem is slowly revolved by means of a horizontal pulley on a sleeve between upper and lower guide brackets. This sleeve is brass bushed and contains two feathers fitting in correrponding slots in the stamp stem, by which the latter is rotated. The piston rod is of steel and is connected to the stamp stem by a circular disk, which is encased by a cast-iron bonnet bolted to the flange of the stem. The space between is filled with rubber packing. This arrangement relieves the shock on the piston and permits its removal for repairs without disturbing the stamp. Pistons are made of steel and fitted with bronze packing rings. They are easy of access for packing.

Steam stamps of this type have been furnished for the Tamarack Mining Company (2), the Anaconda Copper Mining Company (13), the Broken Hill Proprietary Company (3), and other important mines. Of the 13 supplied to the Anaconda Company 11 are used for reducing copper ores, using a coarse screen, and 2 in connection with pans and settlers for free-milling silver ores. The latter have five-mesh screens, and take the place of a mill of 120 ordinary stamps of 24-in. The builders have embodied in the design of these stamps all of the latest improvements, and combined with the quality of material and work usually coming from their shops they have built a steam stamp that is claimed to surpass anything of the kind in the copper country. The stamp shown in the illustrations is the largest built so far.



STEAM STAMP FOR THE TAMARACK MILL, MICHIGAN.

WIRELESS TELEGRAPHY.—According to recent English Exchanges, the experiments with Marconi's system of wireless telegraphy between the South Foreland Lighthouse and the East Goodwin Lightship have proved very successful. Although the distance between the Goodwin Lightship and the South Foreland Lighthouse is 12 miles, in some of the tests applied questions asked from the land end were answered from the lightship almost as quickly as by conversation. One important point has, it is stated, been established—that the current is not affected in stormy weather. Besides the ordinary transmitter an instrument is used for recording the messages.

CAST-STEEL LOCOMOTIVE FRAMES.—The use of cast steel locomotive frames is making headway in the United States. The first large single order is that for 25 consolidation engines for the Atchison, Topeka & Santa Fe Railroad, now in the shops at the Baldwin Locomotive Works. For these the Standard Steel Company furnished a few frames, and much the greater part, says the "Railroad Gazette," are from the American Steel Casting Company, and were made at Thurlow. These frames are 24 ft. 4½ in. long and finished to 4 in. wide by 3½ to 5½ in. deep. Each side weighs rough about two tons. The rough weight has gradually been reduced until in the latest frames delivered it is about 1¾ tons. The frames cannot be cast so straight that they can go directly to the planer. The great length of the casting as compared with the cross section is such that some drop at one end is unavoidable, and there must be more or less heating and straightening in the forge shop before the frame is put on the planer. This straightening is, however, no more than must be done to a forged frame after it is welded up. The machining now costs more than that of a forged frame. The material is tougher than wrought iron, and the tools must be run more slowly and with a lighter feed.

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 consultin gexpert. 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.)

Bower-Barff Rustless Iron Process.—Are there any plants using this process in operation?—A. H. P.

Answer.—With regard to this question, which was published in the "Engineering and Mining Journal" February 18th, 1899, we are now informed that a Bower-Barff plant is in use at the Hecla Iron Works, Worth and Berry Streets, Brooklyn, N. Y. These works make architectural iron work, fine castings for ornamental work and other iron work of this class, some of which is necessarily exposed to weather, moisture, etc. The process was seen in operation by some members of the Institute of Mining Engineers during te present week. Other licenses are held and plans worked.

Portland Cement.—What has been the quantity of Portland cement manufactured in the United States, 1897 and 1898? What quantity was imported into the United States in those years?—H. S.

Answer.—The production of Portland cement in the United States in 1897 was 3,030,628 barrels (of 300 lbs. each); in 1898 the production has not yet been ascertained, but there was undoubtedly a considerable increase over 1897, as several new works were in operation, and the demand was large. The imports in 1897 were 418,165 short tons, and in 1898 they were 403,121 short tons. Of the imports reported for 1898 there were 206,982 tons from Germany, 134,163 tons from Belgium, 47,212 tons from Great Britain and the balance from other countries.

The Tatro Electric Process.—Can you give me any information about an elecrtic process which Mr. Mr. C. P. Tatro is operating at Seattle, Washington? I understand that in this process a solution of lime and salt is used, and that the ore is ground to 80-mesh or finer. Is this process operated successfully?—F. R. J.

Answer.—Mr. C. P. Tatro has been engaged for about two years past in experimenting with a process for obtaining gold and silver from their ores in which, so far as we are informed, he uses electricity for precipitating and saving the metals obtained from the ores by leaching. It is claimed that he has attained some degree of success in these experiments; but he has not progressed so far as to treat ores on a commercial scale. Mr. Tatro has declined to make public any description of his process in its present stage, and consequently it is impossible to say anything more about it.

Bismuth.—Is there any market for an ore carrying on controls 15 to 20 per cent. bismuth? The ore carries about 10 oz. gold, 6 oz. silver and 3 per cent lead. The mine is shipping 15 to 20 tons a month. The smelters do not pay anything for bismuth. If this ore was run down in a furnace separately, would there be any demand for the metallic bismuth? About how much would it be worth?—H. E. B.

Answer.—There is a market for metallic bismuth, which is used in alloys, chiefly in the so-called anti-friction metals. Some salts of bismuth are also used to a moderate extent. The present price of metallic bismuth in New York is $1.40 a pound. The supply at present comes from abroad.

See "Engineering and Mining Journal," September 3d, 1898, page 282; "The Mineral Industry," Volume II., V. and VI.

Treatment of Ores by Chlorination.—1. Can ores or mill concentrates containing a high percentage of antimony, arsenic, or zinc be worked successfully by chlorination?

2. If so, what is the principal difficulty in such treatment?

3. Are there any plants in operation to-day on such ores?—G. J.

Answer.—1. Much would depend on the condition of the gold in these ores whether they could be treated successfully or not with economy.

2. The principal difficulty which would be found in treating these ores would be in the proper roasting of the ores.

3. In many of the Western chlorination works ores are being treated successfully which carry several per cent. of antimony, arsenic and zinc.

4. In all cases a thorough test by competent metallurgists is the only way in which you can determine whether such ores, or any particular ore, can be treated successfully by chlorination.

Passage of Sound Through Rock.—What is the greatest distance at which sound can be heard through rock?—M. T.

Answer.—An answer to this question was given in the "Engineering and Mining Journal" of February 18th. Since publishing this answer we have received some additional statements. Thus, at Dorrance Colliery, near Wilkes-Barre, Pa., the inside foreman states that he has distinctly heard the sound of hand-hammers and jumpers through hard sandstone rock for a distance of 150 feet, where he was driving a tunnel from both ends and the faces were directly opposite. The district superintendent of the Lehigh Valley Coal Company at West Pittston, states that he had distinctly heard the sound of hand-hammers striking jumpers through 200 feet of hard sandstone rock. Mr. Conner, division superintendent of the same company, has heard the same sound through 125 feet of rock in the Lehigh region. We are indebted for this information to the kindness of General Superintendent W. A. Lathrop, of the Lehigh Valley Coal Company.

We may add that it is a matter of current tradition that the cannonading at the battle of Gettysburg was plainly heard in several of the collieries around Scranton, though it was not audible to persons on the surface of the ground. It is impossible now to verify this statement, and perhaps it would be best to disregard it. The statements already given as to the distance at which ordinary sounds can be heard through rock are confirmed by the information above.

GAS MAKING IN GREAT BRITAIN.—According to the latest parliamentary returns relating to gas undertakings in the United Kingdom, gas is supplied to the public by 436 companies and 212 local authorities, a total of 648 undertakings. The increase in consumption of gas during the year was about 4.5 per cent. The quantity of coal carbonized was about 319,000 tons more than in the previous year, an increase of 2.6 per cent.

The average number of cubic feet of gas made per ton of coal carbonized in 1897 was, by the companies, 10,553, and by local authorities 10,457. During the last five years the average yield of gas per ton of coal has increased, in the case of companies from 10,157 cubic feet, and in the case of local authorities from 9,871 cubic feet. The employment of water gas as an enricher was made by 20 companies and 11 local authorities.

PATENTS RELATING TO MINING AND METALLURGY.

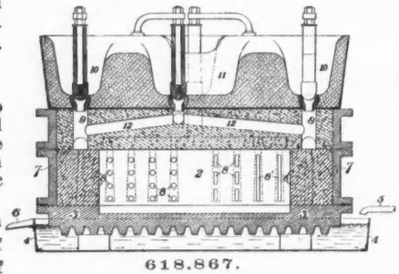
UNITED STATES.

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.

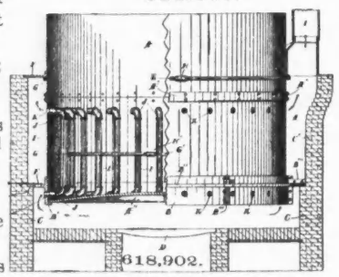
Week Ending February 7th, 1899.

618,858. SWITCH DEVICE FOR FEED-TABLES. Francis I. Freeman, Pittsburgh, Pa. Assignor to the Totten & Hogg Iron and Steel Foundry Company, same place. The combination with a feed-table having a longitudinal series of feed-rollers over and in contact with the upper surfaces of which the metal passes, of a pivoted plate which normally rests entirely below the path of the metal passing over the rollers, and between certain of the rollers, and means for tilting the plate into inclined position across the path of the metal to deflect it from the table.

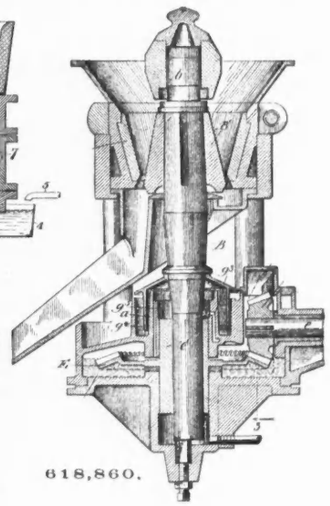
618,860. ROCK AND ORE BREAKER. Philetus W. Gates, Chicago, Ill. Assignor to the Gates Iron Works, same place. The combination of a gyrating shaft, a bevel-gear provided with a hub in and by which the shaft is journaled and gyrated, a bevel-pinion meshing with and adapted to drive the bevel-gear, a frame portion surrounding the bevel-gear and pinion providing a main oil-reservoir beneath the bevel-gear into which the bevel-pinion dips, a portion



618,867.



618,902.



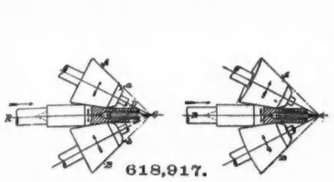
618,860.

of such frame surrounding the hub of the bevel-gear and extending above the same so as to form a cup-shaped oil-recess around the gyrating shaft, an oil-reservoir adjacent to the bevel-pinion into which the oil may be thrown by the bevel-pinion and a channel leading therefrom to the oil-cup surrounding the gyrating shaft so that the impact of the oil thrown on the oil in the oil-reservoir forces it into the oil-cup surrounding the gyrating shaft, and a channel leading from the oil-cup to the main reservoir so as to promote the circulation of the oil.

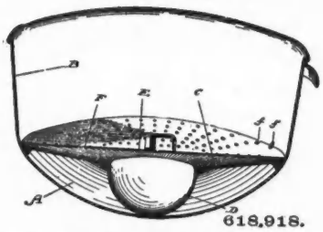
618,867. ART OF CASTING AND APPARATUS THEREFOR. Jacob K. Griffith, Latrobe, Pa. The method consists in pouring the molten metal into a mold, chilling it therein through the bottom more rapidly than from the sides and top, maintaining a fused floating protective layer upon the surface of the metal from at least near the beginning of the pour throughout the same.

618,902. CALCINING APPARATUS. William T. Powers, Grand Rapids, Mich. The combination of a kettle, a setting surroundinig the kettle and at a distance therefrom a flange dividing the space between the kettle and setting, an imperforate bottom in said kettle, a combustion-chamber below the kettle, and flues extending through the side of the kettle at their respective ends, and connecting spaces at each side of the flange.

618,917. MANUFACTURE OF TUBES. Ralph C. Stiefel, Ellwood City, Pa. Assignor to the Shelby Steel Tube Company, Pittsburgh, Pa. The combination of conical revolving bodies disposed to form a pass between them the sides of which converge toward its exit end, a



618,917.

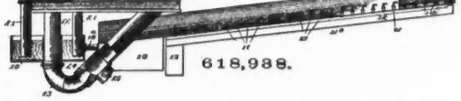


618,918.

piercing-mandrel located in said pass, the axes of the revolving bodies and the lines of their working faces substantially converging toward and intersecting a common point on the axial line of the pass.

618,918. PAN FOR WASHING GOLD. Samuel G. Stoodley, Toronto, Canada. A gold-washing pan embracing in its construction a substantially semispherical-shaped bottom, a cylindrical side or rim projecting upwardly from the bottom, an internal false bottom within the cylindrical rim, a bowl interposed between the false bottom and semispherical-shaped bottom, and an opening through the false bottom into the bowl.

618,938. AMALGAMATING APPARATUS. Victor Hanson, Richmond, Va. Assignor of one-half to James G. Whitlock, Hanover County Va. An apparatus comprising upper and lower reversely-inclined riffle-boxes, transverse troughs having discharge-nozzles outside of the box, reversely-inclined strainers located outside of the riffle-boxes and extending longitudinally of the same and arranged beneath



618,988.

the discharge-nozzles, a collecting-chamber located at the lower end of the lower strainer, a tank receiving the water from the lower riffle-box, a pump located above the tank and having a take-up pipe extending into the same, a feed-pipe depending from the pump, and a lift-pipe extending from the feed-pipe to the upper riffle-box.

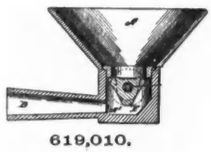
618,950. LIGHTNING ARRESTER. Eugene C. Parham, Johnstown, Pa. Assignor to the Steel Motor Company, same place. The combination of a coil, a movable plunger therein having a magnetizable electrode at its end, a second electrode adjacent to and separated from the magnetizable electrode, a contact member, carried by said plunger, and a contact member, in the line of movement of the first contact member, each of the contact members being in electrical connection with one of the electrodes.

618,955. CAISSON EXCAVATING. Walter H. Gahagan, New York, N. Y. The combination with a caisson having an air-chamber, of a mechanical-power pump carried by the caisson and surrounded by the same air-pressure as exists in said chamber, a discharge-pipe leading from the said pump outward through the caisson, a suction-pipe opening at its free end in said chamber and a water-pipe opening at its lower end into said chamber.

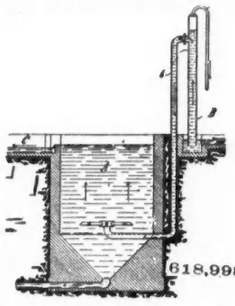
618,993. ELECTRICAL BATTERY. Leonard Paget, New York, N. Y. Assignor to the Reliance Lamp Electric Company, of New Jersey. A battery having a metallic retaining vessel, in combination with a metallic electrode which fits snugly within said vessel, said electrode and the inner surface of the vessel being amalgamated.

618,998. PROCESS OF SEPARATING SUBSTANCES IN THE STATE OF SUSPENSION FROM LIQUIDS. Wilhelm Rothe, Gusten, Germany. A process which consists in drawing the air from the liquid by reducing the atmospheric pressure on its surface before admitting it to the settling-chamber.

619,010. TUYERE IRON. Frank S. Blakesley, Rockford, Ill. Assignor of one-half to the Weyburn & Briggs Company, same place. In combination, a fire-pot, an air-chamber, having an inclined air-deflecting wall, an air-blast pipe opening into the air-chamber, a ring adapted to be set into the lower part of the fire-pot which ring



619,010.



618,998.

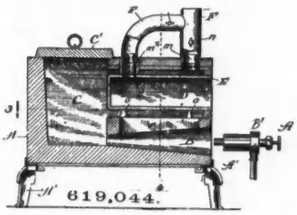
has two depending perforated lugs, a rotatable closure for varying the volume of the air-blast to the fire-pot, having facets of different sizes also having a pivotal opening eccentric to its centre, a rod extending through such opening and through the perforation of the lugs for rotating the closure, and a pipe for incasing the rod.

619,020. PROCESS OF PURIFYING AND REFINING OILS. John C. Henderson, New York, N. Y. The process consists in first driving off the air by means of steam introduced above the oil, then washing all albuminous gummy, resinous and mucilaginous matter from the oil with water at about atmospheric pressure in a closed receptacle.

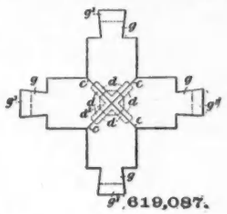
619,033. COMBINED SUBMERGED LIFTING AND FORCE PUMP. Hubbard D. B. Williams and Carl F. Grueninger, Mansfield, Ohio. Said Williams assignor of his right to Arnold Kallmerten, same place. The combination with the barrel having its lower and upper ends screw-threaded and having valve-controlled caps secured thereon, of a hollow piston-rod having inlet and outlet openings therein and having a piston upon its lower end consisting of the rigid cup-shaped head, the movable sleeve having the flange with the packing-ring upon its outer edge adapted to contact the side of the pump-barrel, and a cap secured in the lower end of the piston-rod to limit the movement of the movable sleeve upon the piston-rod.

619,037. PYROXYLIN IMITATION OF MOSAIC AND METHOD OF MANUFACTURING SAME. Joseph R. France, New York, N. Y. Assignor to the Arlington Manufacturing Company, same place. The process consists in forming pieces of said compound of different colors, form and size, dipping said pieces in a suitable dye dissolved in a solvent of pyroxylin, placing the dipped pieces in a press and pressing them into a cake.

619,044. ASSAY FURNACE. William Hoskins, Chicago, Ill. The combination of a rear crucible-chamber, a lower combustion-chamber in front of and opening at its inner end into the crucible-chamber, and a muffle-chamber surmounting and communicating through its base



619,044.



619,087.

with the combustion-chamber and opening at its rear end into the crucible-chamber and provided with a discharge-outlet for the products of combustion for all the chambers.

619,076. MACHINE FOR MANUFACTURING METAL WOOL. Sigmund Feust, New York, N. Y. The combination with a support for the roll of sheet metal, of a cutting-tool supported in position to engage the end of the roll and strip therefrom thin filaments of metal, said support and cutting-tool having a movement of rotation one relatively to the other, and a guard in a plane in advance of the cutting-tool, said guard and tool having a movement for adjustment relatively one to the other to regulate the depth of cut of the tool.

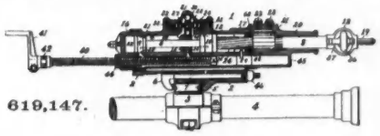
519,087. DIE FOR MANUFACTURING OR SHARPENING STAR-BIT ROCK DRILLS. Harry O. Palmer, Bolton, England. Dies for manufacturing or sharpening star-bit rock-drills, each die having a beveled working face formed of two surfaces at right angles to one another and each surface having a recess which gradually dies away from its maximum depth at the outer end of the die, the deep end of the recess being beveled transversely to the axis of the die.

619,094. EXTRACTING METALS FROM THEIR ORES AND APPARATUS THEREFOR. James J. Shedlock, London, England. Assignor to the Mudros Syndicate, Limited, same place. The improved process consists in delivering finely-divided ore in a shower into a calcining-chamber, heating the ore to the required degree as it falls and also subjecting it while descending to the action of successive fluid sprays issuing at varying points from top to bottom of said chamber, then passing the ore so treated between suitable grinding and feeding rollers and separating the metal from the gangue and tailings.

619,123. CASTING ARMOR PLATES AND MOLD THEREFOR. William Beardmore, Glasgow, Scotland, and Henry V. Holden, London, England. The combination with a mold for casting metal plates having their opposite sides of different degrees of hardness, of a series of cooling pipes, a common return or outlet pipe at one side of the mold with which all of said cooling-pipes communicate, a supply-pipe and valves.

619,144. WIRE-ROD MILL. Patrick L. Day, Cleveland, Ohio. A roll-mill having a continuous train, a finishing-train divided into separate continuous trains, and loop-trains between the continuous train and the first part of the finishing-train and between the two parts of the finishing-train.

619,147. ROCK DRILLING MACHINE. William A. Doble, San Francisco, Cal. In a rock-drilling machine, an actuating-cylinder divided into two parts, two single-acting pistons therein, a division in the center of the cylinder, means to distribute air or steam on each



619,147.

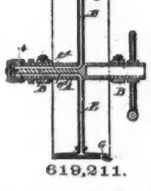
side of this division and against the inner ends of the two pistons, and to exhause the same, a longitudinal chamber 45 beneath the main cylinder in communication with the outer ends of the pistons and with the exhaust-way 60.

619,149. WATER WHEEL. William A. Doble, San Francisco, Cal. A bucket for a tangential water-wheel, in quadrilateral dish form, with rounded concave corners, having a central dividing-wedge in the plane of the wheel, and a clearance-passage for the stream at the terminus of said wedge.

619,191. COAL-LOADING APPARATUS. James L. Lamb, Trinidad, Colo. The combination of a trestle, a rack mounted thereon, a carriage mounted to roll on the trestle, and gearing to operate the carriage.

619,208. STONE-CUTTING MACHINE. John McLachlan, Denver, Colo. The combination of a stationary frame, a vertically-adjustable reciprocating frame mounted thereon, saws attached to the last-named frame, another vertically-adjustable reciprocating frame also mounted on the stationary frame, mold-cutters attached to the last-named frame, and a suitable connection between the saw-frame and the mold-cutter frame.

619,211. FILTERING APPARATUS FOR SEPARATING GOLD AND SILVER BEARING SOLUTIONS. Askin M. Nicholas, Bulong, Western Australia. The combination with a revolving wheel having peripheral closed compartments and provided with a circumferential covering of filtering material, of an exhaust-pipe having one end open to a portion of the wheel-shaft and successively communi-



619,211.

cating with separate longitudinal passages in said shaft as the wheel revolves, a series of hollow spokes leading from said shaft-passages to the peripheral compartments, means for feeding the substance to be filtered upon the filtering material on the upper side of the wheel as the latter revolves, and water-supply pipes to spray water upon said substance.

PERSONAL.

Mr. P. B. Thornton, of Williams, Ariz., is in San Francisco.

Mr. Clarence King has been visiting mines about Rossland, B. C.

Mr. William Emery has been appointed superintendent of the Utica Mines, at Angels Camp, Cal.

Mr. Richard A. Parker, mining engineer, of San Francisco, is now in Utah examining some mining properties.

Mr. M. P. Boss, mining engineer, of Mexico City, is in San Francisco, having returned from an extended trip to Europe.

Messrs. T. G. Blackstock and G. Goodman are in Rossland, B. C., in the interests of the War Eagle and Centre Star Mining Companies.

Mr. John T. Milliken, superintendent of the Colorado Ore Reduction Company mill at Arequa, will resign, to take charge of a property in Missouri.

Mr. John Q. MacDonald of Chicago has about completed for the Rose Gold Mining and Milling Company, at Victor, Cal., a cyanide mill of 80 tons' daily capacity.

Mr. H. Gardner, general manager of the firm of H. R. Merton & Co., of London, one of the largest dealers in metals in England, has been in Pittsburg, Pa., on a business errand to the Carnegie Steel Company.

Mr. W. B. Poland has been appointed engineer of construction of the Baltimore & Ohio Southwestern Railroad. He was formerly assistant engineer maintenance of way on the Chicago division of the Big Four.

Mr. J. A. Czizek has resigned his position as manager of the Idaho Consolidated Company to accept the place of State Mining Inspector of Idaho. Mr. Czizek enters on his duties as State Mining Inspector immediately.

Mr. S. W. Perce, who is credited with having located a number of the gold mines in the Coolgardie District, West Australia, now worked by the Great Boulder Company, has been in Pasadena, Cal., having recently returned from British Columbia.

OBITUARY.

John Adams Emerick died at his home in Langhorne, Pa., February 17th, aged 71 years. He was born at Hudson, N. Y., and went to Philadelphia when 19 years of age. At the age of 30 he established the then new business of separately manufacturing foundry facings and supplies, and continued in this business until 6 years ago. He was at one time president of the Eureka Cast Steel Company.

Alexander P. Stirling died at Canajoharie, N. Y., on February 9th, aged 66 years. His father, James Stirling, was one of the early settlers of Jefferson County, and owned a number of iron mines and furnaces there. Alexander Stirling spent most of his life in the iron trade. In the early 80's he went to the Black Hills, South Dakota, where he purchased considerable mining property, much of which he held at the time of his death.

R. H. Johnson, general manager of the Columbus & Hocking Coal and Iron Company, died of apoplexy at his home in Columbus, O., on February 15th. Mr. Johnson was born in a New England coast town on April 14th, 1844, and lived practically his whole life in the East. He went to Columbus in 1893 to assume the duties of general manager of the Columbus & Hocking Coal and Iron Company, succeeding W. E. C. Cox, which position he held till his death.

Edward Simeon Hayden, the inventor of the Hayden Process for the electrolytic separation of precious metals from copper, died in New York city February 14th, after a long illness, at the age of 49. His permanent home was in Waterbury, Conn., where for several years he was secretary and assistant treasurer of the Holmes, Booth & Hayden Brothers Company. He afterward went to Bridgeport, Conn., where he invented and perfected his process of separating precious metals from copper. This process is now in use at some of the largest copper refining works in this country, among others the Baltimore Copper Smelting and Rolling Company at Baltimore, Md.

SOCIETIES AND TECHNICAL SCHOOLS.

University of Tennessee.—The January number of the "University Record" contains the reports of the board of trustees, president and the heads of the various departments. The number gives a full statement of the work required in the various departments of the university and shows the advantages offered by the institution to the young men of the South.

Massachusetts Institute of Technology.—Mr. H. F. J. Porter, of the Bethlehem Iron Company, addressed the Society of Arts February 16th on "Modern Forging." He presented in an interesting way, with numerous illustrations by the stereopticon, the methods in vogue at the Bethlehem Works of forging such articles as hollow and solid shafts, dynamo field rings, guns, armor plate. Views were shown of the hollow shafts of the "Oregon" and of the "Brooklyn," made at these works. Defects in the old methods of forging and the steps leading to the present methods were explained.

Engineers' Club of St. Louis.—At the meeting on February 15th, 43 members and 20 visitors were present. Messrs. Chas. A. Tripp and Geo. H. French were elected members of the club. Messrs. Bryan, Laird and Connor were nominated as a member of board of managers of the Association of Engineers' Society, and Mr. Bryan was selected.

Mr. M. L. Holman then opened the discussion of the evening on the "Chicago Drainage Canal," giving a brief description of main features of Chicago's sewerage system, the Chicago River and the canal itself. He also read parts of the law, giving the provisions for the construction, and taxation to pay for it. Mr. R. E. McMath further elaborated the subject, showing the relation of the Desplaines River, the Illinois & Mississippi Canal and the Drainage Canal. He also discussed some of the earlier attempts of Chicago to gain relief from the sewerage. The effect of the canal in a commercial way was touched upon. Mr. Holman added some further remarks on the engineering fallacies of the scheme as undertaken. He stated that the original plans had not been followed out and mentioned that the Chicago engineers themselves do not see the way clear to successful fulfillment of the original expectations. Mr. Colby also added a few remarks.

Lehigh University.—The register of this university at South Bethlehem, Pa., for the year 1898-99, shows few changes in the governing or teaching force. The new professorship of history and economics has been filled by the election of Mr. John L. Stewart, late lecturer in that department. The department of Mechanical Engineering has lost the services of Messrs. B. H. Jones and L. Q. Danse as instructors, and their places are filled by Messrs. L. N. Sullivan and J. C. Peck. Mr. Joseph Barrell has been elected instructor in geology and lithology.

Solid geometry has been added to the requirements for entrance to the Latin scientific course and to that in science and letters, and it is announced that in 1900 and thereafter the requirements for entrance to the course in science and letters or to any course in the School of Technology will include plane trigonometry and logarithms through the solution of right and oblique triangles. The elective system has been extended to the Latin scientific course, so that it now seems possible for a student in either of the literary courses to complete in 6 years the general training of the literary course and the special training of a professional course, thus in the end being much better equipped for professional work than one who had taken the technical course alone. In civil engineering the student may elect a large amount of work in architecture. In mechanical and in electrical engineering a large proportion of the work is identical and students in either course may elect a considerable amount of special work in the other course.

The register includes a complete list of the university's graduates during the 33 years of its existence. The total number is 1,028, of whom 981 are still living. A large proportion of the members of the class of 1898 are reported as actively engaged in the practice of their professions, and about one-half of those not so reported are engaged in graduate study at Lehigh or elsewhere.

INDUSTRIAL NOTES.

The A. B. Farquhar Manufacturing Company, of York, Pa., shipped recently two carloads of tank plates to South Africa.

The Alabama Steel and Wire Company, Ensley City, Ala., has awarded the contract for 14 boilers to the Stirling Company. The boilers will furnish 6,000 H. P.

The Brooks Locomotive Works, of Dunkirk, N. Y., have secured a contract for forty 10-wheel locomotives and eight 12-wheel locomotives for the Union Pacific Railroad.

The American Impulse Water-Wheel Company, of New York, reports that its home and foreign business is good. The company has some very large work on hand for electric power transmission.

At the annual meeting of the Niles Tool Works, Hamilton, O., the old Board of Directors was re-elected, with the exception of T. F. Gaff, of Cincinnati, who resigned and was succeeded by Willis E. Hall.

The West Duluth Furnace of the Duluth Iron and Steel Company, Duluth, Minn., is under option for lease and with it considerably more land for additional works. The furnace has been idle several years.

The Shaw Electric Crane Company, Muskegon, Mich., has an order from the Pressed Steel Car Company, of Pittsburgh, for 14 electric traveling cranes of 7½ tons capacity each, which will be installed at the Schoen plant.

The Lackawanna Iron and Steel Company has announced an increase of 10% in the wages of all employees of the company at Colebrook, North Cornwall, and the 2 Bird Coleman furnaces at Cornwall, Pa. About 400 men are affected.

The 3 Thew automatic steam shovels built for the Lorain Steel Company by the Thew Steam Shovel Company, Cleveland, O., the work being done at the Variety Iron Works, Cleveland, have been delivered to the ore yards of the Lorain Steel Company, at Lorain.

The National Gas Machine Company, Moline, Ill., has been incorporated with a capital stock of $20,000 to manufacture and sell gas machines and appliances. The incorporators are W. L. Velie, William Butterworth, S. S. Poole, J. E. Poole, S. D. Poole and P. C. Simmon.

It is stated that the 2 blast furnaces that have been under erection for some time by the Ohio Steel Company, at Youngstown, O., will be completed by the National Steel Company. The two furnaces are to be 105 ft. high and 23 ft. diameter at the bosh, and will be the largest in the world.

The Chapman Valve Manufacturing Company, Indian Orchard, Mass., has elected the following officers: President, James D. Safford; treasurer, Henry R. Dalton, Jr. Directors: James D. Safford, H. K. Wight, Henry S. Lee, E. A. Carter, Joseph W. Smith, W. F. Brown and Henry R. Dalton, Jr.

The firm of Cramer & Burt, Chicago, has placed a considerable number of its plain copper and silver-plated amalgamating plates since the first of the year among the mines of Colorado and other Western States. Cramer & Burt has added mining supplies to their already large business in metals.

The Lackawanna Iron and Steel Company of Scranton, through their manager, Frank L. Grammer, announced an increase of 10% in the wages of all the employes in this vicinity. The two Colebrook, two Bird Coleman and North Cornwall furnaces are affected and several hundred men are interested.

The Sheffield Coal, Iron and Railroad Company, Sheffield, Ala., has recently added a new Weimer engine to its blowing plant. It has a 50-in. steam cylinder, 96-in. tub with a 5-ft. stroke. The reopening of the West Point brown ore mines, Lawrence County, Tenn., will add other sources of brown ore to those already used by the company.

At the annual meeting of the stockholders of the New York & Cleveland Gas Coal Company the former board of directors and officers was re-elected, as follows: Directors, H. Phipps, Jr., Frank Semple, W. H. Berger, J. T. Hamilton, John Walker, James J. Donnell, J. Dennison Lyon, William P. De Armit, C. E. Wales; president, W. P. De Armit; treasurer, Frank Semple; secretary, C. L. Dixon.

The Weimer Machine Works, Lebanon, Pa., has recently booked an order for a 200 cu. ft. capacity cinder car for a furnace in England, and completed several other shipments of cars to English furnaces. The company has also secured an order from the Stewart Iron Company, Limited, Sharon, Pa., for a Weimer blowing engine, having a 50-in. steam cylinder, 96-in. blowing cylinder, with a stroke of 60 in., to be of the poppet valve type, fitted with patent cut-off governor.

Among recent orders taken by the Dickson Manufacturing Company of Scranton, Pa., is one from a Central American Railroad Company calling for three hopper firebox locomotives. The Sante Fe Railroad Company placed an order for 25 freight locomotives, Mogul type, and 10 first-class passenger engines. Three locomotives were recently shipped to Russia. The Delaware & Hudson Company wants 10 freight locomotives and one large company a Mogul locomotive of a special type.

The Delaware & Hudson Railroad has placed an order with the Schenectady, N. Y., Locomotive Works for 10 consolidation freight locomotives with wide fireboxes, specially designed for burning culm, cylinders 21 by 26 in., weight 130,000 lbs. on drivers, total weight 150,000 lbs., also 5 engines of the same type, but much heavier, having cylinders 22 by 28 in., weight 160,000 lbs. on drivers, total weight 180,000 lbs. The last 5 are to be used as pushing locomotives on heavy grades.

The Snow Steam Pump Company, of Buffalo, reports several recent orders from Havana. The company is finishing its contract for the pumping machinery for a Russian battleship and a

Russian cruiser and has a contract for pumps for the new "Maine." Two large contracts for machinery for Japanese mining districts are being filled and contracts are on hand for a 15,000,000 gal. triple expansion engine for the Calumet & Hecla Mine, and a 10,000,000-gal. pump for the Tidewater Pipe Line.

The Goodwin Car Company, New York City, has at present under construction a number of 80,000 lbs. capacity steel cars, gravity, center and side-dumping cars, equipped with hand and air dumping apparatus. These cars are leased to several of the large railroads and are principally used for coal, ore and broken stone. The cars have hammered iron M. C. B. standard axles, with 5 by 9 in. journals, Gould undertrip couplers, Goodwin twin spring draft rigging, ball center plate and truck bolster.

At a meeting of the newly organized General Chemical Company on February 15th, in New York, these officers were elected: President, William H. Nichols; first vice president, George W. Kenyon; second vice president, Frederick Phillips; treasurer, James L. Morgan, Jr.; secretary, Charles Robinson Smith; assistant secretary, J. Herbert Baggs; chairman executive committee, Sanford H. Steele. The New York office of the company will be in the suit of offices now occupied by the Nichols Chemical Company.

The Westinghouse Electric and Manufacturing Company has received a contract from the Mt. Whitney Power Company of Visalia, Cal., for the construction of electric machinery to be used by the Mt. Whitney Power Company for a large irrigation system. The central power station of the company will be located at Visalia, and substations, from which water will be pumped from artesian wells, will be located at Visalia, Lemoncove, Lindsay, Porterville and Tulare. The machinery and appliances to be furnished by the Westinghouse Company will cost, it is said, about $300,000.

Messrs. Charles H. Besly & Co., of Chicago, report numerous large orders for "Helmet" oil and perfection and bonanza oil cups. Among other shipments made have been some to the J. I. Case Threshing Machine Company, Pullman's Palace Car Company, Crane Elevator Company, Brown Hoisting and Conveying Company, Cleveland Machine Screw Company, Gormully & Jeffery Manufacturing Company, and the Pope Manufacturing Company. The last two firms use this oil for assembling wheels, coating steel balls, as well as for ball bearings and other wearing parts with it. The Pope Company uses the oil on its chainless bicycles. The McCormick Harvesting Machine Company, Otis Elevator Company and American Steel and Wire Company are ordering "Bonanza" oil cups for use on machinery.

The Bessemer Steamship Company has ordered 4 large steel freighters, 2 steamers of 6,250 each, and 2 tow barges of 7,250 tons each. With 2 other vessels for the Bessemer fleet—1 at Cleveland and 1 at West Superior, Wis., already under way, the aggregate value of Rockefeller orders is fully $1,250,000. Of these 4 last ships, none of which are to be delivered until April, 1900, 3 will be built by the American Steel Barge Company of West Superior, and 1 by F. W. Wheeler of West Bay City, Mich. The West Superior Company gets a steamer and a tow barge, and F. W. Wheeler a steamer. The ships will each be 10 ft. longer than their predecessors. This will bring the length of the steamers up to 486 ft. over all, and the barges to 466 ft. Otherwise they are to be duplicates, excepting in minor improvements, of the steamer "Morse" and barge "Roebling."

Hingston & Wood, of Buffalo, N. Y., who have the contract for dredging the Portage Lake Canal on Keweenaw Point, in upper Michigan, are having a very large bucket dredge built at their yard in Buffalo. The dredge is 136 ft. long, 42 ft. 6 in. beam and 13 ft. 6 in. depth. The height from keel to top will be 32 ft. The machinery was built by the Bucyrus Steam Shovel and Dredge Company, of South Milwaukee, Wis. It consists of 2 double high pressure engines, 18 by 24, and 2 swing engines, 12 by 16, for swinging the dipper. The backing engines for pulling the boom into position are 10 by 16 in. The main shaft is 13 in. in diameter. The intermediate shaft, which extends entirely across the boat, is 8 in. in diameter and operates the speed hoist. A frame forward is 53 ft. high and the crane is 53 ft. long. The hoisting cable is of steel, 2¾ in. in diameter, and runs over 8 ft. sheaves. The dipper has a capacity of 8¼ cu. yds. The largest dippers previously built were used on 2 dredges at the world's fair and had a capacity of 8 cu. yds. each. The boom weighs 35 tons. Farrar & Trefts, of Buffalo, will fit the dredge with return flue marine boilers, 8½ by 12 ft. in size, and capable of a working pressure of 150 lbs. Coal bunkers with a capacity of 150 tons are ranged on the sides of the lower deck. Suitable quarters are provided for a crew of 19 men. There will be a complete electric light plant on board, and a carpenter and blacksmith shop. The dredge must, according to the contract, be able to raise one full load from water 25 ft. deep every 45 seconds, or, in other words, have a capacity of 15,000 tons per 10 hours.

The Riter & Conley Manufacturing Company, of Pittsburg, has just been awarded the contract by the Pressed Steel Car Company for the erection of its mammoth steel car plant buildings at a cost of $250,000. The plant will be entirely of steel, and will be so arranged as to secure the most economical methods of handling material. It will be the most modern obtainable, and will be erected this year. The contracts for the heavy machinery for the big plant have already been awarded. The plant will cover 11 acres and will consist of six separate buildings, arranged in a continuous system, three of which will be monster affairs. The largest building will be the construction department, 220 ft. wide and 750 ft. long. It will contain the hydraulic presses, punches and riveting machines. Two 800-ton presses will be installed and the other presses will range in smaller sizes down to 100 tons. Another large building will be the erection department, which will be a steel building 200 ft. wide and 500 ft. long. This building will contain railroad tracks on which the steel cars will be put together, the steel bed to be made in the new shop and the trucks and frames at the Allegheny shops. The third large building will be the paint shop, where the newly-built cars will be painted and lettered. This will be 200 ft. wide and 250 ft. long, and will adjoin the erecting shop, so that cars can be moved quickly from one to another. A machine shop for the repairing of tools and machinery, a pattern shop and a blacksmith shop will also be added to the system. These buildings will not be as large as the major three, but will not be small. The buildings will be rushed to completion, and will be able to turn out finished every day 40 steel cars of the largest capacity. This will be slightly larger than the present plant in Allegheny, and will make the total capacity of the works 75 cars a day.

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.

ALASKA.

Copper River.

Prospectors who have straggled back from the interior during the winter fully confirm the statements as to the worthlessness of this district published in the "Engineering and Mining Journal" last spring. The many men who rushed into the district have succeeded in finding nothing of value. Panning shows colors along many streams, but the values are altogether too small to pay. At last accounts 150 miners at Copper Center, 150 miles from Valdes, were preparing to push forward to Franklin Gulch, 350 miles distant, on the head waters of Forty-Mile Creek, which flows into the Yukon.

ARIZONA.

Graham County.

Arizona Copper Syndicate, Limited.—This company owns eight claims in the Clifton District, adjoining the properties of the Arizona and the Detroit Copper companies. The capital stock is $500,000, in $5 shares, and the company is now offering 20,000 shares for sale at $2.50 a share. Some development work is said to have been done on the property.

Maricopa County.

New Vulture Mining Company.—This company is working the Vulture Mine, near Phoenix. A new shaft, down 215 ft., is reported to have some rich ore. It is stated that the company intends to replace the old 80 stamp mill on the property with a modern 50 stamp mill. An electrical power and transmission plant will also be put in, and water pumped from the Hassyampa River. The tailings from the old mill are being treated by cyanide. Joseph C. McKee is manager.

CALIFORNIA.

Amador County.

Alameda.—This mine, near Jamestown, is owned by Chicago parties. The shaft is down over 950 ft. Steam power is used, and a Fraser & Chalmers 20-stamp mill has been running steadily since the middle of October. The waste water from the mill is caught by dams which impound the tailings, and the water is used again. Burleigh drills are used in the mine. Austin J. Doyle, vice president of the company, is general manager.

Peerless Gold Mine Development Company.—This company has been organized in Jackson to develop a lode property between Jackson and Middle Bar. The capital stock is $150,000 in $2 shares. The officers are: H. Osborne, president; G. G. Gates, vice-president; E. Ginocchio & Bro., treasurer; W. E. Downs, manager, and George W. Brown, secretary; the directors being H. Osborne, G. G. Gates, E. Ginocchio, George W. Brown and W. E. Downs.

(From Our Special Correspondent.)

Balliol.—At this mine, near Sutter Creek, the shaft is down 350 ft., and will be continued to the 500-ft. A level is being run on the 300-ft. An air compressor to run drills is in operation. Good ore from the 200-ft. is being crushed by the 40-stamp mill. S. R. Porter is superintendent.

South Spring Hill.—This mine, at Amador City, will soon be running with a full force of men, the injunction having been raised. J. R. Tregloan is superintendent.

Butte County.

(From Our Special Correspondent.)

North Star.—This old mine, near Enterprise, is being worked under the management of the owner, A. T. Slater. A dam is to be built on the South Fork of the Feather River, and an electric power plant put in to operate the mine in case the water supply runs short again.

Calaveras County.

(From Our Special Correspondent.)

Gold Cliff.—At this mine, southwest of Angels, the old mill is undergoing repairs and the machinery at the Thorn Mine is being moved over. The new shaft is now down 40 ft. At 900 ft. it will strike the old Madison workings. The rock taken out is crushed at the Madison mill.

Murray Hill.—This property, 7 miles east of San Andreas, near Mountain Ranch, is being developed by tunnels, which have cut 4 different ledges, the largest being 4 ft. wide. Assays are said to run from $20 to $60 per ton. The plant comprises a 5-stamp mill, concentrators, etc. C. Jensen is superintendent.

Sheepranch.—This mine, at Sheepranch, 12 miles northeast of San Andreas, has closed down on account of liens filed against the property. The mine is said to be good by those who worked in it years ago. It is now full of water.

El Dorado County.

(From Our Special Correspondent.)

Gold Note.—At this mine, in the Grizzly Flat District, 28 miles from Placerville, a 10-stamp mill has been erected and development work is going on on a large scale. The ledge shows fair grade ore.

Inyo County.

(From Our Special Correspondent.)

Blue Bell.—This mine, in Snow's Canyon, 14 miles southeast of Darwin, at an elevation of 5,000 ft., is worked through a tunnel on the vein. At present water is conveyed from the spring in the canyon up the hill 1,200 ft. to the mine by a windlass. John C. Cress is the owner and operator.

Goodmark & Harrison.—This firm is erecting a 10-stamp mill, building a tramway and developing water near Ballerat. The machinery, supplies, etc., are hauled in by way of Johannesburg.

Nevada County.

(From Our Special Correspondent.)

La Suerte.—The shaft at this mine, near Nevada City, is down 350 ft., and a level run about 300 ft. to intersect the downward extension of the veins encountered above. The ledges, which are prospected to a depth of 150 ft. from the surface, show from 1 to 2 ft. in width, carrying high grade free milling ore. The plant consists of a steam hoist, 5-stamp mill, Wilfley concentrator, etc. W. W. Kirkham is superintendent.

Odin.—At this drift mine, 1¼ miles north of Nevada City, a gravel dump is being built and sluices put in preparatory to starting up.

Placer County.

Pioneer Mining Company.—The January statement is: Tons of rock crushed, 536; average value rock, $11.13; gold bullion produced, $5,962; total expenses, $5,458; net earnings, $502.

(From Our Special Correspondent.)

Big Dipper.—At this mine, 2 miles southeast of Iowa Hill, the reservoir recently broke, and the mill, blacksmith shop and drying house were destroyed and 6 men were killed. The loss will be about $25,000. This property is considered one of the richest gravel mines in the district. A large amount has been spent in improvements. The estate of the late Columbus Waterhouse is owner.

Riverside County.

(From Our Special Correspondent.)

Gold-bearing ledges are said to have been discovered in the Mountain Beauty Mining District, which skirts the foothills of the Chihuahua Mountains. The district is partly in San Diego County, about 40 miles from Hemet, near Oak-

wood P. O. The first location was made by Johnson & Savage in 1896, who quit work, believing the vein had pinched out. The 2 tunnels on the Mountain Beauty claim are in ore and the crosscut is said to show 20 ft. of ore running over $10 per ton, while specimens go much higher. The claims recently located in the district are the Helen, Progress, Annex, Lizzie, Valley View, Jessie L., Maria, North Extension, South Extension, Alturas, Golden Link, and Virginia. Timber and water in the vicinity are abundant.

Sacramento County.

(From Our Special Correspondent.)

On February 11th the large dredger which will work the river bed along the American River, at Mississippi Bar, 4 miles below Folsom, was launched. This dredger, built by the Risden Iron Works, of San Francisco, can handle 2,000 cu. yds. of gravel per day, at an estimated expense of 6c. per cu. yd. Messrs. W. P. Bonbright & Co., of Colorado, who own it, have bonded about 100 acres of gravel deposits along the river. This gravel is estimated to yield 18c. per cu. yd.

San Bernardino County.

Rose Gold Mining and Milling Company.—This company, at Victor, has almost completed an 80-ton cyanide mill. It is expected that the plant will be in operation about March 10th.

San Diego County.

(From Our Special Correspondent.)

Helvetia.—E. Moore, of Denver, Colo., and associates have an option on this property, 1½ miles southeast of Julian, and the water is being pumped out and portions of the main shaft retimbered. The mine is to be put in condition for an expert examination. A large force is employed. This property is said to be a rich free milling proposition.

Shasta County.

(From Our Special Correspondent.)

Salt Creek.—The Corinne, one of this group of mines, 4 miles west of Redding, is showing up well, a 4-ft. vein of high grade ore having been struck. Most of the development work has been done on the Bonanza claim heretofore.

Tuolumne County.

(From Our Special Correspondent.)

Leap Year.—This gravel mine, on Table Mountain, has been bonded by Cook, Berry & Co. for $15,000, and several men are at work under C. Hawley. The property is considered very promsing.

San Guiseppe.—A company consisting of Los Angeles, San Francisco and Sonora parties are to reopen this mine, ½ mile west of Sonora. The shaft, which is down about 225 ft., will be pumped out, a hoist erected and sinking resumed. The record of this property is good, the ore being high grade.

COLORADO.

Boulder County.

Boulder County.—This mine at Caribou, which is worked from a tunnel now in 600 ft., has 50 men employed, and is turning out 30 tons of ore a day. A recent mill run of 3,000 tons of ore gave returns of $16. As soon as the weather permits the Midget mill will start on ores from this mine.

Cash.—This mine, at Gold Hill, recently opened into a large body of rich ore. Twenty years ago it was regarded as one of the best mines in the county. It has not been operated for several years until within a short time.

Golden Age.—Some very rich ore has been opened in the 400-ft. level of this mine at Jimtown. L. J. Talbot is superintendent.

Mogul Tunnel.—Work on this tunnel, being driven into Spencer Mountain near Eldora, continues. At a point 900 ft. in a branch to the southeast has been driven over 100 ft. Another branch is to run southwest. About 30 veins have been cut so far from a few inches to several feet thick, and of varying richness. Ore bins are being erected and the force of men is to be increased.

Village Belle.—The shaft at this mine, on Spencer Mountain, just south of Eldora, is reported down over 200 ft., while about 400 ft. of levels have been driven and an upraise 112 ft. to surface for a second escape. But little stoping has been done. The vein is said to be 3 to 5 ft. wide, and the pay streak 6 in. to 2 ft. wide. The ore is largely sylvanite and petzite, and some of it is very rich. Only about 20 men are employed under W. B. Jenness.

Chaffee County.

Sedalia.—The output of this copper mine is now from 15 to 20 tons per day.

(From an Occasional Correspondent.)

Eclipse.—This mine at Monarch, an old producer, is worked under bond and lease by ex-Senator C. H. Abbot, with a force of 30 men. The property has been idle several years.

Madonna.—This mine at Monarch, once a great producer, is at the present working only 7 men to take out manganese ore for flux for the Colorado Smelter at Pueblo.

Mayflower.—This group belongs to the Columbia Gold Mining and Milling Company of Elmira, N. Y., of which J. L. Worrall is president. There is a 100-ft. shaft on a vein carrying hematite, manganese and iron pyrites, which runs of an average value of $12.50 per ton in gold. A tunnel is being driven to connect with this shaft at a vertical depth of at least 375 ft. This tunnel is in 85 ft. This group lies 7 miles north of where Big Badger Creek empties into the Arkansas River

Sedalia.—This copper mine near Salida is worked under bond and lease by Chas. Brooks with about 15 men. Regular shipments of ore are made to Pueblo smelters. This is a very old mine, and for some years has been a great producer.

Whitehorn Turret District.—Great activity prevails, and many prospects are opened with encouraging veins. The Little Johnnie has been leased for $20,000. Machinery has been ordered at Denver, and is the way.

A good strike of rich gold ore has been made below Turret in Cat Gulch. There is a vein six ft. wide, with a pay streak of about 12 in. wide.

Dr. F. McClure of Salida, near Garfield, has opened a 15-in. vein of honeycombed quartz in granite, which assays from 3 to 9 oz. in gold. Several tons have been shipped to the Pueblo smelters.

Clear Creek County.

(From Our Special Correspondent.)

Corry Mining Company.—The shaft building and machinery of this Silver Plume were swept away by a big snow slide, which occurred on the morning of February 12th. The Pelican-Dives sustained slight loss. The slide came a mile and swept several cabins away. So far nine bodies have been recovered and one body remains. Three miners were injured. Manager C. S. Desch, of the Corry City, has placed an order for a gasoline hoist for the 800 ft. shaft. The mineral is lowered to the Diamond Tunnel, so that power is needed only in raising the empty hoist.

Empire City.—The Forest City Company has begun sinking a shaft on the Empire Vein, and has cut some small gold-bearing streaks. It is the intention to drive levels to open the ore body to one side of the shaft.

Knickerbocker Tunnel.—A strike of copper ore has been made in this bore and the pay streak of the vein is 20 ft. wide. Of this 3 ft. is smelting ore. That heretofore followed has been milling ore. The strike was made in the Emerson ground. The vein is the same as the Crown Point, which lays 2,000 ft. to the east.

Lord Byron.—The Nebraska owners of this mine have been at Idaho Springs, putting in a new plant of machinery, including a larger boiler and hoist. Sinking will be resmued within 10 days. The entire width of the bottom of the shaft is in high grade ore.

Mammoth Tunnel.—It is reported that a very rich body of ore has been cut at the breast of this bore, which is pushing towards the veins of the Alps Mountain, but those in charge make a denial. Regardless of this, it is pretty certain that a good find has been made.

Pelican-Dives.—A shaft is being sunk on the Bismarck vein of this group. In the shaft the ore streak is 18 in. wide and runs 450 oz. silver to the ton. Other silver mines in the same locality are also outputting grade mineral, and some development has been undertaken in each one.

Puritan.—In sinking on this vein at Yankee, J. R. Gow has opened a streak of smelting ore that runs $300 per ton.

El Paso County—Cripple Creek.

(From Our Special Correspondent.)

January Output.—The output for January was 31,640 tons of ore, of the total value of $1,264,750. Of this 9,472 tons, of the value of $75 per ton, making $710,400, went to smelters, and 22,174 tons of the value of $25 per ton, making $554,350, were treated by the chemical mills. The tonnage of the milling ore shows somewhat of a decrease over December, probably due partly to bad weather and partly due to the expiration on January 1st of several heavy shipping leases, notably those of the Hull City Placer. The increase in the value per ton of the smelting ore is due to the very rich ore sent out by the Isabella. The dividends paid by the principal public stock companies were as follows: Portland, $60,000; Gold Coin, $10,000; Anchoria-Leland, $18,000; Vindicator, $50,000; Lillie, $11,125. Total, $149,125. This does not include those paid by close corporations and mines owned by private individuals, such as the Strong, Independence, Golden Cycle, Modoc and others.

Exchange Group Gold Mining Company.—This company has been incorporated with a capital stock of $200,000. Benjamin Wells, Gordon L. Stephens, John G. Burger and J. M. Daniels, of Bunceton, Cooper County; D. F. Nixon, of Pilot Grove, Mo.; George W. Harlan, of Otterville, Mo.; F. L. Wright, T. A. Fowler, of Smithton, Mo.; H. K. Bente, of Sedalia, Mo. The mining will be carried on in El Paso County, Colo., and Pettis County, Mo. There will be offices at Cripple Creek and at Sedalia, Mo.

Grace Greenwood.—This property has been leased to the Jersey Leasing Company, of which J. E. Birch is manager. Work has begun straightening the shaft. A new hoister and compressor are to be put in and a shaft and ore house are to be built. This is the same company that recently operated the Birch lease on the Mary McKinney property near Anaconda.

Independence Town and Mining Company.—A lease has been granted by this company to J. A. Whiting and others on block 13, known as the Vaughn and Christian lease, and work has begun. The shaft is now down between 400 and 500 ft. E. M. Ray has charge of the work for the company.

Isabella Gold Mining Company.—Considerable energy is given to opening up the 10th level in the neighborhood of the rich ore. A new plant of heavier hoisting machinery is soon to be put in on the Lee shaft.

Lillie Gold Mining Company, Limited.—It is learned from Mr. William Weston, on whose report this property was launched in London, that it is turning out better than was expected. What at present appears to be an entirely new vein was recently discovered in stoping on the eighth level west. Samples from 3 ft. wide run from 3 to 5 oz. in the screenings. If this vein goes to surface it will add materially to the value of the property. The output has not been very large of late, on account of putting in the new machinery and getting the new shaft in shape. It is expected, however, that in about two weeks the mine will ship about 40 tons per day. Francis Gilpin is in charge.

Lucky Guss Gold Mine, Limited.—It is reported on good authority that a long lease on this property has been granted to a Mr. Burris of Pueblo. This property belongs to an English company and is situated on Bull Hill, adjoining the Union Company's property. The company recently put in a new hoisting plant, but has not been working for a month or two.

Moon-Anchor.—The English company that now has control is preparing to do considerable development work. It is understood that about $50,000 is being sent from England for this purpose.

Portland Gold Mining Company.—At the annual meeting in Council Bluffs, Ia., James F. Burns was elected president, Irving Howbert, vice-president, and Frank Peck, secretary and treasurer. W. F. De Camp was chosen superintendent. An executive committee, consisting of Burns, Howbert and Harnen was also elected. The report of the officers show the mine to be in very good condition.

Prince Albert Gold Mining Company, Limited.—The stockholders, at their annual meeting in Colorado Springs, elected the following directors for the ensuing year: R. J. Preston, H. R. Devereaux, J. A. Hayes, A. E. Carleton, K. R. Babbit, R. C. Thayer and S. L. Thompson. The report of the manager shows that there are now 6 leases on the property. All the ore shipped during the year was taken out by leasers. The treasurer's report shows that the company received as royalties $3,381. L. E. Smith of Cripple Creek, is manager.

Squaw Mountain Tunnel Gold Mining and Development Company.—In the suit between this company and the Columbine-Victor Company the verdict favored the latter, giving them title to the disputed vein and damages to the amount of about $7,000. The case is over the May B. claim owned by the Columbine-Victor. The location of this claim is alleged to be prior to the tunnel. It is understood that the Squaw Mountain people will appeal the case.

Vindicator Consolidated Gold Mining Company.—The stockholders at their annual meeting re-elected the old board of directors. F. L. Seigel is president and F. J. Campbell is treasurer and general manager. The reports of the officers show the property to have done very well during the past year. The directors have let a contract to sink shaft No. 1 to a depth of 800 ft. and also for a new ore house, which will cost about $8,000. The company began the year 1898 owing $1,944. Net receipts from ore sales during the year, $401,292; total net receipts, $401,952; operating expenses, $205,947; profit for year, $195,986; permanent investments, $10,647.81; balance, $185,339; paid overdraft, $1,944.44; paid dividends in 1898, $126,875; paid dividends January 20th, 1899, $50,750; total, $179,569; balance on hand, $5,769.

Gilpin County.

(From Our Special Correspondent.)

Mining Conditions.—The roads leading to the mines and the lines of the Tramway Company are in shape again, and an unusually heavy tonnage is being handled. Several properties compelled to close down on account of lack of coal are starting up and the usual working forces will soon be employed again. The water

that will come down the creeks this Summer will help the milling interests, and the output of gold from placer gulch mining will be larger than usual.

Mining Leases.—W. O. McFarlane, Kate Nicholson and Endie Nicholson have leased to J. F. McGrew the McFarlane, Little Annie and Glasgow lode claims in Pleasant Valley District. Nate Sears has leased the East Whiting, on Gunnell Hill, from the Denver owners. Chicago capital has been interested and operations will be commenced at once.

Mining Transfers.—W. A. Hoyt to R. Beunallac, ½ interest in the Maggie and Brunswick lodes in Central District. G. Q. Adams to W. F. Page, the Springfield, Westfield and Pittsfield lodes, in Pine District. J. I. Seehorn to Chas. J. Moore, the Crown Point, Grand Trunk, Iron Clad and Little Giant lodes, in Phoenix District. W. D. Menell to J. D. Whitmore, ½ interest in the Lady Helen and Little Eva lodes, and Lady Helen mill site, and 1-3 interest in Big Ute claim, all in Silver Lake District. M. A. and A. Krautz to T. J. Lee, 2-3 interest in the Yellow Metal lode, in Central District. P. Petersen to E. L. Alexander, of Harris County, Texas, ¼ interest in the Jennie Creed placer claim of 80 acres, in Kansas District. L. Olson to O. Olson, of Wisconsin, ¼ interest in Quincy, Stockholm and Tamarack lodes, in Independent District. F. L. Schellenger to Lillie S. Schellenger, 6 interest in the Lillie Lode, in Gregory District. Hal Sayr to W. F. Allen, ½ interest in Fredonia claim, in Gregory District.

Elk Park.—This company has advertised for 500 cords of wood. The runs on the ore in the Elk Park mill have been very satisfactory, a force of 25 men is at work, and the property is opening up well, reports Manager C. L. Hathaway. Pennsylvania capital is interested.

Sterling.—A Central City pool has taken a lease and bond on this property, and will work it at once. Louis Roy will be in charge.

Hinsdale County.

Golden Fleece.—The contract for the mill is let to a Denver firm. It will be 60 by 100 ft., and its daily capacity will be 65 tons. It will be ready for business by July 1. A carload of Golden Fleece ore, shipped recently, returned $5,000.

Golden Wonder.—This mine, on Gold Hill, at Lake City, has been leased to Messrs. Johnston & Williamson, of Denver.

Lake County.

(From Our Special Correspondent.)

Mining Conditions.—The big storm lasted 25 days, but is apparently over. There is a great scarcity of mining timbers, and many mines cannot carry forward development work until timbers can be brought in. The Ibex Mines, the Resurrection and a number of others, are still lying idle, but the blockade on Ibex branch will probably be broken soon, and shipments resumed from Weston Pass and other outlying districts.

Bimetallic and Arkansas Valley Smelters.—Both plants are again supplied with coke, but neither are running full force. The former has two of its three furnaces in blast, while the latter has five out of nine going, and expects to start up the remaining four soon.

A, Y & Minnie.—A regular production of 125 tons daily from the mine is reduced by the mill to 40 tons of metallic concentrates.

Cady Mining Company.—The O. K. and Four Per Cent. claims are being developed by Thos. Ovens, lessee, who is shipping about 1,000 tons of good iron ore per month.

Garden City.—Geo. W. Cook has bought a controlling interest in the Murphy Lease, on this property, in California Gulch, and is erecting a powerful hoisting plant, preparatory to shipping manganese ore from the large bodies opened up.

Iron Silver Mining Company.—T. E. Schwartz, the new manager, is pushing work through the old Moyer shaft, and shipments have been increased to 250 and 300 tons daily.

Jay Bird Group.—The recent strike made by lessees is opening up nicely. Recent assays shows 1 oz. gold to the ton.

Leadville Pumping Association.—Within two weeks it is anticipated that the Leadville basin will be drained, and the lower workings recovered. The work will have cost the association about $75,000.

Little Bob Mining Company.—Sinking goes ahead steadily, and the big pumps are in place.

President.—Three shifts are pushing work on this Breece Hill property, near the celebrated Ballard strike. There are eight acres of ground, and the shaft is now down 525 ft., while a drift of 150 ft. follows a streak of very good ore which is daily showing an increase in its gold values.

Yak Mining, Milling and Tunnelling Company.—The tunnel started at California Gulch tunnel has bored through Iron Hill and is piercing Breece Hill. The tunnel workings are now in the Ravena ground on Breece Hill, 7,000 ft. in and 850 ft. below surface. The tunnel is 7 by 7 ft. in the clear, and has a grade of 5 in. per 100 ft. February and March shipments will be greatly curtailed.

Yankee Doodle.—Lessees on this property, owned by New York people, are now driving a drift at a depth of 550 ft. to catch a known lead ore body.

Mineral County.

Mammoth Consolidated Mining Company.—This company has been formed by a consolidation of the Mammoth, Mary Anderson and Nancy Hanks claims, on Mammoth Mountain, near Creede. The Mammoth was owned by D. H. Moffat, L. E. Campbell and Walter Cheeseman; the Mary Anderson by the estate of Job A. Cooper, Philip Feldhauser, T. E. Schwartz, N. Thatcher and W. H. Combs; and the Nancy Hanks by Dr. Buchtell, Oney Carstarphen, D. J. Hutchinson and Daniel Skinner. A tunnel has been started on the Mary Anderson, and it is the intention of the company to extend this tunnel, which will penetrate all three claims, cutting the ore bodies on the Nancy Hanks at great depth.

Ouray County.

(From Our Special Correspondent.)

American Nettie.—Fifty men are at work at this Ouray mine, and shipments average 11 carloads monthly of good grade gold ore to Denver smelters.

Bachelor.—An order has been placed for a 100-ton concentrating mill and work on the buildings for it will begin as soon as the weather clears. The mill will be on the company's ground, near the Khedive Tunnel, 4 miles north of Ouray, and will be in operation by October 1st.

Bright Diamond.—Griffith Brothers have secured a lease on this Ouray property and are sinking a shaft to catch the Iron Clad contact. Thirty ft. more will put the bottom of the shaft in good iron ore.

Bright Diamond Mill.—Ashley & Snyder have secured a lease on this plant and will start up in a few days on custom work.

Frye Smelter.—Negotiations are about completed for the immediate erection of a large lead smelter at Ironton, about 12 miles south of Ouray. Mr. Frye, of that place, is pushing the project and states authoritatively that the smelter will be built during the summer.

Pueblo.—This property, at Ironton, is producing large amounts of low grade milling ore, principally of a lead character. It is worked by 5 different sets of lessees. The product goes to local mills.

San Juan County.

Four Metals Mining Company.—This company, with headquarters in Pueblo, has acquired, it is reported, the Lackawanna group of claims on Kendal Mountain, in the Animas Mining District, one miles from Silverton. The group covers 80 acres, and comprises the J. B. Smith, Frances P. D. Lacey, D. L. & W. Free Press, T. V. Powderly, Moosic and Pu Ponxsutawaney lodes. The property was located in 1881, and worked till 1888; since then it has been idle. About 3,000 ft. of development work is reported done. The ore runs in silver and lead, with a little gold and less copper. The veins are of varying width, and in places are over 10 ft thick. A concentrating plant for the second grade ore is projected. John Norton, of Pueblo, is secretary and treasurer of the company.

FLORIDA.

Citrus County.

Dunnellon Phosphate Company.—This company has begun the construction of a standard gauge railroad from the mines at Dunnellon, Fla., to a point 18 miles below on the Withlacoochee River.

MICHIGAN.

Copper.

Wahnita Copper Mining Company.—This company has elected the following directors: James B. Fuller, president; Henry F. Whitney, vice president and secretary; F. H. Clark, treasurer, all of Boston; Joseph F. Hambitzer, of Houghton, Mich., and Kenneth K. McLaren, of East Orange, N. J. The company has opened offices both in Boston and New York. The property, comprising several hundred acres of mineral land in Ontanagon County, was formerly known as the Plutus Mine, west of the new Victoria property.

Iron—Marquette Range.

Princeton—At this mine, formerly the Swanzey, 15 miles south of Ishpeming, a large body of ore is reported discovered 150 ft. south of the present shaft. The ore is said to run 62 to 67 per cent. in iron, and about .080 per cent. in phosphorous. The mine was bought by Todd, Stambaugh & Co., of Cleveland, O., in 1898 for $85,000, and last season shipped over 25,200 tons.

Iron—Menominee Range.

Michigan.—The assignees of the J. M. Wilkinson estate have leased to the Oliver Mining Company property near Amasa. It was opened in 1892, but hard times compelled the company, which was not a strong one, to suspend. Under the Carnegie management, the property will be put in the list of active producers and worked on a large scale. The mine is a producer of soft ore similar to that of the Hemlock property near it.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The week ending Saturday, February 18th, was a notable one in the history of the mining district, Jack reaching $48 per ton, the highest price ever known in Southwest Missouri for zinc ore. Jack opened the week at $47.50, at which most of the Oronogo ore was sold, but the output of the Laura S., on the Get There lease, at Carterville, and the ore from the Pleasant Valley mines at Carthage, owned by Dermott & Cornell, sold at $48 per ton. Lead opened and closed the week at $26 per 1,000, and sales were light. The mills were in a crippled condition from the weather, but in spite of the greatly reduced output, there was a large amount of zinc ore left on hand, buyers refusing to take any more than was absolutely necessary. During the corresponding week of 1898 jack sold at $22.50 per ton and lead at $22.25 per 1,000, and the turn-in was greater by 1,757,970 lbs. of zinc and 264,220 lbs. of lead; but on account of the great advance in zinc ore this year, the value was less by $57,944. As compared with the first 7 weeks of last year, the zinc shipments show an increase of 4,494,990 lbs., but the lead sales were less by 2,434,473 lbs., the value, however, is greater by $361,877. Compared with the previous week, the sales show an increase of 2,841,980 lbs. of zinc and 362,460 of lead, and the value was greater by $75,442. Following is the turn-in by camps: Joplin, zinc, 1,329,410 lbs.; lead, 259,570 lbs.; value, $37,658. Webb City, zinc, 288,950 lbs.; lead, 38,810 lbs.; value, $7,655. Carterville, zinc, 543,730 lbs.; lead, 147,180 lbs.; value, $16,373. Oronogo, zinc, 786,730 lbs.; lead, 23,140 lbs.; value, $19,003. Duenweg, zinc, 413,950 lbs.; lead, 66,270 lbs.; value, $10,830. Hell's Neck, zinc, 3,680 lbs.; value, $74. Galena-Empire, zinc, 1,454,190 lbs.; lead, 264,000 lbs.; value, $38,856. Aurora, zinc, 675,000 lbs.; lead, 20,000 lbs.; value, $12,890. Alba, zinc, 74,600 lbs.; value, $1,753. Carthage, zinc, 52,700 lbs.; value, $1,252. Stotts City, zinc, 40,220 lbs.; value, $945. Belleville, 144,830 lbs. of zinc; lead, 1,820 lbs.; value, $3,451. Lehigh, zinc, 60,220 lbs.; value, $1,417. Central City, zinc, 355,810 lbs.; lead, 27,190 lbs.; value, $8,357. Granby, zinc, 563,000 lbs.; lead, 16,000 lbs.; value, $8,861. Total for week, zinc, 6,787,110 lbs.; lead, 863,980 lbs.; value, $169,375. District total for 7 weeks, zinc, 60,729,620 lbs.; lead, 5,981,510 lbs.; value, $1,118,420.

Lanyon Smelter Deal.—The deal for the Lanyon smelters at Iola and La Harpe, Kan., and for the coal and gas lands of the Palmer Oil Company, at Iola and vicinity, is likely to have an important bearing on the future of the lead and zinc mining industry here, and is thought to mark the formation of a great zinc trust. The transaction, it is said, was finally closed on February 17th, and the style of the new company will be the Lanyon Smelting Company. The management of the company will be in the hands of W. & J. Lanyon, who, in the course of their experience, have manipulated the market for their own profit and the discomfiture of their competitors on several different and notable occasions. The Lanyons, who are not usually communicative about their business affairs, have sought every possible occasion to inform the public through the press that the new organization is not a trust and would be of immense benefit to the district, but their statements are viewed with suspicion in many quarters, and it is said that the Matthiessen & Hegeler Zinc Company, of La Salle, Ills., and the Illinois Zinc Company, of Peru, regard the new company with great distrust, and are making preparations to oppose its operations in the district if they conflict with existing methods. The deal was made through Mr. Joseph Cappeau of Pittsburg, Pa., and the property transferred included the gas smeltery at Iola, owned by R. H. Lanyon's sons, R. H., Jr., and William; the gas smeltery at La Harpe, owned by the same parties; the gas smeltery at Iola, owned by W. & J. Lanyon; the coal smeltery at Pittsburg, Kan., owned by W. & J. Lanyon; all the gas lands and leases on gas lands owned by the Lanyons, amounting to something over 18,000 acres; also all the gas lands and leases owned by the Palmer Oil Company, amounting to over 100,000 acres. The Palmer Oil Company owned all the gas and oil lands between Iola and La Harpe, and had drilled 18 wells, all of which are now sealed up. Eleven of the wells are gas wells, and one of them is said to have a flow of 12,000,000 cu. ft. of gas every 24 hours. The Lanyons were the pioneer smelter men in this district, and have accumulated immense fortunes.

Big Kate.—This was the only mine at Hell's Neck to make a turn-in in the week ending February 18th. The mine is owned by W. B. Kane of the Bank of Carterville and others. The mill is completed, and in one shift made 3,680 lbs. of jack.

Carterville.—Col. Thomas Hill has sold a ½ interest in his 10-acre lease of the McKinley land

to Morgan & Johnson, of Muncie, the consideration being $10,000. He refused $25,000 for the other ½ interest a few days later.

Little Johnny.—This mine, on the Kohinoor tract of the Empire ground, was sold this week to T. T. Dale of Marietta, O., for $10,000. Mr. Dale has already let the contract for a 100-ton mill.

P. E. Mining Company.—The mine, mill and lease of 5 lots of this company, on the Granby land, at Oronogo, has been sold to New York parties for $100,000. The mine has only been hoisting dirt from a single shaft, and only a very small portion of the ground has been worked, but since February 16th, 1898, when the mill started, it has paid to its owners a net profit of $45,672.

The forty acres at Duenweg, on which the famous Grounds & Irwin mines are situated, has been sold to New York parties last week for $50,000. The royalties from the lessees will pay the new owners good interest on the investment.

George R. Hagenbach has sold a ¼ interest in his 80-acre lease of the Riseling land, west of Joplin, to L. D. Roebuck of Bluffton, Ind. The consideration was $2,000. There is one shaft going down over a drill hole which showed good ore, otherwise there are no developments on the land.

The 20-acre lease of the Hermit Mining Company, at Hell's Neck, has been sold for $6,500.

MONTANA.

Lewis & Clarke County.

Montana Mining Company, Limited.—The January output was 1,980 oz. gold and 5,120 oz. silver, obtained from 7,246 tons of ore crushed. The estimated return is $42,700, and the expenses were $38,400, leaving an estimated net profit of $4,300.

Silver Bow County.

Boston & Montana.—A Helena, Mont., dispatch of the 21st says: "The Supreme Court of Montana has denied the application of Boston & Montana Consolidated Mining Company, of Butte, prohibiting Judge Clancy, of the District Court, from appointing a receiver for the company on the action of Burdette O'Connor, a stockholder. The decision will not become effective for 10 days, and in the meantime the Boston ⅞ Mountain Company will endeavor to secure a further delay in the appointment of a receiver."

In its decision the Court says: "The appointment of receiver is asked as auxiliary to suit and pendente lite only. He is to take possession and manage the affairs of the corporation under the direction of the court, while the charges made by O'Connor against the trustees of the Montana company are being investigated upon trial. As a shareholder, O'Connor has the right to ask this remedy. It does not necessarily follow that the appointment of a receiver pendente lite means dissolution of the corporation or its destruction. The person to be appointed is in law an indifferent one to be clothed with power to receive and preserve the property and assets of the corporation and its shareholders for the benefit of whoever may finally be declared to be entitled to them. The principle upon which the Court may act is that it is inequitable that any party to litigation should have possession of the property of a Montana company and issues and profits thereof pending litigation in which O'Connor, as a shareholder, asks for an equitable share."

(From Our Special Correspondent.)

Montana Smelting & Mining Company.—The company has filed answer and cross-complaint to the suit brought by the Anaconda Company and asks for damages in the sum of $50,000.

Parrot Mining Company.—Another dividend of 3 per cent. has been declared. The principal mines of this company are the Parrot, Original No. 6, Little Minah and Bellona. A great deal of development work has been done on the two latter. In the Bellona a shaft has been sunk from surface. In the Little Minah great odds in the way of water and refractory rock have been met, but it is expected that the company will soon begin shipping ore from the mine.

NEVADA.

Elko County.

Tuscarora Chief Mining Company. This company, with capital stock of $200,000 in $1 shares, is to work the Eira Mine at Tuscarora. A shaft is down 200 ft., and considerable drifting has been done. The officers are: E. D. Woodruff, president; Silas A. Felton, vice president; C. O. Ellingwood, secretary and treasurer; J. E. Jackson and B. F. Redman. The headquarters are in Salt Lake City.

NEW HAMPSHIRE.

Grafton County.

Copperfield.—The copper mines at this place will, it is said, be opened again. For a month or more a firm has been working the dump, employing 25 men. There is a large amount of copper in the dump, and by a method now used it is claimed that it can be taken out with a handsome profit.

NEW MEXICO.

Grant County.

J. H. Bowen and W. E. Cavendish of Cleveland, O., have been examining the volcanic iron belt north of Hillsboro. The ore assays, according to reports, in iron, copper, gold and silver. A trial shipment is to be made to Ohio.

Butler.—This mine at Hillsboro has resumed work with 11 men.

Warren.—This Hillsboro mine has been sold to Colorado parties for $6,700. A mill is to be erected.

Mora County.

Mora Copper Company.—This company has $5,000,000 authorized capital, and principal office in New York City. The incorporators are: Robert Sherwood and Henry Crimmins, of New York City; Abel W. Tennant, of Taos; Charles B. Orvis, of Chicago, and William A. Weed, of Stamford, Conn., each of whom holds one share of $100.

NORTH CAROLINA.

Cherokee County.

Corundum Deposits.—Leverett S. Ropes is to develop corundum deposits near Murphy. A complete plant for mining will be erected, together with 75-ton crusher and other necessary equipment for concentrating and washing. Power will be supplied by impulse water wheels under 300 and 500-ft. heads. Designs for the mill are now ready.

Granville County.

Boston & Carolina Copper Mining Company.—At a recent meeting of the directors, the Executive Committee was authorized to purchase immediately an air compressor, drills and equipment, for the purpose of developing the mine with the utmost rapidity.

OREGON.

Baker County.

Pomeroy Dredging Company.—This Portland company is to work the bed of Brunt River, near Weatherby Station of the Oregon Railway & Navigation Company. Joseph Paquet, of Portland, is building the dredge boat, which will be 100 by 34 ft. The dredge will be of the bucket type, and is expected to be at work by May 1st.

PENNSYLVANIA.

Anthracite Coal.

The report of Inspector G. M. Williams for the Fifth (Wilkes-Barre) Anthracite District, states that the production for 1898 was 7,866,277 tons, while in 1897 it was 7,457,418. The extra production was caused by the unusually severe winter. In shipments there were 351,051 more tons in 1898 than in 1897. The number of employees, however, was less. The figures being 23,377 for 1898, and 25,650 for 1897. The Lehigh & Wilkes-Barre mined 112,063 less tons last year than in 1897, but the Delaware & Hudson mined 193,501 more, while the Lehigh Valley and the Delaware, Lackawanna & Western mined more than in 1897.

Philadelphia & Reading Coal and Iron Company.—Work on the new breaker at Wadesville will begin shortly. It will take about 7 months to complete the structure. The iron work is to be finished by the Pottsville Iron and Steel Company.

Bituminous Coal.

Miller's Run Mining Company.—This company, at Morgan station, has ordered a complete electrical plant from the Jeffrey Manufacturing Company, Columbus, while the Erie City Iron Works will furnish the boilers.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Duchess.—The ore body in this claim, in the Dansby district, has increased in width.

Golden Coin.—Machinery has been ordered for a steam hoisting plant.

Lost Bonanza.—A carload of mica was shipped this week to Chicago. Most of it is for electrical purposes.

Lawrence County.

(From Our Special Correspondent.)

Baltimore & Deadwood.—The 20-stamp mill at Gayville is completed, and the tramway from the mill to the mine is being erected. The plant will start in about 10 days.

British-American Mining Company.—This company recently bought 50 acres of land northeast of the Gilt Edge. J. M. Sweeney, of Detroit, Mich., organized the company.

Deadwood & Delaware.—The water is being gotten under control at the Delaware shaft in Ruby basin. The Prescott is now throwing but 450 gals. per minute. Sinking will soon be resumed.

Detroit & Deadwood.—The east fork of Two Bit is nearly down to quartzite in mineralized shale. The company will begin work on the Barrett copper claims in Deadwood within two weeks.

Gilt Edge.—Regular shipments of 60 tons daily are made to the chlorination plant at Rapid City.

Norwich.—A strike of gold ore has been made in this claim, in Strawberry Gulch District. It is owned by J. King and leased to Morrow, Shaw and associates, of Galena and Deadwood. A shaft sunk 20 ft. in an old tunnel struck pockets of free gold. A ledge of milling ore about 9 ft. wide has been opened. The claim is east of the Gilt Edge and Dakota Maid, not far from Galena.

Pennington County.

(From Our Special Correspondent.)

Big Hit Mining Company.—This company's concentrating plant, on Battle Creek, a mile from Keystone, is practically completed, and the first ore will be run through next week.

Bullion.—W. E. Hymer and associates have taken a lease and bond on the Bullion Mine, north of the Keystone property, which has been shut down several years. The new company has also taken a bond and lease on the Ingram custom stamp mill, in Keystone.

Consolidated Holy Terror & Keystone Mining Company.—Thirty stamps are dropping on ore from the Holy Terror and Keystone mines. The old 10-stamp mill has been repaired. The Holy Terror shaft is to be sunk 200 ft. deeper from the 600-ft. level. New Wilfley concentrators have been put in the Keystone mill.

TENNESSEE.

Polk County.

Pittsburg & Tennessee Copper Company.—This company's copper mine at Ducktown has been bought by a New York company.

UTAH.

(From Our Special Correspondent.)

Bullion and Ore Shipments.—During the week ending February 18th, the bullion and smelter products forwarded East from the different smelteries and camps of the State were: 34 cars, or 801,962 lbs. lead-silver bullion; 2 cars, or 83,064 lbs. copper bullion; 50 cars, or 2,387,300 lbs. lead-silver ore.

Juab County.

(From Our Special Correspondent.)

Tintic Shipments.—For the week ending February 18th the consignments of ore, bullion and smelter products forwarded from the 3 shipping points of the district were 25 bars of bullion; 121 cars of ore, and 10 cars of concentrates. The Eureka Hill sent out 23 bars of bullion, and Mammoth 2 bars. The ore was shipped from the following properties: Centennial-Eureka, 20 cars; Grand Central, 17 cars; Swansea, 21 cars; Bullion Beck, 10 cars; Humbug & Uncle Sam, 6 cars; Mammoth, 5 cars; Godiva, 5 cars; South Swansea, 4 cars; Gemini, 3 cars; Ajax, 4 cars; Four Aces, Star Consolidated and Sunbeam, each 2 cars; Joe Bowers, Sioux and Utah, each 1 car; Dragon Iron, 17 cars hematite for flux. The Eureka Hill and Mammoth each shipped 5 cars of concentrates.

Summit County.

(From Our Special Correspondent.)

Park City Shipments.—In the week ending February 18th the ore and concentrate products sent forward through the Mackintosh sampler made a total of 2,080,205 lbs. The shipments were contributed as follows: Silver King, crude, 1,425,705 lbs.; Anchor, concentrates, 408,050 lbs.; Ontario, crude, 204,230 lbs.; Daly lease, crude, 42,220 lbs.

WASHINGTON.

Stevens County.

(From Our Special Correspondent.)

Agnes.—This claim lies between the Mud Lake and Little Giant. A shaft is going down on the vein.

Ben Hur.—The south drift shows quartz 6 to 8 ft. wide, the values running from $10 to $12 per ton. The projected tunnel to be run jointly by the North San Poil and Ben Hur has been abandoned, as right of way cannot be secured.

Bodie.—The shaft is down 112 ft. and sinking is suspended, awaiting a steam hoist, which it is hoped will be in operation by March 1st. Good values are maintained with depth.

Butte & Boston.—The crosscut tunnel intersected the vein 268 ft. in, at 209 ft. below the surface. The vein shows an average of 2 ft. of ore on the footwall side and a well-defined hanging wall. It is quite possible that the footwall has not been reached. The values reported are from $8 to $20 per ton.

Dude Fraction.—A tunnel, in 130 ft., has about 70 ft. more to run to tap the vein. This property is north of the Princess Maud and on the same vein as that and the Butte & Boston. The owners are interested in the Republic, Jim Blaine and Princess Maud companies.

Flag Hill.—A surface crosscut shows a vein 17 ft. wide, with average assay values of $4.15 per ton. A shaft from the crosscut is down 12 ft.

Golden Harvest.—At 350 ft. in on the tunnel on the vein a winze is down 32 ft. showing pay ore 7 ft. wide, assaying about $20 per ton.

Golden Sunset.—This is regarded as a northerly extension of the Golden Harvest. Open

cuts have disclosed the vein in 2 places. A company has been incorporated and sinking on the vein will start immediately.

Insurgent.—The vein has been stripped in two places and a shaft is going down under the footwall. This prospect is situated among the most valuable properties in the camp.

Insurgent.—This is claimed as an eastern extension of the Lone Pine vein, and the croppings have been stripped, exposing a vein from 16 to 20 ft. wide, with assays running from $2.20 to $12.79 per ton. The company will sink immediately.

Kate Hayward.—This claim is about 1,800 ft. west of the Republic, with a ledge cropping out nearly its full length from 8 to 12 ft. wide. Ore from 3 open cuts 200 ft. apart has given assay values up to $6.40, with an average of $3.50 per ton. A shaft 40 ft. down shows assays of $21 to $24 per ton. The footwall is of soft blue porphyry.

Klondike & Josephine Group.—This includes 5 claims on a ledge traceable over 4 miles that in one place is 50 ft. wide. Assays from a 22-ft. shaft on the footwall side give an average of $7.62 in gold per ton. The shaft will be carried down 100 ft. and the ledge crosscut. A vertical shaft on the Josephine is to go through the ledge. A cross ledge on the War Eagle, south of the Klondyke, gives ore that averages $4.85 per ton. The property is 3 miles east of Republic, on O'Brien Creek, southeast of San Poil Lake.

Lone Pine.—The east drift is in 139 ft. and making 1½ ft. per day. The ore has run up to over $60 per ton, with the pay shoot from 7 to 9 ft. wide. The most recent assays have not been reported. A shaft is down 25 ft. on the north end of the claim.

Monroe.—This tunnel has been through hard ground and is in 87 ft., with indications of a vein near. The tunnel will cut a vein of fine looking quartz 180 ft. in, and another at 330ft., both carrying good values. These veins are longitudinal veins. Another, at about 300 ft. from the north end line, should run diagonally across the Monroe and Raindeer. The quartz is very hard and assays up to $6 per ton. An incline 8 or 10 ft. deep shows a smooth footwall and 5 ft. of quartz, with no hanging wall in sight.

Morning Glory.—The tunnel is in 110 ft. Many rumors are afloat in regard to the property, but no definite information can be obtained.

North San Poil Fraction.—A shaft is down 18 ft., showing a vein 16 ft. wide, 5ft. of which will average $10 per ton.

Quilp.—A fine body of ore has been struck in a new north drift at 21 ft. in on the tunnel level. It is the best looking find in the mine.

Reindeer.—The tunnel is in 90 ft., showing ledge matter at the breast. The lead for which the tunnel was started should be cut at a depth of 150 ft.. over 100 ft. further on.

Rozanna.—A 4 or 5 ft. quartz vein has been opened on this claim, assaying up to $17 per ton. A tunnel in 110 ft. should strike the ledge about 100 ft. further in.

San Poil.—The winze from No. 1 tunnel is down 27 ft., and the raise from the No. 2 tunnel is up 60 ft. The distance between the 2 levels is 166 ft. When connection is made the vein will be systematically stoped, both north and south. It has an average width of about 4 ft. The average value of the ore so far is stated to be over $20, the higher values running from $30 to $150 per ton.

FOREIGN MINING NEWS.

AFRICA.

Transvaal.

The gold production for the month of January is reported as below, in crude ounces:

	1898.	1899.
Witwatersrand. . .	313,826	410,145
Other districts	22,751	20,865
Total	336,577	431,010

The total shows an increase of 94,433 oz., or 28.1%, over last year; but it was 9,664 oz. less than in December, 1898. The total this year was equivalent to 353,428 fine oz., or $7,305,356.

ASIA.

India—Mysore.

Dispatches from Bombay, February 16th, state that a plague panic has occurred in the Southern Colar gold-fields of Mysore. About 2,500 coolies have bolted, and it is feared this may lead to a suspension of the work. There have been 60 cases of plague in Southern Colar, and 45 deaths from that disease have been reported.

AUSTRALASIA.

New South Wales.

Broken Hill Proprietary Company.—This company reports for the four weeks ending February 2d a total of 19,185 tons of ore smelted. The refinery report shows a production of 2,489 tons lead, 60 tons hard (antimonial) lead, 296,067 oz. silver, 269 oz. gold; matte containing 15 tons copper and 18,236 oz. silver. This makes a total of 314,303 oz. silver. The averages were 13.3% lead, 0.014 oz. gold and 16.33 oz. silver to the ton.

Queensland.

Mount Morgan Gold Mining Company.—This company reports for January a total of 15,607 tons ore treated by chlorination, the yield being 10,542 oz. gold, or 0.68 oz. a ton. The decrease in the average yield results from the larger quantity of low grade ore now being treated at the new works.

Western Australia.

Great Boulder Proprietary Company.—Dispatches from the manager state that the results obtained from the ore by the Konemann process have been unsatisfactory. A final trial run of 14 days has been ordered.

CANADA.

British Columbia.

British Columbia Copper Company.—At the annual meeting of the stockholders the following were elected as directors of the company: H. L. Horton, Paul Babcock, C. J. Laidlaw, F. L. Underwood and J. .F Tichenor.

British Columbia—Cariboo District.

Lightning Creek Gold Gravels and Drainage Company, Limited.—At the meeting at Ashcroft on Feb. 6th James Reid, C. H. Unverzagt and H. W. Moore were elected trustees. Senator Reid, succeeding Dr. Reynolds, was elected president; Charles H. Unverzagt, vice president; H. W. Moore, secretary and treasurer, and O. Harvey, auditor. The report of the work of constructing the drain tunnel on Lightning Creek shows some 1,600 ft. completed and that the work was being pushed with three shifts. In addition, a shaft is being sunk some distance ahead of and in line with the tunnel, which will drain the bench and assist in determining the depth of the old channel and its exact location. The report showed the company free from debt and in condition to complete the preliminary work of drainage and prospecting.

British Columbia—East Kootenay District.

British Columbia Copper Company, Limited.—The officers of this company inform us that the company was incorporated in March, 1898, under the laws of the State of West Virginia, and registered in April, 1898, under the Companies' Act, 1897, of British Columbia, as required for foreign corporations doing business in that Province. The capital stock is $1,000,000, in 200,000 shares of $5 each, which have been issued, and are non-assessable. The property owned is the Mother Lode, Offspring Fractional and Primrose mineral claims, situated in Deadwood Camp, near the town of Greenwood, B. C., about 7 miles north of the boundary line. The directors are Paul Babcock, C. E. Laidlaw, H. L. Horton, F. L. Underwood and J. F. Tichenor. The board will organize in a few days. Messrs. Laidlaw & Co., No. 14 Wall street, New York, are registrars of the stock, and Frederic Keffer, of Anaconda, B. C., is manager of the property and the company's agent and attorney in that Province.

The development work consists of numerous shafts and cuts along the ledge for over 1,000 ft., and a tunnel across the ledge at a depth of about 100 ft., which shows the vein to be 185 ft. wide. From this tunnel a winze was sunk 100 ft. in depth and a crosscut run from the foot of same about 70 ft. to the hanging wall and 12 ft. toward the footwall, which shows over 60 ft. of pay ore. This work was all done for prospecting purposes and was stopped by water. It proved to the satisfaction of the managers, however, that they had a large mine, and they immediately installed a working plant, consisting of engines, boilers, hoist, 10-drill air compressors and electric machinery suitable for sinking to a depth of 1,000 ft. At a point 550 ft. distant from these workings they are now sinking a new working shaft 8 by 12 ft., which has reached a depth of 220 ft., the last 70 ft. being in pay ore, averaging from 5 to 6 per cent. copper and $6 to $8 in gold. At 200 ft. they are cutting out a station, preparatory to crosscutting. A drift run at this depth on the vein will be 170 ft. deeper than the old workings above described when it reaches a point under them. The company had in the treasury January 31st $20,000 cash, after allowing for all unpaid accounts, and in addition a large amount of treasury stock for sale to meet the future development of the property and its equipment with a reduction and smelting plant. The Canadian Pacific Railway has surveyed its Crows' Nest Pass line to within 200 ft. of the property, and the vice-president of that company states that the road will be completed to Greenwood, about 3 miles from the mine, within 90 days.

British Columbia—West Kootenay District.

Rossland Ore Shipments.—For the week ending February 16th there was shipped from Rossland mines 524 tons of ore. The shipments to that date for the year amount to 5,524 tons.

Buckhorn and Tintic.—These claims in Deadwood Camp are reported bonded to O. G. Laberee of Spokane and his Eastern associates. The claims are said to show a wide ledge of copper-gold ore.

Dundee.—The new mill at this Ymir mine has a Blake crusher, a coarse screen, two Cornish rolls, three trommels, a sizer, three single-compartment Hartz jigs, two Wilfley concentrating tables and a double-deck buddle. The plant is driven by steam, with the exception of the concentrating tables, which are driven by a three-foot Pelton wheel, which also drives the electric light dynamo. The concentrator is of 50-ton capacity. The machinery was furnished by the E. P. Allis Company, of Milwaukee, Wis. The mill was erected under the supervision of Charles Parker and J. L. Parker, consulting engineer of the Dundee and Tamarack mines.

Ymir.—This mine at Ymir is developed by three tunnels, the lowest being in about 800 ft. The mine is connected with the new 40-stamp mill by an aerial tramway 2,160 ft. long. There are four batteries, each containing 10 stamps, weighing about 950 lbs. apiece. There are three 6-ft. vanners to each battery, 12 in all. On the lowest floor is a 60 horse power boiler, which serves to heat the mill and also the coils, in two tanks, that supply the battery, so that in cold weather warm water can be obtained. All the machinery is driven by a six-foot Pelton wheel under 420 ft. head. The Ymir is worked by the London & British Columbia Gold Fields, Limited.

(From Our Special Correspondent.)

British America Corporation.—At the Great Western, development work continues. No ore indications are reported by the management. At the Nickel Plate the recent discovery of an ore shoot in the east drift of this mine is confirmed.

Evening Star.—There are no new developments respecting the strike recently reported.

Le Roi.—This mine has temporarily suspended shipments. The various workings are being inspected and put in better shape. This policy was decided upon by the management some time ago.

Mining Legislation.—The Government, it is said, has agreed to make certain amendments in the legislation recently enacted. The modifications proposed will practically suspend the operation of some of the clauses, and make other portions a dead letter.

White Bear.—Operations have been temporarily suspended.

Northwest Territory.

Recent press despatches state that the great crowd of prospectors who tried to get to the Klondike by an overland route from Edmonton, generally came to disaster. Parties lost their way completely, or made very slow progress through the vast muskeg and cedar swamps, and considerable settlements of stranded prospectors are reported at various points. The majority of those who went up the Peel River returned much discouraged. The same is true of those who went up the Laird River. The rich strikes reported on the Buffalo, Laird, Nahanna, Gravel and Peel rivers were imaginary. The only metal of value found was copper ore on the Gravel River. A rumor that a silver ore strike had been made on Great Slave Lake kept a number of men there, but the find is reported false. "Gold Nuggets" that the Indians brought in occasionally proved to be ocpper ore.

Nova Scotia—Guysboro' County.

Cocran Hill.—A company of Boston, Mass., men, with J. B. Neily president, has had a 20-stamp mill erected. Four hoisting engines have been set up at 4 shafts, and air compressors will supply power drills.

Madstock.—This mine has been sold to a New Brunswick company, that is preparing to work it.

CUBA.

The Santiago Copper Company, Limited, has been incorporated under the laws of West Virginia, for the purpose of locating and operating mines in the United States and Cuba. The principal office is to be in New York, and the authorized capital is $1,000,000, of which $500 has been subscribed and $50 paid in. The incorporators are Joshua Brown and M. W. Geisinger, of Manhattan, and A. F. Hodges, M. Duncan and William H. McManus, of Brooklyn.

EUROPE.

Russia.

Oural Gold-fields of Western Siberia.—This company has been organized in London with a capital stock of $1,200,000, to work a group of 12 gold mines in the Kotchkar District of the Ourals. The principal mines are the Michaelovski and Ouspenski, both of which have been worked for some time and are extensively developed.

Russian Collieries and Railway Company.—This company, which has recently been floated in London, has a capital stock of $1,800,000. It will purchase and operate the Nicolaieffka collieries and coke works and the railroad leading to them. These collieries are in the Donetz coal-field, in the Government of Ekaterinoslav, and have heretofore been worked by Mr. Vladimir R. Maximoff.

COAL TRADE REVIEW.

New York. Feb. 24.

Anthracite.

The weather during the week has been mild enough to allow breakers to run without trouble, and permit railroads to get their lines well opened. As a result the supplies of coal at tidewater points have been ample. The ice-bound ships at New York are open and all fears of a coal famine are ended for this winter. The coal wave has certainly cleared the way for a good season's business by getting rid of a lot of old stocks at stocking grounds, and in yards and cellars. New coal must take its place, and in spite of warm days spring is not yet here, and a lot of coal will go into cellars during this month and March.

In the West, though the demand for anthracite dropped as the thermometer rose, stocks have been reduced and there is still a lot of coal changing hands. Business at Duluth has been brisk and the shortage of anthracite is more apparent. It is reported that less than 345,000 tons are on the docks at the head of the lakes.

At Chicago it is reported that stocks on dock do not exceed 200,000 tons. Nut size in that territory is now almost out of the market altogether. The movement of coal is much less than during the cold snap, but a considerable amount of coal will go into Chicago territory by rail as soon as the railroads get their lines and rolling stock into shape.

Considerable attention has been paid to the Delaware, Lackawanna & Western annual meeting, from speculations concerning the retirement of Mr. Samuel Sloan and the policy of his successor. It now looks as if little change is likely in the policy of the road. Mr. Truesdell, who, according to report, is to succeed Mr. Sloan, will probably find that he will have to make the road pay dividends, and as long as the Delaware, Lackawanna & Western is independent of other anthracite interests agreements will amount to as much in the future as in the past.

Prices in the East show no change from last week. Now that the pressing demand for immediate delivery is ended prices are likely to be easier, and though unchanged nominally, favored parties may get satisfactory terms. We quote for free burning anthracite, f. o. b. New York: Broken, $3.15; egg, $3.35; stove, $3.75.

Notes of the Week.

At the annual meeting of the stockholders of the Delaware, Lackawanna & Western Railroad on February 21st, Samuel Sloan was re-elected President, for the thirty-fifth time. It is stated he will become chairman of the Board of Managers in about a month's time, when W. H. Truesdale of the Rock Island will be chosen to the presidency of the company. F. F. Chambers was re-elected secretary, and Frederick H. Gibbens, treasurer. The new Board of Managers consists of John I. Blair, Eugene Higgins, William W. Astor, William Rockefeller, Henry A. C. Taylor, J. Rogers Maxwell, George F. Baker, James Stillman, Frank Work, Hamilton McK. Twombly, Harris C. Fahnestock, Frederick W. Vanderbilt, M. Taylor Pyne and John D. Rockefeller, Jr. The last named takes the place of Roswell G. Rolston, deceased.

Bituminous.

Warmer weather has cut down the heavy demand for soft coal for immediate delivery, has unlocked Chesapeake Bay ports and taken the edge off the coastwise vessel market. The seaboard soft coal trade consequently finds a demand that is yet very large confronted by inadequate transportation facilities. A number of contracts for the coming season have been closed during the week at prices no better than last year. It is said that many producers, anticipating a very good transient demand, are not in a hurry to take contracts when transient business is likely to pay better.

Trade in the far East is good. Supplies at some points in that territory got lower than ever known before, and liberal shipments for some time will be necessary. Along the Sound and at New York Harbor ports the consumptive demand is heavy and the movement of coal large.

Transportation from mines to tide is much better than it has been. Car supply is still insufficient. In the coastwise vessel markets the market is easier. A number of vessels are yet icebound in shallow harbors, and the supply of vessels is not large enough to take all the coal ordered to be sent forward. Rates are nominally $1.75 from Chesapeake Bay ports to Boston, Portland and Portsmouth, and $1.50 to Sound ports. As ice still hinders shipments from Philadelphia, a great deal of coal is being forwarded from New York.

Prices show little change, and we quote best coals, New York, $2.25; poorest, $1.60. George's Creek, New River and Pocahontas, $1.65 at Chesapeake Bay shipping port.

Birmingham, Ala. Feb. 20.

(From Our Special Correspondent.)

The output of coal in this district was hampered during last week by extremely cold weather, which prevailed for three days. The mines were idle for over half a week, and in Walker County there are some of the mines still unable to operate on account of the accumulation of a great amount of water. The retail dealers did not seem to have their yards filled, and when the cold weather struck the people broadside many orders could not be filled. The retail dealers advanced coal from 50 cents to $1 per ton. The wholesale dealers and miners were glad to get the coal out and receive the regular price. The railroads were alarmed at the prospects for fuel, and urged the miners to do all in their power to get the mines in operation again. The mining companies who furnished their own coal for furnaces banked the fires at the furnaces in order to furnish large consumers of coal. The coke ovens remained quiet for a few days, and there was such a scramble for coal as we never before experienced.

Efforts have been made by Alabama mining companies to get some large railroad contracts heretofore filled by Pennsylvania miners. Representatives of local railroads and of the coal companies also have been doing considerable figuring around New Orleans with the large railroads centering there, with the hope of getting good contracts for the present year. At present there is much coal being prepared for shipment to New Orleans via the Mississippi River barge line.

As far as can be learned, there will be no trouble with the miners when the new contracts are to be signed in July. The miners are anxious for steady work and that is what the companies will be able to give. It is expected that if the pig iron prices remain as encouraging as they are, the coal miners will get an advance in their prices.

Pittsburg. Feb. 23.

(From Our Special Correspondent.)

Coal.—The prospect of a dsastrous flood has been removed. The coal men had an exceedingly busy time, both night and day; a number of powerful towboats have been engaged breaking the ice in the pools and freeing the barges that were imbedded in ice 7 in. thick. Such weather as we had for ten days was never before experienced in this region. There is no telling how the towboats that left with tows tied up between Pittsburg and Cincinnati will fare; that will be learned later. We had a very narrow escape from a coal famine; prices advanced $1 a ton.

H. C. Frick's big coal purchase, involving $616,000, is officially denied; the papers won't accept Frick's denial, and still publish the story. At Greensburg, Pa., the annual report of C. B. Ross, inspector of the second bituminous mining district, shows that for 1899 the total production was 9,134,797 tons of coal, and 3,049,539 tons of coke, against 9,820,673 tons of coal and 3,049,537 tons of coke in 1898. The number of hands employed in 1898 was 12,501. There were 96 accidents, 30 of them fatal. The H. C. Frick Coke Company was the largest producer, reporting 1,500,882 tons coal and 908,185 tons coke.

The miners have been holding meetings all week and have resolved upon a 6c. decrease of the differential between thick and thin veins. Miners of the local region in their district convention on Saturday, resolved that the differential between thick and thin vein coal should be reduced from 13 to 7c. This action is looked upon as radical, and it was admitted by a number of the delegates that its enforcement would result in a strike, insomuch as the thick vein operators are a unit against any decrease in the differential.

At Glen Campbell, Pa., the miners' strike was ended on Tuesday by the different companies paying 45c. gross ton. Work was resumed at all the mines.

Connellsville Coke.—The coke trade suffered wonderfully from the cold wave. Demand for coke was above the ordinary, and production was large under the difficulties, but the shipments were terribly broken. The railroads, because of frozen machinery and snowbound tracks, were powerless to randle the coke, and as a result one-third of the product was thrown in the yards last week. When the money cost of the blizzard comes to be computed, the losses of the coke region will be found to foot up many thousand dollars.

The Duquesne Coal and Coke Company, in which Pittsburg is interested, has purchased the property and coal lands of the St. Clair Coal and Coke Company at Latrobe, Pa., for $200,000. The tract contains 150 acres of coking coal, and 100 beehive ovens. The capacity of the plant will be increased. Had the weather been favorable, from 200 to 300 ovens would have been fired.

The week's shipments amounted to 138,597 tons. Shipments to Pittsburg, 2,623 cars; sent West, 4,029 cars; sent East, 1,165 cars; total, 7,817 cars.

SLATE TRADE REVIEW.

New York. Feb. 24.

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.	Unfad'g Green.	Red.
	$	$	$	$	$	$	$	$	$
28 x 14	.....	....	.....	.....	.....	.....	2 50	....	.....
26 x 14	.....	...	.....	.....	.....	.....	2 50	....	.....
24 x 16	.....	....	.....	.....	.....	4.75	.....	.....	.....
24 x 15	.....	....	.....	.....	.....	4.75	.....	.....	.....
24 x 14	6.10	3.35	2.90	3.10	3.50	4.85	2.50	3.50	.....
24 x 13	.....	.....	.....	.....	.....	4.85	.....	.....	.....
24 x 12	6.60	3.35	2.90	3.10	3.50	5.00	2.50	3.50	.....
24 x 10	.....	.....	...	...	.....	5.00	.....	.....	.....
22 x 14	6.10	.....	.....	.....	.....	5.00	2.40	3.50	.....
22 x 13	.....	.....	.....	.....	.....	5.00	.....	.....	.....
22 x 12	6 60	3.50	2.90	3.10	3.50	5.00	2.50	3.50	...
22 x 11	6.50	3.50	3.00	3.10	3.75	5.00	2.75	3.75	.....
20 x 14	6.40	...	.....	.....	.....	...	2.40	3.50	.....
20 x 13	...	.....	.....	.....	.....	5.00	.....	.....	.....
20 x 12	6 90	3.50	3.00	3 10	3.75	5.00	2.50	3.75	.....
20 x 11	6.80	.....	.....	3.35	.....	5.00	2.50	3.75	.....
20 x 10	6 80	4.00	3.25	3.35	3.80	5.10	2.75	4 00	10.50
18 x 18	...	4.00	.....	.....	.....	.....	.....	.....	.....
18 x 14	6.50	.....	.....	.....	.....	.....	.....	.....	.....
18 x 12	6.80	3.50	.....	3.10	.....	5.00	2.50	3.50	.....
18 x 11	7.00	.....	.....	.....	.....	5.00	2.50	3.75	.....
18 x 10	7.20	4.00	3.25	3.35	3.80	5.10	2.50	4.00	10.50
18 x 9	7.10	4.00	3.25	3.35	3.80	5.10	2.50	4.00	10.50
16 x 16	7.00	4.00	.....	.....	.....	.....	.....	.....	.....
16 x 14	.....	4.25	.....	.....	.....	.....	.....	.....	.....
16 x 12	6.80	3.50	.....	3.10	.....	.....	2.40	3.50	.....
16 x 11	6.90	.....	.....	.....	.....	5 00	.....	.....	.....
16 x 10	7.10	3 75	3.25	3.35	3.80	5.00	2.40	4.00	10.50
16 x 9	7.05	4 00	.....	3.35	3.80	5.10	2.40	4.00	10.50
16 x 8	7 20	4.00	3.15	3.35	3.80	5.10	2.40	4 00	10.50
14 x 14	7.00	4.00	.....	.....	.....	.....	.....	.....	.....
14 x 12	6.50	.....	.....	.....	.....	.....	2.25	.....	.....
14 x 10	6 60	3.50	3.15	3.10	3 75	5 00	2.25	3 75	10.50
14 x 9	6.50	.....	.....	.....	3.40	4.85	2.25	3.75	10.50
14 x 8	6 60	3 50	3.15	3.10	3.40	4.85	2.25	4.00	10.50
14 x 7	6.40	3.50	3.15	3 10	3.40	4.85	2.20	4.00	10.50
12 x 10	5.80	4.50	...	....	.....	4.60	2.20	3.25	.....
12 x 9	5.60	.....	.....	.....	.....	4.60	2.20	3 25	.....
12 x 8	5.50	3.25	.....	3.10	3.25	4 60	2.20	3.25	9 00
12 x 7	5.00	3.25	.....	3.10	3.25	4.60	2.20	3 25	9.00
12 x 6	4.80	3 25	....	3 10	3.25	4.60	.....	3 25	8.50
11 x 10	...	3.50	.....	.....	.....	.....	.....	.....	.....
11 x 8	4 50	.....	.....	.....	.....	.....	.....	.....	.....
11 x 7	4.00	....	.....	.....	.....	.....	.....	.....	.....
10 x 12	....	...	.....	.....	.....	.....	.....	.....	.....
10 x 11	...	...	.....	.....	.....	.....	.....	.....	.....
10 x 8	4.00	.....	.....	.....	.....	.....	.....	.....	6.50
10 x 7	..	.....	..	.....	.....	.....	.....	.....	6.50
10 x 6	.....	.....	.....	.....	.....	.....	.....	.....	6.50
9 x 7	3.50	.....	.....	.....	.....	.....	.....	.....	.....

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

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 seagreen, $2@$2.25 per square. Intermediate red, 14x7 and larger, $6; 12x6, 12x7 and 12x8 in., $5 per square, net.

Demand is unchanged, while new price lists are shortly to be issued by some concerns.

Export trade shows several large shipments of roofing slate to the British market. Freight rates are unchanged. Billiard beds are finding a good market abroad, and quotations range from 18@23c. per superficial foot, according to quantity. Large buyers can doubtless shade these figures. The exports from Baltimore were 89 tons roofing slate, valued at $1,080 to Dublin, and 5,643 pieces, valued at $2,740, to Belfast.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements, see also page 256.)

New York. Feb. 24.

Heavy Chemicals.—In several cases higher prices are being asked. Foreign goods are momentarily limited in supply, owing to light and irregular arrivals. In domestic chemicals a good undertone characterizes the demand, and makers of caustic soda are not anxious to take further orders of future deliveries at present prices. The imports at New York this week include 317 casks and 58 bbls. bleaching powder and 400 cases German cyanide of potassium. The receipts of domestic goods included 335 sacks soda ash, and 86 bbls. potash.

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, 60@65c. f. o. b. works; 70@75c. delivered; foreign 75@80c. Bleaching powder, English prime brands, $1.60@$1.70 per 100 lbs.; other brands, $1.50@$1.60. Continental F, prime, $1.55@$1.60. Bicarb. soda, domestic, ordinary, $1.12½@$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.—A slightly better demand is noticeable and prices are unchanged. The General Chemical Company—the new acid agreement—is rapidly getting into shape for business.

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.—Arrivals this week aggregate 3,907 tons, and these have rather eased the market. Best unmixed seconds, on spot, are quoted $23@$23.50, and thirds $2 less. Futures "seconds" are quoted $21@$21.50 per ton, and thirds $19.50@$20.

Imports of brimstone into Great Britain in January were 1,807 long tons, against 606 tons last year. Imports of iron and copper pyrites valued chiefly for their sulphur contents were 59,893 long tons, against 61,646 tons in 1898.

Pyrites.—Demand continues on regular lines, at unchanged prices.

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.

Nitrate of Soda.—Agriculturists have been buying in a better way, and sales are reported at $1.62½@$1.65 on spot, while futures have been offered at $1.52½@$1.55 per 100 lbs. We note a charter of a British bark of 2,489 tons from the West Coast of South America to New York, at 24s. 6d. ($5.88) per long ton.

Fertilizing Chemicals.—This market continues to show an improved demand, and quotations are being made on spring deliveries. Prices are practically unchanged. Imports included 1,000 bags muriate of potash, and 501 bags sulphate of ammonia.

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), 57½c. per unit. Acid phosphates, 13@15% av. P_2O_5, 60@65c. per unit at sellers' works in bulk. Dissolved bone black, 17@18%, P_2O_5, $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.—Demand is good and prices well maintained. Of the charters taken we note a British steamer from Charlotte Harbor to Harburg, at 18s. ($4.32), free lighterage, sailing March 10th-April 10th.

Quotations are: Florida high grade, 75@80% rock, $9@$9.25 per long ton f. o. b. Fernandina. The freight rate of 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.

Charleston, S. C.—Our special correspondent writes that the shipments of phosphate rock from this port in January, amounted to 11,403 long tons of crude, against 8,763 tons in 1898, and 6,775 tons in 1897.

Liverpool. Feb. 9.

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

While chemical manufacturers are kept busy with deliveries on contracts, there is not much fresh business reported.

The following are particulars of the Board of Trade export returns for the month of January:

	Alkali. Cwts.	Bleaching Powder Cwts.
Total exports to all quarters.....	287,959	102,755
To United States alone.....	35,077	67,589

As compared with January, 1898, shipments of alkali to the United States show a marked decrease, also to Germany, while shipments to Holland and Italy have largely increased, and exports to France, Spain and Australasia also mark an improvement. With respect to bleaching powder, shipments to all quarters, including the United States, are heavier than for corresponding month of last year.

Soda ash is in light demand for export, while quotations vary considerably, according to destination. We quote maximum spot range for tierces about as follows: Leblanc ash, 48%, £4 5s.@£4 10s. per ton; 58%, £4 10s.@£4 15s. per ton, net cash. Ammonia ash, 48%, £4@£4 5s. per ton; 58%, £4 5s.@£4 7s. 6d. per ton net cash. Bags 5s. per ton under price for tierces.

Soda crystals are in request, at £2 17s. 6d. per ton, less 5% for barrels, with special terms for certain favored markets. Bags 7s. per ton under price for barrels.

Caustic soda is being freely shipped on contracts, and prices are well maintained. We quote spot range, as follows: 60%, £5 17s. 6d.@£6 per ton; 70%, £6 17s. 6d.@£7 per ton; 74%, £7 7s. 6d.@£7 10s. per ton; 76%, £7 15s.@£7 17s. 6d. per ton, net cash.

Bleaching powder is in moderate supply at the moment, shipments being fairly heavy, although at the same time there are not many sales reported on the market, manufacturers apparently doing the bulk of the trade direct. For unbarred makes of hardwood, prices range from £5@£5 2s. 6d. per ton.

Chlorate of potash is nominally quoted at 3½@3⅝d. per lb. for crystals and powdered, respectively, but not much going on.

Bicarb. soda varies considerably in price, according to market, ranging from £5 5s.@£6 15s. per ton, less 2½%, for the finest quality in one cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia has been rather dull, with an easier tendency, but with an improved inquiry at the close, the position is firmer, and £10 7s. 6d.@£10 10s. per ton, less 2½%, represents nearest spot value for good gray 24@25%, in double bags, f. o. b. here.

Nitrate of soda is meeting with rather more inquriy, 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. 24, 1899.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending Feb. 25, 1898 F'ces	Tons	Week ending Feb. 24, 1899. F'ces	Tons.	From Jan.,'98 Tons	From Jan.,'99. Tons
An' racite	26	17,250	32	26,450	144,973	194,314
Coke.....	144	206,750	146	207,250	1,637,173	1,665,811
Charcoal.	15	5,150	17	5,150	42,198	44,758
Totals..	185	229,150	195	238,850	1,824,344	1,904,883

The marked feature in the iron and steel trade at present is the upward movement of prices. In many lines this applies only to comparatively small business, as supplies have been already arranged for up to June at least, and the higher prices are asked and paid only on special requirements, or on business which came in later. There is plenty of steel and iron to be delivered yet on low-priced contracts. People are beginning to think of the second half of the year, however, and the question is whether the advances made can be fully maintained on such sales. Sellers are inclined to think that they can, and something like a deadlock may intervene.

It must be admitted that there is a rush to buy which is larger than had been expected, and which is due to two causes. One is the entrance into the market of a considerable speculative element, which is now making itself felt. The other is a rush on the part of some people who want to get their supplies as far ahead as possible before production falls entirely into the hands of trusts and combines. There is no question that the talk of combinations has been a very unsettling influence, and has done more than anything else to cause a sharp and unequal rise. At present many are in doubt, and dread the influence of the combinations. It is to be remembered that in a short time many of these new trust stocks will be on the exchanges, and there will be a strong temptation to manage business with one eye on the stock market. It may be said that this is only natural, but it is not a good way.

The sales in certain lines have been large. Both Bessemer and foundry irons have been in demand, and there is a good deal of basic pig called for. Some of it is wanted right away, but can hardly be had. In steel billets there has been quite a flurry, which has not yet subsided. For finished, and especially structural material, there is a continued pressure of orders.

Export trade continues active, though the advance in prices will tend to check the outward movement to some extent. This is especially the case in steel rails, where the competition is perhaps sharpest between our own and European mills. In pig iron the Southern furnaces continue to get a good many orders for foreign shipment, and there will be a large business done through Southern ports for some months to come.

The drop in production shown by the February returns of the furnaces will be only temporary. It was due to the necessity of blowing out several furnaces for repairs; but others are coming in to take their places. It has given a chance to renew the cry of a pig iron famine, but without very much effect. Several big new furnaces will be coming into blast in a few months, and all the iron wanted will be forthcoming.

Combinations continue to furnish plenty of reports. The bridge-builders' combine, which is to take in all the leading bridge firms and some structural people also, is to be financed by J. P. Morgan & Co. The same firm has also in hand the combination of steel pipe makers. This does not seem to be in a very advanced stage, however. Other combinations are talked of, but less definitely.

Birmingham, Ala. Feb. 20.

(From Our Special Correspondent.)

The production of pig iron in this district was greatly reduced by several of the furnaces having their fires banked during the past week, on account of the scarcity of coke and coal. There was unprecedented weather for three or four days, and the demand for fuel was so great and the mines could not keep in operation. The furnaces, and there were five or six of them, were out of blast for three or four days. The shipments did not ease up any and the stocks on hand did not warrant any suspension of the production. The consequences are that should the demand remain as active as it has been, and deliveries are demanded at once, there will be more orders refused.

The market seems to be in a steady condition. There has been an advance asked for and from all indications the purchasers will be forced to give it. The export trade is in excellent condition, and furnacemen say that they are finding it easier to get advanced prices from the foreign buyers than from the domestic purchasers.

The furnaces are just now resuming their regular work. The fuel problem, as the weather becomes more like spring, is becoming easier to solve, and there is no anticipation of another shortage in coke or coal.

There are no big orders being received just now, though many inquiries are said to be coming in. The advanced prices asked for iron are not keeping many of the smaller buyers away, though the big purchasers are not so willing to buy at present.

The finished iron market is in excellent condition yet, with very bright prospects for the future also. The rolling mills are still doing all the work they can, and the product is being shipped out as quickly as cars can be secured. No advance in price was reported in this section lately, notwithstanding the rumor in the North.

The brass foundries report that they are unable to do much on account of the high price being asked for copper and brass, especially scrap. There is plenty of work ahead, but a profit is impossible at the prices now asked for stock.

At the pipe works at Bessemer, there seems to be much going on. Considerable pig iron is being used and quite an amount of pipe is being made. Nothing new has developed hereabouts since the big pipe trust was formed in the East; the Addyston Pipe and Foundry Company has not made any further move toward building its plant in the neighborhood of Bessemer, and the deal seems to be off ever since the announcement was made that the Addyston Company would be in the big combine.

At the big steel plant and the steel rod and wire mill at Ensley City, the bad weather kept down work for more than a fortnight and lost time is now being made up.

The following are the quotations given for pig iron in this district: No. 1 foundry, $8@$8.50; No.

2 foundry, $7.75@$8.25; No. 3 foundry, $7.75; gray forge, $6.50@$6.75; No. 1 soft, $8@$8.50; No. 2 soft, $8.

Buffalo, N. Y. Feb. 22.

(Special Report of Rogers, Brown & Co.)

A much larger demand exists than there is material to supply. The result is much disappointment on the part of buyers, who are unable to obtain their favorite brands. A secondary result is the cleaning up of odds and ends of pig iron wherever they can be found. Small lots here and there, which have been neglected for months, now find a ready sale. The most popular brands of foundry iron have been taken up for several months to come, and some have been sold heavily through to December. These furnaces as a rule have confined their sales to their regular customers, the increase appearing to come from the increased consumption of the latter's shops. The scarcity of Lake Superior ores limits the increase of production in the North, and coke supply affects the South in the same manner, giving promise of a continuance of existing conditions through the present year. The quotations given below are on the cash basis 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, $12.25@$12.75.

Cleveland, O. Feb. 22.

(From Our Special Correspondent.)

Iron Ore.—The sales made during the past week embrace the disposition of some lots of ore already on the docks of Lake Erie, as well as some additional lots of ore to be brought down during the season. The volume of the transactions, it is said, will not vary much from that of the preceding week. Very little was done during the past 10 days toward chartering vessels to bring down ores already sold. The movement of ores toward furnaces is quite active. Especially is this condition true of the Cleveland docks. The present indications are that the docks will be unusually clear by the time navigation opens for the season. Ores which have been on the Cleveland docks for several years were moved forward to furnaces during the past week. Following are the prices for ores: Specular and magnetic, 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.—As there is a good demand for nearly every variety of pig iron produced at the present time, the market continues strong. The tendency of the prices is upward, and the outlook for a continuance of the present strong conditions is favorable. Following are the 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. 24.

(From Our Special Correspondent.)

Pig Iron.—It is simply impracticable to state the truth in regard to the iron market to-day, because there is such an admixture of scares, panic and rumor. Everything is unsettled. Extravagant statements are heard on all sides. Quotations are made which appear incredible. There has been since Monday quite an influx of people who want to buy iron, but between extravagant prices and scarcity and desire to avoid selling, there is only a moderate volume of business transacted. It turns out that the general run of foundry iron buyers had very little iron on hand or under contract. There are several large users of forge iron who would like to cover, but their efforts this week were failures. No. 1 X foundry is $13@$13.50; No. 2 X foundry, $12@$12.50; forge, $11@$11.50. There are parties after basic and Bessemer who may succeed in getting material, but high prices must be paid.

Billets.—Billets have been quoted at $23, but lower and even higher quotations have been given. Comparatively few lots have been sold, and those, small. Careful inquiry shows that a great deal of billet stock is needed, but at present writing buyers are paralyzed and do not know what to do. They hesitate to quote prices on new work.

Merchant Bars.—The bar iron markets are all strong. Store demand is large all through Eastern Pennsylvania. Every little shop is buying. Common iron is cheap at 1.15c.; refined goes at 1.25c.; test at 1.30c., and special steel at 1.40c.

Sheet.—The oversold condition of the sheet mills is more pronounced, and to-day offers were made which even if not accepted, cannot but help have an influence on prices, especially on light sheet. A great deal of corrugated and roofing material is under inquiry.

Merchant Steel.—The consumption of merchant steel is steadily increasing throughout the New England States and Atlantic Coast towns. The advance made on large orders has been maintained.

Pipes and Tubes.—The market continues to be exceptionally strong, and more business is offered than can be considered.

Skelp.—Skelp has moved up a tenth.

Nails.—While the consumptive demand is limited, jobbers report an unusual demand for this season of the year. Cut nails have advanced in sympathy with wire. Makers have been conferring, and they may have something to say soon.

Plates.—Office men have managed to make room for a few thousand tons of material, with the understanding that they have their own time. Shipyard demand has not been met, but shipbuilders are confident they will have first chance. All kinds of plates have moved up since Monday, but quotations might as well be omitted until matters settle.

Structural Material.—The demand for small lots of shops has largely increased since the weather cleared. Much of the new material is for projected office building and bridge work. The bridge combination causes talk, and engineers say the next thing to look for will be an advance. The news on every hand is that an advance of from two to three-tenths is probable as soon as the leading makers settle some preliminaries.

Steel Rails.—The quotation of $22 is as good as any. Rumor has it that another advance in the West will soon be announced, and that they will be followed by another mark up here.

Old Rails.—Some old iron rails have sold as high as $14, and the buyers were glad to get them.

Scrap.—There is a general call for scrap, and high prices have been paid this week for all that could be delivered. The scrap pool is certainly bringing up the rear. There is not enough scrap to be had in this market.

Pittsburg. Feb. 23.

(From Our Special Correspondent.)

So much attention has been paid to the iron and steel interests that the story has become somewhat threadbare. At this time there are few new developments, but it is satisfactory to be able to confirm all the good things that have been said during the past several weeks. The prices of iron and steel continue to advance all along the line. Notwithstanding the most disagreeable weather we experienced during the previous week, there was no let up in the demand, and prices continued on the upward grade. The furnaces that depended on natural gas for fuel were obliged to close down and wait for milder weather; this, however, has been remedied by the change of weather and work was resumed on Monday, much to the satisfaction of owners and workmen.

The stoppage of several furnaces for repairs at a time when the demand is most pressing has caused some fear of a famine, although quite a number of other furnaces have started up since the first of the month, or are about to start, which will increase the supply. The largest consumption ever recorded in any month, is in part due to the hasty purchases of products about to be controlled or advanced in price by a combination. There are so many of these in the iron and steel industry that the present market does not clearly indicate the magnitude of demand, and disappointment in some branches is not improbable.

Finished Material.—The demand keeps up with the highest limits, with no prospects of abatement in buyers' requirements in the near future, but the reverse. Prices on plates have further advanced and in all departments the tendency is toward higher prices, as the mills are crowded with work in all their departments. Some of the larger plants have sufficient orders booked to last until July.

Old Material.—There is a good demand and sales are easily made at quoted rates, in most cases at the outside prices. The offerings continue light.

Muck Bar.—Prices took an upward move, with sales $21.75.

Wire Nails.—Market firm, with a good demand at $1.65@$1.70.

Wrought Iron and Steel Pipe.—The demand is unusually active for the season; prices continue to advance; an order for 150 miles was placed last week for Indiana at the advanced rates.

Sheet Bars.—No sales reported; prices are away up, but correct quotations are not obtainable.

Latest.—The market is in that unsettled and sensational condition that the figures of one day are but little criterion for to-morrow. The advance on iron and steel has been large. Last week billets sold at $18@$18.50; this week at $20.35@$20.50, with one sale made last Saturday of 7,000 tons at $20. Bessemer at Pittsburg last week was $11.65; this week, $12.65. Valley Bessemer held at $12. Mill iron at Pittsburg sold at $12.

Muck bar moved up to $21.75. Quotations for sheet bars and wire rods are not obtainable. The only thing talked of at present is consolidation.

The Valley furnaces are credited with selling 40,000 tons Bessemer for $12 at furnace. No information is obtainable from the Carnegie Company.

COKE SMELTED LAKE AND NATIVE ORE.

Tons.	Cash.
4,000 B., M., A., V.	$12.00
3,000 B., A., M., P.	12.65
2,500 Mill I'n, M., A., P.	12.00
2,500 B., A., M., P.	12.65
2,000 M. I'n, a. o., M., P.	11.70
2 000 Mill I'n, F., P.	11.80
2,000 M. I'n, pro'pt, V.	10.75
2,000 B., F., M., P.	12.65
2,000 B., M., P.	12.50
1,500 Mill Iron, A., P.	11.75
1,500 B., M., J., P.	12.65
1,200 Mill Iron, F., P.	12.00
1,000 M. I'n, M., A., P.	11.85
1,000 Mill Iron, F., P.	11.65
1,000 B., M., P.	12.65
1,000 B., A., P.	11.90
1,000 B., M., P.	12.65
500 B., F., P.	12.70
500 M. I'n, pro'pt, V.	12.00
500 M. Iron, spot, P.	11.80
400 M. I'n pro'pt, P.	11.75
300 No. 2 F'dry, P.	11.60
300 No. 2 F'dry, P.	11.50
200 No. 2 F'dry, P.	11.60

BLOOMS, BILLETS, SLABS.

750 Blts., M., A., P.	$20.35
600 Billets, M., P.	20.40
500 Billets, A., P.	20.50
500 Billets, extra, P.	20.00
500 Billets, M., P.	20.50
100 Slabs, F., P.	20.50

MUCK BAR.

Tons.	Cash.
1,000 Neutral, P.	$20.50
150 Neutral, P.	19.50

FERRO-MANGANESE.

50 80% Domestic, P. $32.50

CHARCOAL.

1,000 Warm Blast, P.	$16 00
300 Warm Blast, P.	16.00
287 W. Blast, ex., P.	16.75
100 C. Blast, ex., P.	23.25
100 Lake Superior, P.	14.25
75 No. 3 F'dy., P.	16.00
50 Cold Blast, P.	20.00

OLD RAILS AND SCRAP.

1,000 Steel Rails, gr., P.	$10.75
500 Steel Rails, gr., P.	10.50
500 Wr't Sc'p, gr., P.	12.50
500 Cast Scr'p, gr., P.	10.00
500 H'vy M. S. gr., P.	10.00
300 Wr. T'ngs, gr., P.	6.50
300 Iron Rails, gr., P.	14.50
300 No. 1 W. S., net, V.	12.50
200 Cast B'gs, net, V.	6.00
100 O. I. Axles, net, P.	17.00

Cartagena, Spain. Feb. 4.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—The shipments for January were 29 cargoes, 15 of these were dry ore, 11 of manganiferous, and 3 of Cehigin magnetic. The cargoes shipped during January with the vessels now in port make a considerable reduction in the stocks of ore on wharf, and owing to the defective railway service boats are again beginning to get slow dispatch. It is reported that a company is about to be formed for transporting the ore from the Sierra to the wharves. If this project is carried out it will mean new life for the mining industry of this district. The tariffs charged by the present line are so exorbitant that unless prices are booming many mines cannot be wrought that are situated any distance from the depots. At the present time merchants never know from day to day whether they can get their mineral down to load steamers fixed. Many help themselves as much as possible by bringing their ore down by carts so as not to be entirely at the mercy of the railway people. A new line would therefore be very desirable as not only would it open up fresh districts, but it would save merchants many hundreds of pounds dispatch money, by getting their mineral carried down promptly and with certainty. Ore freights are continuing very firm and higher than usual at this time of the year. During the month the steamer "Barlby" has loaded the first cargo since the war for the United States, going to Baltimore.

We quote as follows on iron ore f. o. b. Cartagena: Portman ordinary 50% ore, 6s. 3d.; special low phosphorus, 6s. 5d.; extra quality ore, 6s. 9d.; special ore, containing 50% iron and 3% manganese, 7s. 3d.; specular ore containing 60% iron, 9s. 3d. per ton. On manganiferous ores we quote, f. o. b. Cartagena as follows: No. 1, containing 20% iron and 20% manganese, 14s. 6d. per ton; No. 1 B., 25% iron and 17% manganese, 11s. 6d.; No. 2, 30% iron and 15% manganese, 11s.; No. 3, 35% iron and 12% manganese, 9s. 4d.

New York. Feb. 24.

The local market continues active, with plenty of new business coming forward. Export business is good, with new inquiries, though higher prices here may make a difference in the foreign trade.

Pig Iron.—The market is active, though no large sales are reported. There is a good deal of inquiry for material, and some foundries seem to be running short, though the majority have covered their requirements for the first half of the year. The present talk about higher prices is rather disturbing, but so many rumors are afloat that buyers hardly know what to believe. In the absence of definite figures for changes, we have to 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 there has been an advance of about 50c. Alabama No. 2 is $9⅜; No. 3, $8⅞; No. 4, $8⅜; gray forge, $8½.

Cast Iron Pipe.—It remains to be seen whether or not the combination controlling the South and West will try to discipline outside mills in the East, but prices during the last few years have shown that Eastern mills can look out for themselves. It will be interesting to see if Eastern mills try to get the contract for 2,500 tons of 36-in. pipe for Washington, D. C., to be let March 11th.

Structural Material.—The contract for the East River Bridge work has been awarded to the New Jersey Steel and Iron Company. This company's

bid was about $10,000 above the lowest, that of the Pennsylvania Steel Company. The work will require about 5,000 tons of shapes, and 7,000 tons of plates. A good deal of other work is coming on the market.

Steel Rails.—Prices have advanced again, and now are high enough to interfere with export business, unless, as is quite possible, concessions are made. The favorable position of the Sparrow's Point plant, now that ore shipments from Santiago are resumed and the Government is allowing drawbacks on exported steel, is worthy of note. We quote standard sizes $22 f. o. b. mill.

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, ¼-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, 1.37½c.; charcoal iron plates, 2.25c. for shell, 2.75c. for flange; iron rivets, 2.25c.; steel rivets, 1.75@1.85c.

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.

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. 24, 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	$2,330 563
Imports	6,493 414	6,066,080	6,493,414	6.066,080
Excess	I. $3,834.751	I. $3,735,577	I. $3,834,751	I $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	E. $2,767,182	E $1,766,359	E. $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. 23d, 1899, and for years from January 1st, 1899, 1898, 1897, 1896.

Period	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports	
We'k	$10,280	$28,935	$575,263	$92,054	E. $464,554
1899..	385,111	3,579,613	4,635,892	568,283	E. 833,107
1898..	3 429,036	4,073,002	7,1 7,305	446.415	E. 6,016,984
1897..	520,351	481,875	6,365,304	358,095	E. 6,045,685
1896..	9,748,885	15,856,866	6,434,145	277,015	E. 49,149

Exports and imports of gold were both in small parcels. Exports of silver were chiefly to London; imports were from the West Indies and South America.

The United States assay office in New York reports the total receipts of silver at 129,000 oz. for the week.

Financial Notes of the Week.

Business continues active and there are signs of still further expansions in some lines of trade. The speculative markets are recovering from the recent reaction, and show further signs of strength. The iron and metal markets are getting into the speculative list. The iron trade is presenting a number of new industrial stocks for market use. The outbreak at Manila has affected the exchange very little.

Money continues easy in New York. There is still enough difference between rates here and in Europe to keep a large amount of capital on the other side, and to postpone any movement of gold in this direction.

Special shipments from San Francisco by water during the month of January were as follows:

	Gold.	Silver.	Totals.
Hongkong	$2,055	$492,049	$494,104
Shanghai	.....	218,888	218,888
Total foreign	$2,055	$710,937	$712,992
Honolulu	$250,000	.....	$250,000
New York	7,324,470	3,652	7,328,122
Totals	$7,576,525	$714,589	$8,291,114
Totals, 1898	3,758,178	843,433	4,601,611

The silver shipments included $3,652 in United States coin, $554,658 in bars, and $156,259 in Mexican dollars. There was a large decrease in the Mexican coin, the shipments in January, 1898, having been $497,171.

Several special orders at 27½d. having been satisfied, the silver market receded to 27⅜d. At this figure business is quiet. Orders do not appear to have come from the Eastern banks, but belonged to the class called outside.

The statement of the United States Treasury on Thursday, February 16th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date of last week:

	Feb. 16.	Feb. 23.	Changes.
Gold	$227,551,454	$228,226,278	I. $674,824
Silver	8,473,432	8,810,437	I. 337,005
Legal tenders	15,350,555	15,257,749	D. 102,806
Treas. notes, etc...	1,987,121	1,726,071	D. 261,050
Totals.	$253,372,562	$254,020,535	I. $657,973

Treasury deposits with national banks amounted to $86,527,105, a decrease of $771,991 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending February 18th, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

	1897.	1898.	1899.
Loans and discounts	$498,747,600	$646,915,200	$758,611,000
Deposits	572,670,600	738,560,600	897,172,300
Circulation	16,613,400	13,778,100	14,512,300
Reserve:			
Specie	82,817,000	116,833,800	202,165,300
Legal tenders	116,016,600	93,494,800	56,531,600
Total reserve	$198,833,600	$210,328,600	$258,696,900
Legal requirement	143,167,650	184,640,150	224,293,075
Balance surplus	$55,665,950	$25,688,450	$34,373,825

Changes for the week, this year, were increases of $8,567,700 in loans and discounts, $9,113,200 in deposits, and $3,634,000 in specie; decreases of $21,300 in circulation, $2,493,700 in legal tenders, and $1,138,000 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:

	1898.		1899.	
Banks	Gold.	Silver.	Gold.	Silver.
N. Y. Asso.	$116,833,800	.....	$202,135,300	.....
England	170,186,075	.....	170,314,255	.....
France	.....	.....	.....	.....
Germany	156,985,000	$80,870,000	141,130,000	$72,705,000
Aus.-Hun.	182,085,000	62,075,000	178,940,000	62,220,000
Spain	47,505,000	53,250,000	55,395,000	44,575,000
Belgium	14,115,000	7,060,000	15,570,000	7,885,000
Netherlands	13,190,000	34,250,000	21,570,000	34,000,000
Italy	77,990,000	10,670,000	75,145,000	11,720,000
Russia	585,040,000	20,000,000	497,050,000	21,795,000

The returns for the Associated Banks of New York are of date February 18th, the Bank of England February 23d, and the others are of date February 16th, 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. The Bank of France issued no statement this week, being closed on account of President Faure's funeral.

Shipments of silver from London to the East for the week ending February 9th, 1899, are reported by Messrs. Pixley & Abel's circular as follows:

	1898.	1899.	Changes.
India	£740,000	£459,000	D. £281,000
China	113,096	205,380	I. 92,284
The Straits	89,000	5,000	D. 84,000
Totals	£942,096	£669,380	D. £272,716

Arrivals for the week, this year, were £167,000 in bar silver from New York, £29,000 from the West Indies, £21,000 from Chili, and £1,000 from New Zealand; a total of £218,000. Shipments were £47,500 in bar silver to Bombay.

Indian exchange continues remarkably steady, as imports from India are good. The Council bills offered in London sold at an average of 16.09d. per rupee. Considerable shipments of gold from Australia to India on London orders are reported.

The foreign trade of Great Britain in January is given by the Board of Trade returns as follows:

	1898.	1899.
Imports	£39,920,291	£41.216,606
Exports	23,914,065	25,467,494
Excess, imports	£16,915,226	£15,749,112

The imports increased £1,287,315, or 3.2%, and the exports £1,553,429, or 5.8%. The movement of gold and silver for the month was as follows:

Gold:	Exports.	Imports.	Excess.
1899	£1,891,026	£2,430,637	Imp. £539,611
1898	3.488,609	3,061,112	Exp. 427,497
Silver:			
1899	1.225,835	1,167,178	Exp. 58,657
1898	1,410,916	1,286,481	Exp. 124,435

Of the silver imported this year £798,039, or 68.2% came from the United States.

Daily Prices of Metals in New York.

1 February	Sterling Exchange.	Silver. Fine oz. Cts.	Silver. London, P'nce	Copper. Lake, cts. ℔ lb.	Copper. Electrolytic, ℔ lb.	Copper. Lond'n standard £ ℔ ton.	Tin, cts. ℔ lb.	Lead, cts. ℔ lb.	Spelter, cts. ℔ lb
18	4.86	59¾	27½	18	17	.....	23⅞	4 42½	6.50
20	4.86	59¾	27½	18	17	73 0 0	24	4.42½	6.60
21	4.86	59¾	27½	18	17	71 15 0	24¼	4.42½	6.60
22	.....	.....	27½	.....	.....	72 0 0	.....	.....	.....
23	4.86¼	59½	27⅜	18	17	72 10 0	24⅜	4.42½	6.55
24	4.86	59½	27⅜	18	17	72 15 0	24¾	4.42½	6.55

Average Prices of Silver per oz. Troy.

Month.	1899. Lond'n Pence.	1899. N. Y. Cents.	1898. Lond'n Pence.	1898. N. Y. Cents.	1897. Lond'n Pence.	1897. N. Y. Cents.
January	27.42	59.36	26.29	56.77	29.74	64.79
February	.....	.....	25.89	56.07	29.68	64.67
March	.....	.....	25.47	54.90	28.96	63.06
April	.....	.....	25 95	56.02	28.36	61.85
May	.....	.....	26.31	56.98	27.86	60.42
June	.....	.....	27.09	58.61	27.58	60.10
July	.....	.....	27.32	59.06	27.36	59.61
August	.....	.....	27.48	59.54	24.93	54.19
September	.....	.....	28.05	60.68	25.66	55.24
October	.....	.....	27.90	60.42	26.77	57.57
November	.....	.....	27.93	60.60	26.87	57.93
December	.....	.....	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.

Average Prices of Metals per lb., New York

Month.	COPPER. 1899.	COPPER. 1898.	TIN. 1899.	TIN. 1898.	LEAD. 1899.	LEAD. 1898.	SPELTER. 1899.	SPELTER. 1898.
Jan	14.75	10.99	22.48	13.87	4.18	3.65	5.34	3.96
Feb	.....	11.28	.....	14 08	.....	3.71	.....	4.04
March	.....	11.98	.....	14.38	.....	3.72	.....	4.25
April	.....	12.14	.....	14.60	.....	3.63	.....	4.26
May	.....	12 00	.....	14.52	.....	3.64	.....	4.27
June	.....	11.89	.....	15.22	.....	3.82	.....	4.77
July	.....	11.63	.....	15.60	.....	3.95	.....	4.66
August	.....	11 89	.....	16.23	.....	4.00	.....	4.58
Sept	.....	12.31	.....	16.03	.....	3.99	.....	4.67
October	.....	12.41	.....	17.42	.....	3.78	.....	4.98
Nov	.....	12.86	.....	18.20	.....	3.70	.....	5.29
Dec	.....	12.93	.....	18.30	.....	3.76	.....	5.10
Year	.....	12 03	.....	15.70	.....	3.78	.....	4.57

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

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$ .47¼	$ .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.

Copper.—The market has not developed any new features. The transactions have been few and of a retail character only. It has been reported during the last few days that the Calumet & Hecla is again ready to sell Lake at 18c., and that is now the price for that description. Electrolytic copper has been more or less neglected, and the price is nominally 17@17½c. for cakes, wirebars and ingots, and 16¾@17¼c. for cathodes, with casting copper nominally 17c.

The foreign market, which closed last Friday at £72 15s., opened on Monday at £73, declined subsequently to £71 10s., but closes firmer today at £72 12s. 6d.@£72 15s. for spot, with three months prompt at £72 7s. 6d.@£72 10s. While from day to day heavy transactions in the speculative kinds took place on the Metal Exchange there, business in refined copper is as restricted as it is here. Manufacturers over there appear to have made up their minds, the same as they have here, to await further developments before supplying themselves any further ahead than they have already done. Considering that producers in Europe have sold their product for several months in advance, it is just as unlikely that for some time there will be a serious decline there as for the same reason it is here. We quote: English tough, £77@£77 10s.; best selected, £77 10s.@£78; strong sheets, £83; India sheets, £80; yellow metal, 7d.

Copper imports into Great Britain in January included 8,835 tons ore (3,332 tons in 1898); 8,737 tons matte and precipitate; 4,852 tons fine copper (4,404 tons in 1898). The total this year was equivalent to 9,309 long tons of fine copper. The United States furnished this year 1,440 tons matte and 2,404 tons fine copper.

Tin has improved not inconsiderably, for while at the end of last week the metal was selling at about 23¼c., the price has since advanced to 24¾c.

The London market, of which ours has been a reflection, closed last week at £104 10s., and has since by leaps and bounds advanced to £109@£109 2s. 6d. for spot, and £108 15s.@£108 17s. 6d.

for three months prompt, which are the closing figures.

Imports of tin into Great Britain in January were 1,739 long tons, against 2,693 tons in 1898.

Exports of tin from the Straits Settlements for the year ending December 31st are reported as below in long tons of 2,240 lbs.:

	1896.	1897.	1898.
United States	15,077	19,483	22,901
European ports	31,944	22,064	21,599
India and China	6,118	3,214	2,551
Totals	53,139	44,761	47,051

The total in 1898 exceeded that of 1897 by 2,290 tons, or 5.1%; but was less by 6,088 tons, or 11.%, than in 1896.

Lead.—The market is again very quiet and prices have been crumbling away, there being sellers now at 4.42½c., and but very few buyers. Were it not that refiners as a general thing are not quoting, prices would be still lower, but it must be admitted on the other hand that, if at any time in the near future there should spring up a demand for consumers—as will probably be the case, considering that they have bought only very sparingly, and in some cases appear to be very poorly supplied—the market may experience a not inconsiderable improvement, especially if the rumored consolidation of a number of refiners should become a fact, as such an event will probably result in a great deal of speculation and consequently higher prices, even if they should not be permanently maintained.

The foreign market is lower, at £14 for Spanish and £14 2s. 6d. for English lead.

Imports of lead into Great Britain in January were: Australia, 9,997; Spain, 6,156; United States, 2,558; other countries, 990; total, 19,701 long tons, against 11,968 tons last year.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is firm, but very quiet; common metal brings 4.25@4.27½c.; corroding lead, 4.30c.

Spanish Lead Market.—Messrs. Barrington & Holt writes us from Cartegena, under date of February 4th, as follows: In the month of January the average price of lead was 70 reales per qtl., equivalent to £11 19s. 7d. per long ton on an average exchange of 32.71 pesetas to the £1, silver having remained for the month at the price of 14,25 reales per oz. The weekly prices per qtl. of lead were as follows: January 4th, 67.75 reales (£11 13s. per long ton); 11th, 70 reales (£11 19s. 3d. per ton); 18th, 71.50 reales (£12 4s. 7d. per ton); 25th, 70.75 reales (£12 1s. 6d. per ton). The weekly price of silver was 14.25 reales per oz. The weekly average exchange values of silver were as follows: January 4th, 32.56 pesetas; 11th, 32.75 pesetas; 18th, 32.72 pesetas; 25th, 32.80 pesetas to £1 sterling. Exports of pig lead in January were 1,836,607 kilos to London, 1,450,952 kilos to Marseilles, 512,439 kilos to Newcastle; total, 3,799,998 kilos. Other exports have been 1,250,000 kilos zinc ore to Antwerp, and 1,407 kilos of spelter to Marseilles.

Spelter continues in excellent demand, and the recent advance has not only been fully maintained but there has been a further rise, especially for near deliveries. The requirements have been so extraordinarily large during the last few weeks that there is almost a famine; 6.55c. has been paid.

The foreign market has remained steady at £28 for ordinaries and £28 5s. for special brands.

Imports of zinc (spelter) into Great Britain in January were 6,993 long tons, against 6,958 tons in 1898, and 4,980 tons in 1897.

Antimony is without any change. Cookson's, 10½c.; Hallett's, "C" and U. S. Star, 9¾@10c.

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.

Platinum.—Demand is active and prices continue high. For large lots $15.50 per ounce is now quoted in New York; for smaller order $16@$17. The London quotation is 62@64s. an ounce.

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

Quicksilver receipts at San Francisco in January were 2,211 flasks, against 1,862 in 1898 and 1,264 in 1897. Shipments by sea for the month were: Mexico, 310; Central America, 125; Australia, 10; New York, 8; total, 453 flasks, against 369 last year.

Quicksilver imports into Great Britain in January were 45,150 lbs. (447,710 in 1898). The exports were 308,615 lbs. (183,600 in 1898). The stocks were therefore reduced by 263,465 lbs. during the month.

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

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

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

Imports and Exports of Metals

Port.	Week, Feb. 22. Expts	Impts.	Year, 1899. Expts.	Impts.
***New York.**				
Aluminum, long tons	40	... ...	112	10
Antimony ore, " "	... ..	.....	.....	184
" regulus, " "	.....	.....	.....	30
" oxide " "	.....	11	... ...	11
Chrome ore " "	.....	.....	.....	110
Copper, fine " "	823	160	8,349	455
" wire, " "	.....	.....	189	.....
" matte, " "	6	....	240	315
" ash, " "	... ...	.....	...	31
" sulphate " "	198	.....	1,324	.....
" other, " "	.....	.....	.....	30
Ferro-chrome, " "	.....	.....	.....	...
Ferro-mangan'se " "	.....	.....	... ...	.....
Ferro-silicon, " "	.....	.....	.....	.....
Iron ore " "	...	.....	5	...
" pig, bar, rod " "	284	.....	986	439
" pipe " "	282	.....	4,037	.....
" plates " "	.....	.....	85	.....
" other, " "	...	.....	235	...
Lead " "	475	690	8,213	6,413
ore " "	.....	.....	.....	...
Manganese ore, " "	.....	.....	.....	129
§Metals, old " "	20	.....	159	378
Composition, " "	...	.....	573	.....
Nickel " "	...	...	267	.....
§Railr'd material " "	144	.....	1,440	220
Rails, old " "	.....	.....	2,233	.....
Spiegeleisen " "	.....	.....	...	48
Steel billets, etc., "	1,303	.....	6,266	1,951
" rails, " "	1,532	.....	12,894	.....
" hoops, " "	...	.....	270	.....
" wire, " "	1,027	.....	3,666	.....
" nails, " "	744	.....	2,921	.....
" not speci'd, " "	14	.....	1,583	289
Tin " "	.....	535	.....	4,185
" dross or ashes " "	.....	....	48	...
" and black plates boxes	.....	.....	.....	46,812
Zinc long tons	.....	.....	.....	12
" dross, " "	7	.....	71	...
" dust or ashes " "	104	.....	202	.....
" ore, " "	...	.....	801	.....
" oxide " "	118	.....	595	48
" skimmings, " "	10	... ...	170	.....
†Baltimore.				
Aluminum, long tons	.....	.....	.....	.....
Antimony regulus, casks	.....	.....	.....	...
Brass scrap, long tons	.....	.....	.....	.....
Chrome ore, " "	.....	.....	.....	.....
Copper, fine, " "	305	.....	3,795	.....
" matte, " "	.....	.....	...	.....
" sulphate " "	196	.....	518	.....
Ferro-manganese " "	.....	98	....	647
Ferro silicon, " "	.....	.....	...	50
Iron pig, bar, etc. " "	1,630	.....	2,100	1,105
" ore, " "	.....	.....	...	26,624
" pipe, " "	11	.....	1,741	.....
" pyrites, " "	.....	.....	.....	6,584
" other, " "	....	.....	1	5
Lead " "	...	.....	...	.....
Machinery, " "	...	.....	115	.....
Manganese ore, " "	....	.....	3,203	.....
Metals, scrap, " "	.....	.....	207	.....
" piegeleisen, " "	.....	.....	...	34
Steel, bars, pl'es, &c. "	914	....	8,769	48
" wire " "	93	14	144	114
" rails " "	.....	.....	2,000	.....
" nails " "	41	.....	125	.....
" pipe, " "	...	.....	573	.....
not specified, " "	14	.....	23	.....
Tin " "	.....	...	.....	44
" dross, " "	.....	.....	.....	.....
" and black plates, boxes	.....	440	.....	440
Zinc, long tons	.....	.....	18	.....
" dross " "	.....	.....	17	.....
***Philadelphia.**				
Antimony, casks	.....	... ...	.....	.....
Chrome ore, long tons	.....	.....	.....	.....
Copper ore, " "	.....	....	.....	7,174
Ferro-manganese " "	.....	.....	... ...	70
Iron, pig, " "	... ...	...	.....	.....
" ore, " "	.....	.....	.....	7,250
" pyrites, " "	.....	.....	...	.....
Manganese ore, " "	.....	... ...	...	11,360
Spiegeleisen, " "	....	....	.....	300
Steel " "	....	.....	.....	.....
Tin, " "	....	.....	.....	235
" and black plates, boxes	.....	.....	.....	...
Zinc ore, long tons	.....	.....	1,675	.....

*New York Metal Exchange returns. †By our Special Correspondent. §Not mentioned elsewhere.

MINING STOCKS.

Complete quotations will be found on pages 253, 254 and 255 of mining stocks listed and dealt in at:

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

New York. Feb. 24.

The week's speculation has been broken by the holiday on Wednesday, and the trading that has been done was comparatively limited in volume. Probably the most inquiry at present is for dividend-paying stocks. In connection with the Colorado stocks, especially those of the Cripple Creek District, it may be noted that during January and February the dividends distributed have amounted to fully one-fifth of the entire distribution in the year 1898. At the present rate it is very likely that the dividends in 1899 will nearly double those of 1898, just as that year doubled 1897. In the month of February alone there were 10 companies in Cripple Creek that paid dividends from $5,000 to $135,000, showing a grand total of over $378,000, or over $94,000 more than in February, 1898, and $34,000 more than in January, 1899. It is estimated that the total dividends paid by Cripple Creek companies to date is over $7,536,000.

Of the Colorado stocks traded in, Isabella has sold at $1.15, ex-dividend, and at the close to-day it changed hands at $1.25. Telegraphic advices from the West state that this stock shows a further drop, and has sold at $1.16. Elkton Consolidated lost 2c. at $1.08 early in the week, but recovered again to $1.10, and at the close holders continue to ask this price. Portland held pretty well between $1.89@$1.91. Small Hopes of Leadville rose from $1.25 to $1.40, in consequence of the dividend of 10c. per share. Breece has sold up to $1.50, but receded to $1.30, and bids are made at close around this figure.

Of the Comstocks, Ophir has been quoted up to $1.40.

In the California section, Standard has risen to $3 on one sale, and is firm at the close around $2.80. A dividend is expected when the company's capitalization has been reduced. Brunswick appears in a better condition, and sales are reported at 31c. The quicksilver stocks receive little attention on the Exchange, while at auction there was a sale of 100 shares at $1.90 each.

Horn Silver of Utah has gone up to $1.55, and Ontario holds steady at $5.75.

On the curb last Tuesday sales of 300 shares of the Markeen Copper Company were reported at $6.50, and to-day bidding is at $6.25, while sellers ask $6.50.

Auction sales included 17 shares of Sunday Creek Coal Company preferred stock, at $46 for the lot; 82 shares of Pennsylvania Coal Company at $380.

Boston, Feb. 23.

(From Our Special Correspondent.)

The market for copper stocks has been extremely active, in spite of the interruption of the Wednesday holiday. It has been a very unsteady market, too, with numerous fluctuations both up and down. In fact, it might be called a wild market, in which there were all sorts of unexpected changes. Upon the whole, the tendency has been upward, but raids were made on one or two of the speculative stocks with some effect.

The gold stocks have been in favor, as well as the coppers, and dealings in them have been large. The leading favorites among these is North American Gold Dredging, sales of which were large, notwithstanding the high price to which it has been worked up within the past two weeks.

The Calumet & Hecla dividend of $40 a share, bringing up the return for the fiscal year to $70 a share, is bigger than was expected, but does not seem out of proportion to the returns of the year. The announcement lifted the stock to $890, which is equal to $850, dividend off, and there is a fair chance of reaching $900.

Reports continue to circulate about the great consolidation to be effected by the new American Copper Company, which is to take in all the producing copper mines in the United States. At present its interests are in charge of H. H. Rogers and A. C. Burrage, and they do not seem to have made very much headway yet.

It is proposed to increase the stock of the old Washington Mining Company from 40,000 to 100,000 shares, in order to develop the property and bring it into producing shape. The stock is now selling at $4.

The Allouez Company will hold its annual meeting in New York, March 14th next.

The Wyoming Consolidated Copper Company is floating in Boston. It was incorporated in Wyoming, and three of the five directors are Wyoming men. The secretary, Edmund H. Noyes, is the only Boston director. Capital stock is $1,000,000, par value of shares, $25; flotation price of the first block of 2,500 shares is $6.25. The company owns 360 acres of mineral land, in 18 claims, extending 4½ miles, over the whole of which copper ore is said to have been found in large quantities. The property is in the southern part of Wyoming, in Carbon County, near the Colorado line.

Stock of the Arizona Copper Syndicate, with claims at Clifton, Ariz., is offered at $2.50 a share; 20,000 out of 100,000 shares ($5 par) are to be sold for working capital.

There is to be another Lake Superior flotation, the Mayflower. Its property embraces the land just north of the Old Colony Mine and east of the Osceola and Wolverine mines. The Old Colony's lodes are supposed to traverse the property. Capt. Chenoweth will be in charge.

A special meeting of the Pacific Copper Company has been called to see if stockholders will authorize the directors to sell the company's property, 960 acres, northwest of the Atlantic, at Lake Superior. Of its 40,000 shares issued, 20,000 shares are in the treasury of the St. Mary's Canal Mineral Land Company.

An official circular gives notice that upward of 110,000 shares of Boston & Montana stock have been deposited under the voting trust agreement, and presents the plea of urgency for deposit of the remaining 40,000 shares.

A new Utah copper property is to be brought

out in Boston by what is known as the Globe Bank or United States Oil party, which is said to have given $600,000 for the property and will capitalize it for 400,000 shares, of which 200,000 shares wil be sold at $20, or $4,000,000, 125,000 shares going to the purchasers, and 75.000 shares remaining in the treasury.

The United States Oil people are bringing out the American Lead, Zinc & Smelting Company, with $500,000 capital stock. The property of the company is located at Joplin, Mo. The stock has been allotted at the subscription price of $20 per share, payable February 23d. Certificates will be issued about March 15th. The stock will not be listed on the exchange at present. Mr. Edward A. Clark is president of the company.

3 p. m.—To-day the market continued active and strong. In the mining stocks activity centered largely in the low-priced coppers, but nearly all were firm. Old Dominion was an exception, losing $1 to $44.50.

Parrot advanced $10 to $60; Atlantic, $41; Tecumseh, $10; Mohawk rose from $35 to $36.87½, now $36; Adventure, up $1.50 at $17.50; Allouez, $11.75; Calumet, $850, ex-dividend of $40; Montana, $372; Tamarack, $264; Quincy, $185; Arcadian, $76.50; Osceola, $102; Franklin, $28.75; Butte, $89; Tri-Mountain, $17.75; Miners', $45; Wolverine, off 50c. at $49.50; Centennial, $50; Old Colony, $21; Baltic, $34.75; Michigan, $19.50; Santa Fe, $22.75; Isle Royal, $63.50; Utah, $45.75; Bingham, $15.50 bid; Cochiti, $10.50; Union, $10; Gold Dredging, $40; Pioneer, $7.25; Rhode Island, up $1 at $13; Mass, $15.50 bid; Winona, $21.50; Arnold, $9; Victoria, $11.25 bid; Fortuna, $1.50; Catalpa, 60c.; Crescent, 50c.; Merced, $11.62½; Ysabel, $14.

Salt Lake City. Feb. 18.

(From Our Special Correspondent.)

The softening process has held sway for the past fortnight in Utah mining shares. Occasionally the bulls would boost a few favorites, but the bears generally have control, though there is no very bad slump. On the regular call this morning there were a few strong recoveries, and the week ends favorably, under the circumstances. Some aver that the decline and threatened weakness is in part attributable to the second exchange and to too many daily calls, but however that may be, a halt in the boom is a healthy change. Sales for the week all told were 789,875 shares, which brought $163,621.

Ajax has held the advance made after the annual meeting. Grand Central appears to have landed on bed rock, and there is no more talk of litigation. Mammoth is stronger and higher, with reported fresh ore uncoverings. Lower Mammoth has witnessed an eventful fortnight, and after lively fluctuations closes firm just under the $1 notch. Bullion-Beck paid its $10,000 dividend February 15th, and is in better form. Swansea and South Swansea remain firm and unchanged. Four Aces to-day did a lively business, selling freely down to 51c. and then recovering to 56c. Centennial-Eureka paid the usual $15,000 dividend on the 15th, and has moved up several points. Homestake hangs around 10c. Sunbeam has afforded the current surprises and closes 41½c. bid, 43c. asked. Star Consolidated ends the week lower than last Saturday, though a recovery may be counted on. Eagle & Blue Bell has again advanced to $2. Joe Bowers has dropped under 20c., with an excellent demand for all offerings.

Mercur has recorded sales at $6.25. It would seem that there are considerable offerings at that figure. Daisy hangs around 50c. Geyser-Marion is strong at 86c. bid, 91½c. asked. Chloride Point was a little weaker, due to the shutting off of the electric power by the recent severe storm. It would seem that this trouble will certainly be at an end after this month. Northern Light has been on the down grade, partly due to the snow blockade. Latest word from the mine is encouraging. Sunshine is dropping back. Omaha is stationary. Sacramento appears to have taken a strong stand at 45c. Little Pittsburg is higher and firmer.

Dalton & Lark has done more trading than common, but the attempt to boost the shares is only partly successful. Dexter has gradually succumbed to profit-taking and closes $2.85 bid, $3.10 asked. Galena is practically unchanged. Utah is a shade lower. Dalton holds about $3, doing a brisk business. Daly West closed $9.60 bid, $10 asked. The final steps are taken in the reorganization, and the unincorporated half given representation—the number of shares being increased to 150,000. Active operations will begin March 1st. Ontario fairly well holds the advance. Daly is somewhat weaker. The annual meeting occurs on Monday. Anchor advanced in the bidding. Valeo has again softened below $1.50.

San Francisco, Feb. 18.

(From Our Special Correspondent.)

Stocks continue to be strong, so far as the quotations go, and a fair show of dealings is made; but the trading continues to be inside business altogether. The public is not attracted by the advances, and outside buying orders are still wanted. Even the attraction of a rising market does not bring them in.

Various stocks profited by the movement, the latest to attract special attention being Yellow Jacket, which seems to have been taken up for no special reason. Hale & Norcross also had some attention, while Mexican made a third.

Some quotations noted are: Consolidated California & Virginia, $2.30; Ophir, $1.25@$1.30; Sierra Nevada, 99c.; Mexican, 83c.; Best & Belcher, 69c.; Gould & Curry, 47c.; Hale & Norcross, 35c.; Yellow Jacket, 35@37c. There was some business in Standard Consolidated at $2.85@$2.90.

According to the monthly statements filed in their offices, as required by law, the following companies report having had cash on hand February 1st, 1899, with all expenses paid to that date, unless otherwise stated: Alta, $164, with $1,000 due the bank and the mine expenses partly paid to date; Andes, $2,569; Alpha Consolidated, $2,489; Belcher, $1,044; Best & Belcher, $3,011; Bullion, $1,594; Caledonia, $4,700; Chollar, $6,238, with bills payable of $779; Consolidated California & Virginia, $16,233; Consolidated New York, $719; Crown Point. $3,094; Confidence, $1,588; Challenge Consolidated, $253; Consolidated Imperial, $1,537; Exchequer, $174; Gould & Curry, $8,348; Hale & Norcross, $2,118; Julia Consolidated, $401; Justice, $259; Mexican, $3,843; Ophir, $2,623; Overman, $63; Potosi, $6,180; Savage. $8,222; Segregated Belcher, $55; Sierra Nevada, $2,772; Silver Hill, $101, with $1,000 due on the company's notes; Scorpion, $125; Standard Consolidated, $49,047; Syndicate, $1,471; Union Consolidated, $12,452; Utah Consolidated, $1,819.

London. Feb. 10.

(From Our Special Correspondent.)

The South African mining market continues active. People have been buying shares without having any very definite reason, but chiefly because they saw other people buying. There is no doubt that the boom was engineered with the object of floating off the new issue of Chartered a week or two ago, and the result has been entirely successful, for the required money came in without any hesitation. The amount of business done during the past fortnight has evidently been considerable, for the current settlement is heavy.

The copper share market has been very active in sympathy with the boom in the price of the metal. Anacondas stand at £9, and Rio Tintos at £39, while most of the other companies show some advance. Certain people in London allege that the present high prices of copper and tin are due directly to the efforts of Rothschilds and Rockefellers to create a corner in the metals, and some sections of the press print such opinions. Mr. Wilson, the editor of the "Investors' Review," leads the way in giving these opinions, but he found it impossible to support them by facts when challenged by the Rothschilds, and he had to eat his words most humbly.

The South African boom has encouraged Sir John Willoughby to bring out yet another subsidiary company to operate his Rhodesian properties. This is the Surprise Gold Mining Company, Limited, to work the Surprise Mines, which are situated 10 miles south of Givel. The mines have been operated extensively in some time long past, and the surface workings show from 10 to 14 dwts. per ton. Exploration work has shown the presence of 1 oz. stuff, sufficient to warrant development on a large scale.

The Bennett Lake & Klondike Navigation Company, Limited, one of Sir Charles Tupper's companies, is offering 40,000 more shares for public subscription at a premium of 5s. per share, making the issue price 26s. This company was formed rather less than a year ago, to finance Mr. Rattenbury's scheme for running steamers from Bennett Lake to Dawson City. This scheme was started after Sir Charles Tupper's own company, the New Goldfields of British Columbia, Limited, had made a failure of a similar project. Mr. Rattenbury established a line of steamers, and during the season of 1898 ran them at considerable profit. It is now proposed with the additional capital to purchase more steamers and establish various trading posts.

It is not often that Russian mining propositions are put before the London public, but one has made its appearance this week. This is the Oural Gold Fields of Western Siberia, Limited, with a capital of £240,000, to work several quartz propositions in the Ketchkar District in Orenburg. These properties are in working order, and are fully equipped, and the average returns run from 0.7 oz. to 1.4 oz. to the ton.

Paris. Feb. 5.

(From Our Special Correspondent.)

The situation is somewhat better than I have had to report lately. There is less political anxiety—though the situation has not cleared itself yet, by any means—and money is to be had at lower rates. The Bank of France still keeps its discount rate at 3%, but in the open market rates are lower than for several weeks. Accordingly, we have had a stronger market, with more attention paid to mining stocks.

The metallurgical stocks are still in demand and have shown many dealings. There have been some advances, but in most cases prices are little changed. Acieries de France and Acieries de la Marine have been most in demand.

The Acievies de Trignac have declared a dividend of 25 fr. a share, besides charging off 196,000 fr. for depreciation, improvements, etc., and carrying 300,000 fr. to the reserve fund.

The Russian group is still very much in evidence, and most of these stocks have reached a very high level. It is true that the country presents room for a great expansion, but it will take a long time. Moreover, most of the Russion works are new, and have much to do yet in the way of building up their trade, enlarging their plants and other preparatory work before they can be considered as definitely placed among the profitable enterprises.

The Societe le Nickel, it will be remembered, devoted all its profits for the year ending June 30th last to the reduction of its debts. It is now reported that adividend will be declared for the half-year ending with December. The stock sold at 300 fr. this week.

The zinc companies have realized advances, especially Vieille-Montagne, which is just now the only European company which has heavy reserves of ore and can increase its production largely. The demand for zinc is very active, and it is impossible to obtain early deliveries of the metal.

The speculation in copper and that in copper stocks run together, and we have very high prices for shares, nearly all of them showing advances. There is one exception, however, Cape copper having fallen sharply. Boleo is much higher, having sold this week at 2,210 fr.

The Transvaal gold stocks are fairly active, and there are signs of a renewed speculation of importance. The London market has revived, and our own is moving in sympathy. It is, perhaps, well that an opportunity should be given for our people to recover some of the losses of two or three years ago; but it is to be hoped that they will not go on and invest in the new projects which are being brought out, and the old ones that are being revived to catch the new interest. That would be a serious mistake.

As to the reputed copper convention, I hear again that approaches have been made to the Rothschilds and others, by parties from your side, but nothing has been done. Moreover, nothing will be done until certain guarantees are presented, which are still lacking. It does not appear that sufficient progress has been made yet toward uniting the American companies to warrant talk of a general convention.

Meantime the demand for copper continues very good, though not quite as strong as some of the speculators would have us believe.

A good deal of interest is felt at the present time in the electrical power companies, of which new ones are springing up constantly. These companies seem to have a future before them, and the opportunity of establishing a profitable business, if they are well managed. Most of them are too new to have established values for their shares yet.

So you are feeling the trouble and burdens of colonial extension and rule? Well, you have a chance to profit by our experience and make more of your new tropical dominions than we have made of ours. I trust you will not neglect your opportunities.

Azote.

LATE NEWS.

Mr. F. C. Poisson, of the Mexican Gold Fields, Limited, has just reached New York from Mexico, on his way to England.

Mr. Frank C. Nicholson has just returned to New York from a professional trip to the zinc region of Southwestern Missouri, and to Arkansas.

He reports the Santa Elena Mine in excellent condition, one of the great properties, in fact, and the cyanide works in successful operation.

Cleveland dispatches report negotiations closed for the sale of the stock of the Lake Superior Iron Company, which owns considerable mining property in the Lake Superior District and a fleet of vessels on the Great Lakes. It cannot be learned who is negotiating for the property, but the general opinion is that it is either the Federal Steel Company, the American Steel and Wire Company, or the Carnegie Steel Company. There is very little doubt that the deal is practically closed. President W. R. Watterson of the company has sent out a circular letter to the stockholders, saying that negotiations are pending for the sale or control of the property upon very advantageous terms.

STOCK QUOTATIONS.

NEW YORK.

Name of Company.	Location.	Par val.	Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22.* H.	Feb. 22.* L.	Feb. 23. H.	Feb. 23. L.	Feb. 24. H.	Feb. 24. L.	Sales
Adams Con	Colo.	$10	.5		20		2)								500
Alamo	"	1			.10	.07	.07				.07		.07⅛	.06⅛	5,000
Alice	Mont.	25	9	.85	.9	.85	.9	85							
Alliance	Utah	1	9		.19		.19								
Anaconda Gold	Colo.	5	58	.54	.58	.57⅛	.59	58			52	50	62	.59⅛	11,000
Anchoria Lel.	"	1	.97	95	.95		98	.95			.98		1 02	.98	3,500
Argentum-Jun.	"	2	33		3.										
Belcher	Nev.	3	.35		25		.30								
Best & Belcher	"	3	.75		.65	60	82	.78							600
Breece	Colo.	25	1.4		1.40		1.50	1.30			1 50				350
Brunswick	Cal.	1	3		3	25	31				.31				4,500
Burt Gold	Colo.	1	.6⅛		.05⅝	.05⅝	06½				.06⅝	.06	.07	.06⅝	52,200
Chollar	Nev.	3	.40		.40		44	.40							
Chrysolite	Colo.		16		.12		12								100
Comst'k T'n'l b'ds	Nev.	100	.05		0		.06								
do. stocks	"	100	.06		.06		06								
do. scrip	"	100	.05		06		.06								
Con. Cal. & Va.	"	2	2 35		2.35	2.00	2 85				2 25				800
Cr. & Cr. Creek	Colo.	1	.5		05		05								
Crescent	"	10	11		07		12								
Cripple Cr. Con.	"	1	.1¾	.10	2	.11	.13	.12			.11	.10⅛	.11	.10⅛	42,300
Crown Point	Nev.	3	.3		30	21	3)	25							
Deadw'd Terra	S.Dak	2	55	45	5	4	6								
Elkton	Colo.	1	1.08		1 10	1.08					1 082	1.08	1.10	1.07	3 100
El Paso	"	1													
Enterprise	"	1	3		30		30								
Fanny R.	Colo.	1													
Findley	Colo.	1													
Garf. Con.	Colo.	1	.12⅛	12	12⅛		.13⅛	.13			.14		15	.12	13,500
Gilp & Lincoln	Colo	1	40⅛	.40	.40⅛	40⅛	40⅛	4.¼			40⅛		.40⅝	40⅛	7,800
Gold Coin C Ck	Colo.	1	1 75		1 775	1.75	1 8				1 85		1 9	1 85	3,000
Gold Coin Gilp	Colo	5	40		40		.42						80	4	
Golden Fleece	Colo	1	.40		.40	.38	40				40		42	.39½	5,600
Gold King	"	1													
Gould & Curry	Nev.	3	50	.45	5	.53	.65	60							1,100
Gregory Gold	Colo	1	.05¾		05¾	.05⅛	6⅛	66			.06⅛	06⅛	.06¾	.06⅛	232,0
Hale & Norcross	Nev	3	.34	30	33		35				44				5
High Five	Colo.	1	.10⅛		1.1¼	.11	11⅛	.10⅛			11⅛	.1¼	12	.11⅛	93,700
Homestake	S.Dak	100	50 00		50 00		50 00								
Horn Silver	Utah	25	1 50		1.3	1 30	1 50				1.35				700
Iron Silver	Colo	20	.80	9	.80		.80								
Isabella	Colo.	1	1 20		1.25	1 17	1 15				1.34	1.30	1.25	1 2	4,400
Jefferson	Colo.	1	06¾	.06⅛	.06⅛		.07				.07		0.	0.	20,000
Jennie Blanch	"	1	37	.36⅝	36¾	.36	37				36¾		.37	36⅛	16 500
Just ne			.03⅛		.03⅛		.04						04	.03⅛	3,000
King & Pemb.	Ont.		.16	15	17	.15	15								
Leadville Con.	Colo.	10	13	09	14		.13	.10			14				1,200
Little Chief	"	5	.20	18	.2	.18	2	8							
Mexican	Nev.	3	.75	65	65	20	80	.75			75				200
Miami	Colo	1	06		06		06								
Mollie Gibson	Colo	1	25		.25	25	.28	27			.28¾	25	28	.25	9,600
Moon Anchor	Colo.	1													
Mt. Rosa	"	1	.28⅝	27	29	.28	30⅝				.31⅛	29			7,900
Ontario	Utah	100	5 75		5.75										
Ophir	Nev.	3	1 40		1.4		1 35	1.3							1,100
Pharmacist	Colo	1	.06		.06		.06								2,500
Phœnix	Ariz.	1	.08		08	07	08								6,800
Pinnacle	Colo.	1													
Plymouth Con	Cal.	10	10				1								
Portland	Colo.	1	1 90		1.9	1.89	1 9				1 875		1.9	1 85	2,200
Potosi	Nev.	3	3		4		35	.34							3,0
Quicksilver	Cal.	100	1.25		1 25		1 2								
do. pref	"	100			4 5		5 9								
Rocky Mtn	Colo.	1	.4⅛	.03⅛	.05⅛	.03⅝	04	.03⅝			07⅛	.04	08	.05	35,800
San Juan Star	Colo.	1	.28⅛	.28⅛	38⅛		.29⅜	.29			.30⅛	.29⅝	31	30	9,000
Savage	Nev.	2½	.28		3	.28	35	30			.39				100
Sierra Nevada	Nev.	3	90		1.20	.90	1.25	1 10							
Small Hopes	Colo.	20	1.25		1.4		1 40				1 40				1,000
Standard Con.	Cal.	100	2 40		2 60	2 40	3 00	2 80			2 80				900
Syndicate	"	100	10		.13		14								1,300
Union	Colo.	1	23		23		.24				21	.22	.23⅛	.22⅝	8,400
Union Con.	Nev.	2½	0		.50		.2	2							
Utah Con.	"	3	.25	.18	18		25				35				1,000
Vindicator	Colo	1													
Waldorf	Colo	1	.03⅛		.03¼		03⅛								
Work	Colo	1	.18⅛		.18⅛	17	18				22	.20⅝			10,600
Yellow Jacket	Nev.	3	38		3		45								1,200

COAL AND INDUSTRIAL STOCKS.

Name of Company.	Location.	Par val.	Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22.* H.	Feb. 22.* L.	Feb. 23. H.	Feb. 23. L.	Feb. 24. H.	Feb. 24. L.	Sales
American Coal	Md.	$25				140		140				140			
Am.S.&W Con		100	49⅛	48⅝	49⅜	48¼	51⅛	49			51⅜	52	59⅛		42,596
" " pf'r'd		100	94	93⅛	94	93⅝	95⅛	94			97	95	99⅛		32,295
Central of N. J.	N. J.	100	05	104⅞	105	104⅛	109⅛	104⅞			112	109⅛	110⅛		42,222
Col. C.& I. Dev.	Colo.	100	.⅛		1⅛		1⅛	1			1⅛				
Col. Fuel & I.	"	100	34⅛	34⅛	34	34	34⅛	33¾			34⅛	33⅛	34		4,475
Col. & H.C.& I.	Ohio	100	7⅛	6⅛	7⅛		7				7⅛	7			110
Con. Coal	Md.	100			51		52					52			
Del. & Hud.	N. Y.	100	114	113⅛	114	113¼	116	113⅜			114⅜	113⅛	113		11,777
Ed'n E.I. of N.Y	"	100			195¾		196½				196¾	195⅛	196¾		1,084
Federal Steel		100	52	51¾	51⅛	51	52	51⅛			52	50⅝	51⅛		105,40
" " pf		100	88⅛	87¾	89	88⅛	88¾	87¾			88⅛	87⅛	88⅛		47,586
Maryland C.pf.	Md.	100	58	52	58	53	58	52			58	52			
National Lead.	N. Y.	100	36⅛	35¾	37	36⅛	36⅞	36			36⅞	36⅛	36⅛		7,215
New Central C.	Md.	100	43	38	43	38	43	38			43	38			
N. Y., Ont. & W.	N. Y.	100	22⅞	22⅝	23	22⅜	24⅜	22⅜			24¼	23⅝	24⅛		125,96
Penns'lv'nia C.	Pa.	100		360		360		365				365			
Phila. & Read	"	100	23¾	22⅝	23	22⅜	23¼	22¼			23⅛	22⅝	23		19,418
" " 1st pf.	"	100	64⅛	63⅝	64⅞	64	65⅛	63⅞			66⅜	64¼	64⅛		161,53
Standard Oil		100	474	473	480	478	483	48			490	488			
Tenn.C.,I.&R.R.	Ala.	100	43⅛	43	44¾	43⅛	45⅛	44⅜			46⅛	44¾	45¾		30,20

* Holiday. ‖ Ex-dividend

PHILADELPHIA, PA.

Name of Company.	L'cation.	Par Val.	Feb. 17. H.	Feb. 17. L.	Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22.* H.	Feb. 22.* L.	Feb. 23. H.	Feb. 23. L.	Sales
Cambria Iron.	Pa.	$50	45 50	45 25	45.50	45.00							45 75	45 50	181
Cambria Steel	"	50	16 63	16.38	16.75	16.38	17.88	16 75					19 5	18 63	25 502
Choctaw, pref.	I. T.	50	46 75	46 50			45 75	45 50					46.50	46 00	1 180
Choc. Tr. ctf	"	50	36.00	35.75			36 00						36 00	35 75	3,319
Hunt & B T.pf	Pa.	100											42.00	41 88	556
Lehigh Val	"	50	26 38	25 75			26 25	26 00					26 50	26.25	1,215
Penna. R. R	"	50	68 00	67 13	68.25	67.75	68.25	67 88					67.88	67 25	27,466
Penna Salt	"	50													
Penna. Steel.	"	100					32.0	31.00					35 00	32 50	1,692
" pr'f	"	100					50 00						55 00		114
United Gas I.	"	50	144⅜	144	146	144	146¾	145					147¾	146	15,732
Welsb. of Can	Can.	100	3 00		2.75								2 50		600
Welsb. C'ml	"	100					16.70								15
Welsb. Light	"	100	38.50	37.00	39.00	38 50	38 5	38.50					38 5		785

Total shares sold, 78,357. * Holiday.

BALTIMORE, MD.‡ Feb. 23.

Name of Company.	Location.	Par value	Bid.	Ask	Name of Company.	Location.	Par value.	Bid.	Ask
Atlantic Coal	Md.	$10			Howard C.&C	Md.	$5		
Big Vein Coal	"	10			Newburg Orrel C.	"	25		
Consolidation Coal	"	100	55	58	Silver Valley	N. C.	5		
George's Creek Coal.	"	100	110	115					

ST. LOUIS, MO. Feb. 22.

Name of Company.	Location.	Par value.	Latest Bid.	Latest Ask.	Sales.	Name of Company.	Location.	Par value.	Latest Bid.	Latest Ask	Sales.
Am. Gold.	Colo.	$10				Granite B.	Mont.	$10	$1 3	$1 47⅛	1,100
Am Nettie	Colo.	10	$1.00	$1 15		Hope St. L.	Mont.	10			
Central L.	Mo.	100	90 00		10	St. Joe. L.	Mo.	10	13 00	14 25	
Doe Run L.	Mo.	100	27 50			Sm. Hopes.	Colo	20			

BOSTON, MASS.†

Name of Company.	Par val.	No. of shares.	Feb. 17. H.	Feb. 17. L.	Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22.* H.	Feb. 22.* L.	Feb. 23. H.	Feb. 23. L.	Sales
Aetna, cons. g.	$5	100,000							4.00				4 00		2,000
Adven'u'e.Cons	25	100,000	15.00	14 88	15.00	14 88	15 50	15 00	17 00	15 0			18 13	16 00	10,493
Allouez, c.	25	80,000	10 25	10.00	10.50	10 00	13 50	11 00	13 00	11 25			12 00	11 00	18,374
Arcadian, c	25	100,000	78 00	75 00	79 00	78.0	79.75	7.00	77 5	74 50			77 50	75 00	0,760
Arnold, c.	25	40,000	11.50	10 00	10 75	0.25	10.50	8 00	10 00	9 0			10.00	9 00	7,155
Ashbed, c.	25	40,000			2.25		2 00		2 25	2 00			2 00		1,195
Atlantic, c.	25	40,000	41 50	40 0	42 00	41 0	42 50	41.00	42.50	41 00			42 00	40 75	1,941
Baltic, c.	25	100,000	36.00	32 00	36.00	35.00	35.00	34 0	35 00	33 75			35 00	33 50	4,432
Bonanza, g.	10	300,000			1 63	1.50	2.00	1 63	2.38	2 13			2 50	2 38	6,525
Bost.&Mont,gsc	25	150,000	376⅛	374	376	375	377	372	372	358			372	368	4,730
Breece, s g	25	200,000	1 88	1.63	2.00	1 88	1.88		1 88				2 13	1.88	5,400
Butte & Bost., c	10	200,000	97.00	92 50	94.50	92.50	91.50	92.00	93 00	91 50			91 25	89 00	5,145
Cal. & Hecla, c.	25	100,000	790		815	805	890	815	895	890			850	§840	1,104
Catalpa, s	10	300,000	.40	.35	.50	.40	.60	55	.60				60	.55	17,035
Centennial, c.	25	80,000	50.50	48.50	51.25	50.00	50 25	50 00	50 25	49 50			53 50	49 50	16 136
Cochiti, g	10	150,000	11.00	10.75	11.00	10.50	11 00	10.50	10 75				10 50		3,135
Crescent, s.	10	300,000					.32	.25	.40	.29			50	.35	19,900
Dominion Coal	100	150,000	34.25	34.00	34.25		34.50	34.00	34 25	34.00			35 75	34 50	4,150
do. pref.	100	30,000	116				1.6⅛		116⅛	16					105
Dunkin, s	25	200,000	39		38	35	.38		37⅛				.45		1,300
Federal Steel.	100		52 13	51 00	51 75	51 25	51 63	51 13	51 50	51.25			52 00	51 75	9,166
do. pref	100		88.38	88 00	88.50	87 88	89 0	88.00	89 0	88 50			88 75	87 88	5,737
Franklin, c	25	40,000	28 00	27 75	28.50	27 75	29.50	28.25	29.50	28 00			29.00	28 50	6,034
Gold Coin.	5	200,000							.75	50					1,125
Humboldt, c.	25	40,000	3.00	2.75	3 00		3.0		3.05				3 00	2 75	1,150
I. Royal Con. c.	25	100,000	60.50	57 7	62 0	59 0	61.2	60.00	67 00	61.00			64 50	63 25	18,865
Merced g.	15	100,000			8 50		9.00		11 50	9 00			12 00	11 5	5,240
Mohawk, c	25	100,000	31 00	30 50	31.0		34.00	31.13	35 00	33 63			37 0	34.50	31,135
Napa q	7	100,000					9.00	8 50							500
New Idria, q.	5	100,000	10.25	10.00			0 75		11 00	10 50			11 00		1,200
N. A. Gold Dre'g	0	100,000	37 00	31 00	40.00	37.00	43.0	40. 0	42.50	42.0			40 50	40 00	14,951
Old Colony, c	25	100,000	21 50	19 50	21.00	20.00	2 00	20.75	21 75	20 00			21 50	20.50	22,0 6
Old Dominion,c	25	150,000	48.50	42 00	49.00	47 00	49.0	47.00	46.0	44.00			45 0	44 0	63 201
Osceola, c.	25	100,000	04	94 50	05	103	105	103	104⅛	102			102	100	9,557
Parrot, s c	10	230,000	43 00	41.50	43.00	42.00	47 88	43 0	50 00	47 5			60 50	50 00	15,397
Pioneer, g.	10	100,000	7 13	6 75	7 00	6.75	7 25	7.00	7 25	7 00			7 25	7.00	5,806
Quincy, c	25	100,000	80	175	180		184	180	186	184			185	182⅛	1,483
Rhode Isla'd Mg	25	100,000	12 0	11 25	12 00	11 50	12 0	11.25	12 0	11 75			13 13	10 75	13,2 8
San. Ysabel, g.	5	100,000	15 63	15.50	16.00	15 5	15.50	14.75	15 0	14 0			14 50	14 00	3,850
Tamarack, c.	25	60,000	245	242	250	245	250	244	265	250			265	260	2,070
Tecumseh, c.	25	40,000	9 25		9.75	9 25	10 00	9 50	10 25	10 00			10 60	9 75	2,142
U C L. & Mg. Co	2		10 50	0 25	10 50	10 00	10 50	10.00	10.00				10.75	10.00	2,455
Utah Cons g &c	5	300,000	49 0	45 13	49.0	48.0	49 25	47 50	48 25	45 50			48 00	45 00	19 131
Victor, g.	5	200,000	4 00	3 5	3 50										335
Washington Mg	25	40,000	3 88	3 50	4 00	3.88	4 50	4 00	4 00	3 88			4 00	3 50	13,225
Winona, c.	25	100,000	6 50	15 75	17 50	16 50	20.0	17 50	22 00	17 00			22 00	21 25	27,331
Wolverine, c	25	60,000	49 5	48 50	49 75	49 00	50.0	49 00	50 0	49 25			50 00	44 00	7,175

† Official quotations Boston Stock Exchange. Total shares sold, 433,617. *Holiday. § Ex-dividend.

CLEVELAND, O. Feb. 22.

Name of Co.	Iron Range	Par Val.	Feb. 22. Bid.	Feb. 22. Ask.	Name of Co.	Iron Range.	Par Val.	Feb. 22. Bid	Feb. 22. Ask.
Aurora.	Gogebic.	$25	$15	$4	Jackson	Marquette.	$25		
Champion		25		25	Lake Superior.	"	25	$ 5	$40
Chandler	Vermillion.	25	5'	60	Minnesota	Verm. & Mes	100	91	92
Cleve'd-Clfs.	Marquette.	100	65	66	Pitts & L'keAng	Marquette.	25	115	125
Fed. Steel Co.		100	29⅛	30	Republic.	"	25	15⅛	16

BUTTE, MONT.* Feb. 10.

Name.	Location.	Par Val	Quotati'ns. Bid.	Quotati'ns. Ask.	Sales.	Name.	Location.	Par Val	Quotati'ns. Bid.	Quotati'ns. Ask.	Sales
Alice g	Mont.	$25	$0.00	$0.70		Lone Pine C., g	Wash	$1		$0 35	
Am. Dev. & M.	"	5	.10	.20		Mont. Ore P.	Mont.	25		150.00	
Anaconda, g	"	2		50.00		Morn. Glory, g	Wash	0		16	
Hope (Basin).	"		.50	1.00		Mountain L.	"	0.10		.81	
Black Tail, g.	Wash			18		New South Cr's	Mont		$5.05	25	
Con. Gran.-Bim.	Mont.		1.5			Number Six, g.	Wash	0 0		10	
Con. Tiger-Poor.	Idaho	1	.30	.40		Rebate, g.	"	1		24	
Gold Mn. (Ruby)	Mont.		30	.50		Republic G.	"	1	2 75	3 00	
Iron Mn., g.			.08	.15		San Poil, g	"	1		77	
Jim Blaine, g	Wash			.45		Tom Thumb, g	"	1	2	3	

* Specially reported by the Hewett-Sisley Company. Total sales 19,310 shares

COLORADO SPRINGS, COLO.‡

Name of Company.	Par val	Feb. 13. B.	Feb. 13. A.	Feb. 14. B.	Feb. 14. A.	Feb. 15. B.	Feb. 15. A.	Feb. 16. B.	Feb. 16. A.	Feb. 17. B.	Feb. 17. A.	Feb. 18. B.	Feb. 18. A.	Sales
Alamo	$1	06⅝	.06⅝			.06¼		05¼	06⅜	06¼		.06⅜		5,000
Anaconda	1		52					55⅛	56	56¼	.57			3,000
Arg'ntum J	1		35	34	35	34	35					34⅛		5,000
C. O. D	1			5 05	5.00			5 50	6 00					6,000
C. C. Con.	1	.10⅛	.10⅝					10⅛		10¼				6,300
Croesus	1	.007					005					005⅛		23,000
Currency	1	05	.05¼	05			05	14¾						50,500
Dante	1						12¼	12¾	13⅛	12				15,000
Des Moines	1													
Elkton Con	1	1 11	1 18	1 10⅛	1 13	1 09¼	1 10	1 09⅛	1 11⅛	1 04	1 9¼	1 04	1 05	122,370
El Paso G.	1	20⅜	.20⅛	.19	.19⅛	18	.19	.18	18⅛	18¼	18⅝	18⅛	.18⅞	36,708
Fanny R.	1													
Favorite	1	05⅞	06	.05⅜	.05⅞	05⅜	.05⅛	04⅜	.04⅜	.04¾		04⅞	05	134,250
Findley	1	21	22	20⅛	.20⅜	19	.20	20	21¼	19	.20	.19¼	20	36,500
Gold & Gl.	1													
Golden Fl.	1							.39		36	.50	38		700
Ing. Con	1	.07⅛		.09⅛		08⅞	.09¼	.08⅛				08¼	08¾	12,500
Isabella	1	1 24⅛	1 36⅛	1 20	1 26	1 27⅛	1.35	1 20⅛	1 30	1 17	1 24	08⅛	1 16	299 775
Jack Pot	1		.47⅛	43	45	42⅛	.43	.41¾	42½	42⅛	.44	40	41	25,600
Lexington	1			07		07								7,500
Ma'net R.	1	03⅛	04	03⅝		0.3⅜	.03⅝	.03⅛		03⅛	03¾	03¼	.03⅜	29,000
Marion	1	06	.06⅛					.06						13,000
Matoa	1	42	.43¼	40⅛	.43	40⅛	.41⅜			38⅛	.41	.38½	39	30 400
Mobile	1	05	.05½	04⅞	.05		05	05¼		.04⅛		.05	05⅛	91,500
Mollie Gib.	1			28	.29	26	29	25⅛	26⅛					7,500
Moon-A'c'r	1	1 13	1 20	1 14	1 15	1 13	1 15	1 14		1 12	1 14			7,000
Mt. Rosa	1													
New Haven	1		02¾	02⅛			0.2⅝	.02⅝		02⅛				13,000
Oriole	1	02⅛	.02⅝	02	.02½		.02			02	02¼	01⅞	.02	42,000
Pharmacist	1													
Pilgrim C.	1	06¾	07	.06			06			07¾				29,500
Pinnacle	1	.09¾	10⅛	08⅞	09⅛	07	08	.07⅜	08⅛	07⅛	.08⅝			58,700
Portland	1	1 87		1.8	1 88	1 87	1.88	.87⅛	1 88¼	1.82	1 87	85	1 87	14 000
Prince Alb.	1	04	.05	05	05⅛	.04⅞	.05	05	.05⅛	05	.05⅛	04⅜	05	205,267
Princess	1		04	03¾			03⅛					03⅜	03⅝	32,000
Specimen	1		11	10½	.11	10½	10⅞	10⅝		10	0⅛	09⅛	09¾	31,000
Trachyte	1	04¾	05	04⅛	05	04⅞	.04½	.05⅛	05⅛	.0	05⅛	.04⅛	05¼	82 300
Union	1	2.⅛	.23⅛	.22	22¾	22¾	22⅝	.22	22⅛	22¾	22⅛	21⅛	21⅛	30,950
Vindicator	1											97		500
Work	1	20	.20⅞	.20	.21	.19⅞	20¾	.19⅛	19¾	.18	19⅜	18	.18⅛	188,450

‡ Official quotations Colo. Springs Mining Stock Exchange. Sales: Listed stocks, 1,751,950; unlisted, 2,400,933; total, 4,152,883 shares.

By Telegraph.

Name of Company	Par Val	No. of Shares.	Feb. 20. B	Feb. 20. A	Feb. 21. B	Feb. 21. A	Feb. 22.* B.	Feb. 22.* A	Feb. 23. B.	Feb. 23. A
Alamo	$1	125,000	06⅛	.06⅛	.06⅝	06⅜			06⅜	06⅝
Anchoria-Leland	1	600,000	91⅛	.97	95⅛	1 00			97	1 00
Elkton Con	1	1,250,000	1 05	1 06	1 05⅝	1 06			1 04⅛	1.05⅜
Gold Coin, Vict	1	1,000,000	1.81	1 85	1.80	1 85			1 83	1 87
Golden Fleece	1	600,000	.35	40	.35	44			37	.38
Isabella	1	2,250,000	1.17	1.17¼	1 27	1.27½			1.16	1 16⅛
Moon-Anchor	1	600,000	1 21⅛	1.21⅛	1 19	1 19½			1 20	1 22
Mt. Rosa	1	1,000,000	.30½	31	.30	31			.27½	30
Portland	1	3,000,000	1 90	1.91	1 80	1 90			1 80	1.90

* Holiday.

STOCK QUOTATIONS.

DENVER, COLO.‡

NAME OF COMPANY.	Par val.	Feb. 13. B.	Feb. 13. A.	Feb. 14. B.	Feb. 14. A.	Feb. 15. B.	Feb. 15. A.	Feb. 16 B.	Feb. 16 A.	Feb. 17 B.	Feb. 17 A.	Feb. 18. B.	Feb. 18. A.	Sales.
Mines:														
Anac'da G.	$5	.52	.54	.53½	.54⅛	56	.57	57	.58⅜	.54	57	......	.57	3,500
Arg. J.	1	34	35	.33	34½	.33¼	36	.33½	.....	.34	36	......	.....	100
Bankers	1	.....	12	11⅝	.11⅛	11⅝	.12⅛	11¾	.12	......	.11⅝	..	.10⅝	9,0 0
Big Six	1	....	....	15	.	12	20		.....	......	......	....	......	5,000
C. C. Con.	1	.....	11½	.....	10⅛		10⅛	.10	10⅛		......	....	......	3,500
Elkton Con.	1	1.1 ⅜	1.14	1.10	....	1 08	1 13	....	..	1 05	1 06	1 02	1 08	....
Findley.	1	.....	23	......	....	19⅛	.21½	......	.2 ⅜	.19⅜	20¼	18	.20	......
Garf. Con.	1	.		14	15	14	.15⅛	13¼	.14	12⅛	......	.....	.. ..	1,000
Gold Eagle	1	40	....	45	..	39	...	.45	.50	41		..	... ..	1,000
Gold Fleece	1	.26		...		..	.....	36	.45	35	38	....	.....	[illegible]
Indepnd'nc	1	57½	58	56	57	.56	.	.56	.58	.56¾	.57½	56⅛	57⅛	2,100
Iron Clad.	1	.03⅛	.03⅞	03⅜	03⅝	03⅜	.03⅝	03⅛	.03⅝	.03	03½	03⅛	03⅜	11,000
Isabella	1	1 25	1.29½	1 31	1 32	1.28½	1 30	1 20	1 21½	1 16	1.17	1 05	1 08	5,600
Jack Pot	1	41	47		45¾	.....	.45	....	...	.40	43	.....	.....	....
Jefferson.	1	.06⅜	.08	06½	.08	.07	.08	06⅛	.....	......	...	.....	.....	4,000
Keystone	1	......	...	...		..	....	08	...	08⅛	.....	.09	.10⅜	..
LosAngeles	1	.09⅞	.....	.10½	11	...	....	.12⅜	.12⅝	.1	.11⅛	09⅞	11¼	16,000
Matoa	1	40	44	42	.44		.....	....	.....	.39		.38	41	1,000
Mollie Gib.	5	.....	.	27½	30	.25	27½		. .	.24½	27	23⅛	....	...
Moon-A.	1	1 15	1 17	..		.1	1 13	....	....	1.11	1.12½	1 13	...	200
NewZealand	1	...	25⅛	.....	22	.21	.26	.21	.30			.21	26	1,000
Ophir	1	.29	35	.24	28	.22	28⅛	.25	27	24	26	24⅛	.25	500
Pharmacist	1	.05¼	.05¾		.....			05½	07½	05⅜	05⅞	05¼	.05⅝	.....
Portland.	1	1 80					.88		....		....	1 80	1.89	....
Pr. Albert.	1	04⅝	04⅞	04⅝	04¾	04⅞	.05⅛	05¼	05⅝	.04¾	.05⅛	.04¾	.04⅞	24,000
Sacram'nto	1	05⅛	05⅜			.....	....	.05½	07⅛	05⅜	05⅞	.05¼	.05⅝	....
Specimen.	1	.10⅛		.09	1 ½	.10	15	....		09¾	....			..
Union Gold	1	.21½	22⅜	.22⅛	22⅞	.22⅛	22¾	.22	.23⅛	22	22⅝	22		6,500
Va. M.	1	.04¼	.04½	.04⅛	.04½	04	.04⅛	.04	...	03⅞	04⅛	.03⅞	.04⅛	2,000
Work	1	.20⅛	21	20⅛	21½	19⅜	......	....	...	..	...	..		... ..
Prosp'cts:														
Ben Hur.	1	.05	05½				......	05¾	06⅛	05⅝	06	05⅛	....	2,000
C C Imp.	1	.003⅛		003½	.004	.004	004⅛	.004	.004½	004	...	.004¼	.	157,000
Gene Field	1	002⅛	.003	.002⅛	.....	002⅝	....	....	.....	.....	..	.....		17,000
GregoryLsg	1		..	.008	.009		....		...		...	.008	009	12,000
Illinois	1	.005⅝	....	005½	...	005½	...	005¾	.....	005	....	004	.006	.....
New Haven	1	02⅛	02½			...		02⅛	.		....	.02⅜	.....	......
Old Gold.	1	011		01½	011	012	013	.01⅛	01⅝	01⅛	....	.012		163,000
Pilgrim	1	005½	006		005⅜	005⅛	006	.005⅛	006	005⅛	......	005	005⅛	53,000
Pine Creek.		.005½	006⅛	005	006	.005	005¼	..	....	...		005	.006	17,000
Puritan	1		005½	.005⅛	005⅛	005⅛	006	005⅛	.005⅛	005¼	.005⅛	005¼	008	75,5 0
Reno	1	02¼	.....	.003¾	...	02⅜	0.½	.02¼	.02⅛	02½	02¾	.02⅛	00¾	5,000
Tamarack.	1	.008	01	008		.008		008⅛	008¾	...	...	.008⅛	08¾	10,000

‡Official Quotations Denver Stock Exchange. Sales: Mines, 97,50 shares; Prospects, 511,5 0 shares; grand total, 6 9,0 0 shares.

SAN FRANCISCO, CAL.‖

NAME OF COMPANY.	Location.	Par. value.	Feb. 17.	Feb. 18	Feb 20.	Feb 21	Feb 22 *	Feb 23.
Alpha Con.	Nev.	1.00	.08	...	.10	.....	......	.15
Alta	"	2 00	.10	09	.14	......	...	.10
Andes	"	3 00	.23	22	24	......	......	19
Belcher	"	3 00	.28	.28	33	...	......	.23
Best & Belcher	"	3 00	68	71	.73	....	......	.56
Bullion	"	1 00	.07	07	09	......	......	.06
Caledonia	"	3 00	39	.44	45	...	....	.40
Challenge Con	"	3 00	....	31	.32	......	......	.25
Chollar	"	3 00	.45	44	.47	......	......	.38
Confidence	"	3 00	77	.85	......	......	......	.73
Con. California & Virginia	"	2 50	2.30	2 25	2 40	......	....	1 90
Cons. Imperial	"	1 00	....	....	.02	.....	.	.01
Cons. New York	"	1.00	.....	......	.....	......	......	....
Crown Point	"	3 00	.27	.28	.31	......	......	.25
Exchequer	"	1.00	.....	......	03	......	..	....
Gould & Curry	"	3 00	.54	52	53	......	....	.40
Hale & Norcross	"	3 00	86	.36	.39	....	...	.40
Julia Con	"	1 00	.03	.03	.05	....	......	....
Justice	"	2.00	.29	.21	.26	....	....	.20
Kentuck Con	"	1.00	.10	.14	.15	....	....	.11
Mexican	"	3.00	82	.81	83	....	......	65
Occidental Con	"	3.00	.31	.83	40	....	....	30
Ophir	"	3 00	1 30	1.30	1.55	......	.....	1.05
Overman	"	2.00	11	.12	.18	....	....	.11
Potosi	"	3 00	34	.34	.38	......	....	.29
Savage	"	2 50	.34	35	.36	......	......	.31
Scorpion	"	1.00	05	.05	....	....	....	....
Sierra Nevada	"	3.00	1.15	1.30	1 35	....	....	1 20
Silver Hill	"	1 00	.....	....	.04	......	.....	....
Standard	Cal.	100	2.75	2.75	3.00	......	.	3 20
Union Con	Nev.	2.50	.64	.65	.68	....	....	.54
Utah Con	"	1 00	.29	.27	30	...	....	.22
Yellow Jacket	"	3.00	34	.39	37	......	....	.31

Official telegraphic quotations, San Francisco Stock Exchange. * Holiday.

ROSSLAND, BRITISH COLUMBIA.* Feb. 16.

NAME OF COMPANY.	No. of shares.	Par value	Selling price.	NAME OF COMPANY.	No. of shares.	Par value	Selling price.
Brandon & Gold. Cr.	1,500,000	$1	$0 3	Lerwick	500,000	$1	
Brit. Amer. Corp'at'n	7,500,000	5	4.00	Lily May	1,000,000	1	$0.15
Brit.Col. Corporation	1,500,000	2½	......	Lon.&Van.Fin.Dev.Co	500,000	5	
Canadian Gold Fields	10,000,000	0 10	.10	London B. C. Gold F.	250,000	5	8 00
Cariboo	1,500,000	1	1.50	Monte Cristo	1,000,000	1	....
Commander	500,000	1	......	New Gold Fields, B.C.	250,000	1	5.00
Deer Park	1,000,000	1	15	Novelty	1,000,000	1	05
Dundee	1,000,000	1	40	Queen Bess Prop.	120,000	5	3.75
Evening Star	1,000,000	1	10	Rambler Con.	1,000,000	1	33
Fern	200,000	¼	75	Reco	1,200,000	1	1 25
Gold Fields of B.C.	3,000,000	3⅞	4 50	Red Mt.View	1,000,000	1	....
Hall Mines	250,0 0	5	3 75	St. Elmo.	1,000,000	1	....
Hattie Brown	1,000,000	1	......	St. Paul	1,000,000	1	...
Homestake	1,000,000	1	.06	Sarah Lee	1,000,000	1	.23
Iron Colt	1,000,000	1	....	Silver Queen	1,500,000	1	12
Iron Horse	1,000,000	1	....	Slocan Star.	500,000	1	1 50
Iron Mask	500,000	1	.95	Vic Tr. MinesDev. Co.	25,000	5	....
Josie	700,000	1	......	Virginia	500,000	1	05
Jumbo	500,000	1	.....	War Eagle Con	2,000,000	1	3.10
Kenneth	1,000,000	1	.25	Waverly Mines	100,000	5	......
Keystone	1,500,000	1	.25	White Bear.	2,000,000	1	....
KootenayGold Fields	20,000	5	....	Wild Horse	400 000	1	......

* From Our Special Correspondent.

VALPARAISO, CHILE.* Jan 14.

NAME OF COMPANY.	Location.	Capital paid.	Sh.Val. paid up.	Last Div'nd. Amt.	Last Div'nd. Date.	Prices. Bid.	Prices. Asked.	Prices. Last sale
Arturo Prat, silver	Chile	$3,300,000	$100	4 p. c.	1897	16⅛	17	17
Caracoles, silver	"	315,000	100	10 "	1894	......	......	....
Huantajaya (mine) silver	"	1,000,000	100	13 "	1894	......	....	....
Huanchaca, silver	Bolivia,	8,000,000	25	4 "	1895	30	32	28
Oruro, silver	Chile	800,000	200	....	.....	310	320	310
Todos Santos, silver	"	2,000,000	100	1 "	1895	7	10	7
Agua Santa nitrate	"	3,000,000	50	5 "	1898	175	180	175
Antofagasta, nitrate	"	2,000,000	200	2 "	1898	160	161	162
Soc. Internacional, nitrate	"	930,000	60	......	...	...	.....	.....
Union, nitrate	"	3,000,000	200	......	....	46	48	50

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

SALT LAKE CITY, UTAH.* Feb. 18

STOCKS.†	No. of shares	Par val.	Bid.	Asked.	STOCKS.†	No of shares	Par val.	Bid.	Asked
Ajax	300,000	$10	$1.45	$1.47½	Homestake	400,000	$1	$0.10	$0.11
Alice	400,000	25	77½	.90	Horn Silver.	400,000	25	1 50	1.75
Anchor	150,000	10	75	1 25	Little Pittsburg	400,000	5	13¼	14
Buckeye	500.000	1	.04½	05⅛	Lower Mammoth	150,000	1	99	99¼
Bullion-Beck & Ch.	100,000	10	5 05	6 00	Mammoth	400,000	5	2 10	2 12½
Centennial Eureka	30,000	50	39 00	42 00	Mercur	200.000	25	6 22½	6 27½
Chloride Point.	500,000	1	1 07½	1 25	Northern Light.	400,000	5	77½	78⅛
Daisy	500,000	3	49½	.52	Omaha	300,000	2	40	.45
Dalton	500,000	5	08	08⅛	Ontario	150,000	100	7.50	8 10
Dalton & Lark	2,500,000	1	10⅛	10⅜	Richmond-An.	500,000	1	.7	.08
Daly	150,000	20	1.20	1.25	Sacramento	1,000,000	5	45	46
Daly West.	75,000	20	9 60	10 00	Silver King.	150,000	20	32 00	40.00
‖Dexter	200,000	5	2.85	3 10	Star Consolidat'd	500,000	1	1.17½	1.22½
Eagle	150,000	1	.11	.15	Sunbeam	250,000	1	.41½	.43
Eagle & Blue Bell.	250,000	1	2.01	2.02½	Sunshine	250,000	10	55⅛	56½
Emerald	300,000	1	12½	.17	Swansea	100,000	5	3 45	3 67½
Four Aces	250,000	1	56½	.56½	South Swansea.	150,000	1	1 20½	1.22
Galena	100,000	10	.55	.56	Tetro	300,000	1	07½	08¼
Geyser-Marion	300,000	5	.86	91½	Utah	100,000	1	70	1 00
Grand Central	250,000	1	6 67½	7.25	Valeo	200,000	10	1 35	1.42½

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

SPOKANE WASH.§ Feb. 23.

Name.	No. of shares.	Par value.	Quotations.	Name.	No. of shares.	Par value.	Quotations.
Ben Hur	600,000	$1	$0.3 ½	* Number Six	1,000,000	$0 10	$0.12
Black Tail	1,000,000	1	.22	Palo Alto	1,000,000	1	14½
Bryan & Sewall	1,000,000	1	05	*Pearl	1,000,000	1	13¾
Butte & Boston	1,000,000	1	.15¾	Pocahontas	1,000,000	1	04
Eardnar	1,000,000	1	.13	Princess Maud	1,000,000	1	16
Eureka First Thoug't	1,000,000	1	.05	Quilp	1,000,000	1	.15¾
Eureka Queen.	1 000,000	1	.08	*Rebate	1,000,000	1	22
Gold Harvest Con	1,000,000	1	05	Republic Gold	1,000,000	1	3.65
Gold Leaf	1,000,000	1	05	Republic Big Six.	1,250,000	1	08½
Iron Monitor	1,000,000	1	12	Republic No 2	1,000,000	1	16
*Jim Blaine	1,000,000	1	57	San Poil.	500,000	1	.80
Liberty	1,000,000	1	.14	*Surprise	1,000 000	1	.1
*Lone Pine Con	1,000,000	1	42½	Thoughtful	1,000,000	0 10	.08
Merrimac	1,000,000	0 1	09¾	Tom Thumb.	1,000,000	1	34
Monroe	1,000,000	1	03	Trade Dollar	1,000,000	0.10	12
Morning Glory	1,000,000	0 10	.23	Treasury	1,000,000	0 10	.05
Mountain Lyon	1,000,000	1	.85	......		...	....

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

TORONTO, CAN.*

NAME OF COMPANY.	Par val.	Feb 17. B.	Feb 17. A.	Feb. 18. B.	Feb. 18. A.	Feb. 20. B.	Feb. 20. A.	Feb 21. B.	Feb 21. A.	*Feb. 22. B.	*Feb. 22. A.	Feb. 23. B.	Feb. 23. A.	Sales
Ontario:														
Ham. Reef.	$1	.43⅜	46½	.43	.47	......	......	.40	.45	.....	.....	.42½	.43½	2,700
Hiawatha	1	.24	.25	.24	.25	......	......	.24	25	...	.....	24	.25	2,500
Olive	1	97	.98	97	98	......	......	97	.98		....	......	......	......
Saw Bill	1	30	.33	.28	.35	......	......	.30	.35	...	......	25	.35	500
British Col.:														
Athabaska.	1	.53	.58	.54	60	......	......	.54	60	....	.	.52	56	1,300
C'riboo.	1	1.77	1.81	1.78	1.82	..	....	1 75	1.77½	....	..	1 64	1 70	200
CrowsN P.C	1	50 00	56 00	......	.	......	.....	56 00	......	.....	...	...	......	.....
Dardanell's	1	.17¼	.18	.17⅛	18	.	...	17⅛	.18⅛	.....	.	.17½	18	4,500
Deer Park.	1	.16⅛	.18	.16¾	.17½	...	..	09⅛	.10	......	...	09¼	10⅛	7,300
Dundee.	1	.32¼	.34	.32¾	.35	....	.....	.34	.38	.	......	.34⅛	35	1,2 0
Gold Star.	....	.67	.73	67⅜	68	....	.....	.69	73	.....	......	67⅜	.70	8,800
GrandPrize	1	.....		.....	03	.....	.....	......	......	.....	......	...	...	......
Iron Colt.	1	.11⅛	.13⅛	12	.15	......	......	11⅛	.16	.....	......	15	.18	500
Minnehaha	1	.31⅛	.32	26⅛	30	.....	.....	.28	.33⅛	.....	......	29	30	6,500
Monte Crist	1	.14⅛	.15	13⅛	15	.....	......	.13¾	15	....	......	13¾	.14	4,150
Montr'l G.F.	1	22	25	.21⅛	.23	.		.22⅛	25	.....	.....	21	23⅛	1,0 0
Noble Five.	1	.30¼	.33	30	.32	.....	.	30	32	.....	.....	30	32	1,500
N'rt'n Belle.	1	.02⅜	.03	.03	.03¼		.....	.03⅛	03¼	.....	....	.02⅛	03⅛	1,500
Rambler.	1	38	42	.38⅛	.42	......	.....	.41¼	47	...	...	.42	46	1 500
Sentinel	1	.....	......	.....	...	....	.....	.13⅛	16	.....	.....	12⅛	16	1,100
Silver Bell	1	......	04	03	06	.....	.....		06⅛	.....	.....	...		
Smuggler,g.	1	08⅛	.09	08⅛	09⅛	.....	.....	07¼	07	..	.....	.07¼	.09	500
Van Anda.	1	.....		.03⅛	05	.....	.....		.03⅛	.....	.....	.....	03¾	.....
Victory Tri.	1	10¼	.11⅛	.10¼	.10⅛	.....	.....	09¾	.11	.....	.....	08⅛	.10	500
Virginia.	1	.50⅛	53	.50⅛	.51	.....	....	50	55	..	....	50	.55	100
Waterloo	1	13¼	.14⅛	13⅛	14	.....	......	11¼	16	......	...	.14¼	15	1,500
White Bear.	1	.05¾	.06	.05⅛	06	.....	.....	05	06	.. ..	...	.03¾	.05⅛	7,000
Develop Co.														
B.C. Gold F.	1	06	.07	.06¼	.07⅛		....	06⅛	07	...	....	.06	07	150
Gold Hills	1	07	10	.07⅛	10		....	.08	08⅛	.. ..	.. ..	07⅛	10	2,000

* Official quotations of the Toronto Mining and Industrial Exchange. Total shares sold, 61,400. * Holiday.

MEXICO. Feb. 16.

NAME OF COMPANY.	No. of shares.	Last div'd.	Prices. Op'g	Prices. Cl'g.	NAME OF COMPANY.	No. of shares	Last div'd	Prices Op'g	Prices Cl'g
Chihuahua:					Hidalgo:				
Gloria	1,500	....	$60	$50	Real del Monte.	2,354	10 00	770	760
Durango:					San Francisco	6,000	2.00	27	260
Barradon y Cab	2,400	....	150	100	San Rafael y An	1,200	6 00	1,000	1,020
Candelaria de Pan.	1,200	....	20	20	do aviado	1,200	6 00	500	460
Capuzaya	2,400	....	10	50	do. del Oro.	3,000	......	15	1
Penoles	2,500	30.00	2,300	2,000	Soledad	960	5 00	37	350
Restauradora	10,000	....	20	30	Sorpresa	960	4 00	220	200
Rosario y Anexas.	4,800	......	20	10	Union.	2,000	4 00	370	400
Guanajuato:					Mexico				
Angustias	2,400	5.00	310	290	Coronas	500	....	75	75
Cinco Senores y An	2,000	15.00	310	285	Esperanza y An.	3,000	10 00	1,450	1,800
El Oro	500	.....	30	30	Michoacan				
do. pref.	2,000	....	30	30	Luz de Borda ava	3,000	....	28	40
Guadalupe	10,000	4 00	230	220	do aviado	1,000	....	15	20
Trinidad, aviador	2,000	...	10	9	Pueblo				
do. aviado.	400	......	90	80	Tlauzingo	2 400		40	27
Zona Minera de Paz	2,400	...	1,0	85	S. Luis Potosi				
Hidalgo:					Concep. y An.	2 4 0	.....	125	110
Amistad y Concord.	9,600	1.39	31	29	Sta.MariadelaPaz	2,400	10 00	700	715
Arevalo	720	......	200	200	Zacatecas:				
Bartolome de Med.	2,000	3.00	95	80	Asturiana y An	2,500	10.00	110	75
Carmen	1,100	7.75	50	520	Cabezon	2,400	....	20	15
Luz de Maravillas.	1,100	...	180	200	C'delar. de Pinos.	2,500	....	100	130
Pabellon	1,000	27.89	40	20	Palma de Somb.	2,400	......	110	100

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 $50 or $100. Prices are in Mexican dollars.

SHANGHAI, CHINA.* Jan. 16.

NAME OF COMPANY.	Country.	No. of shares.	Value. Par.	Value. Paid up.	Last dividend. Date.	Last dividend. Amount.	Price.
Jelebu Mg. & Trad.	China	45,000	$5	$5	Oct., 1894.	$0.25	Taels 2.85
Punjom Mg., Ltd.	"	60,000	8	5	....	....	" 4.38
do. pref	"	30,000	1	1	....	....	" 1.17
Raub A'lian G. Mg.	"	200,000	£1	14s. 10d.	July, 1898.	.51	" 33.76
Sheridan Con. M.& M.	Colorado, U.S	20,000	Taels 100	Taels 100	....	....	" 2.50

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

STOCK QUOTATIONS.

LONDON.

Feb. 10.

NAME OF COMPANY.	Country.	Author-ised capital.	Par value.	Last dividend. Amt.	Last dividend. Date.	Quotations. Buyers	Quotations. Sellers
			£ s. d.	s.d.		£ s. d.	£ s. d.
‡Alaska-Mexican, g...	Alaska	£200,000	1 0 0	0 4.8	Jan., 1899	17 6 1	2 6 0
‡Alaska-Treadwell, g...	"	1,000,000	5 0 0	1 6	" "	4 10 0	4 15 0
Anaconda, C., s...	Montana	6,000,000	5 0 0	5 1½	Nov., 1898	9 2 6	9 5 0
Cariboo, g f, pref....	BritishCol'mbia	150,000	1 5 0	.....	.....	15 0	1 0 0
Chispas, g., s., c.....	Mexico	252,500	1 0 0	.....	.....	5 0	7 0
Con. Gold Fields	"	300,000	1 0 0	.....	.....	15 0	1 0 0
De Lamar, g., s.....	Idaho	400,000	1 0 0	6	May, 1898	3 6	4 6
Elkhorn Priority (New), s	Colorado	87,500	1 0 0	1 0	June, 1898	1 3	3 9
Golden Gate, g.....	California	80,000	1 0 0	.....	.....	2 6	5 0
Grand Central, g., s	Mexico	300,000	1 0 0	2 0	Dec., 1898	1 7 6	1 10 0
Hall Mines, c., s.....	British Col...	250,000	1 0 0	1 0	May, 1898	10 0	12 6
Le Roi, g...	" "	1,000,000	1 0 0	.....	.....	5 12 6	5 15 0
Lillooet, F. R. & Car., g....	" "	300,000	1 0 0	.....	.....	5 0	10 0
Montana, g., s.....	Montana	660,000	1 0 0	0 3	May, 1898	7 0	7 6
Mountain Copper.....	California	1,250,000	5 0 0	2 6	Sept., 1898	7 5 0	7 10 0
Palmarejo & Mexican, g., s	Mexico	80,000	1 0 0	.....	.....	3 0	4 0
Plumas-Eureka, g...	California	281,250	2 0 0	0 6	Oct., 1896	2 6	3 6
Richmond, g., s., l.....	Nevada	270,000	5 0 0	1 0	Dec., "	6 0	7 6
Sierra Buttes, g.....	California	245,000	2 0 0	0 6	Apr., "	1 6	2 6
*Solomb. Hydraulic, g...	Colombia	25,000	1 0 0	6	Jan., 1899	8 9	11 3
Copiapo, c.....	Chile	200,000	2 0 0	2 0	Dec., 1898	3 7 6	3 10 0
Frontino & Bolivia, g. ...	Colombia	140,000	1 0 0	1 6	Dec., 1898	2 3 9	2 6 3
St. John del Rey, g.	Brazil	600,000	1 0 0	1 0	Jan., 1899	1 7 6	1 10 0
Tolima A., s., g.....	Colombia	70,000	5 0 0	5 0	July, 1897	1 5 0	1 15 0
Tolima B., s., g.....		30,000	5 0 0	5 0	"	15 0	1 5 0
UtahCon.,g(High'lndBoy)	Utah	300,000	1 0 0	1	Jan., 1899	7 7 6	7 12 6
British Am. Corp.	BritishCol mbia	1,250,000	1 0 0	rts.	Dec., 189	16 6	17 6
Linares, l	Spain	45,000	3 0 0	12 6	Sept., 1898	8 10 0	9 10 0
Mason & Barry, c., sul....	Portugal	630,000	3 0 0	4 0	Oct., 1898	3 17 6	4 2 6
Rio Tinto, c	Spain	1,625,000	5 0 0	£1	Nov., 1898	19 15	20 0 0
" " pref.....	"	1,625,000	5 0 0	2 6	May, 1898	6 3 9	6 6 3
Tharsis, c.....		1,250,000	2 0 0	0 1	"	8 17 6	9 10 0
‡Assoc. Gold Mines.....	W. Australia	5 0,000	1 0 0	2 0	Feb., 1899	6 2 6	6 5 0
Broken Hill Prop., s.....	N.S. Wales	384,000	8 0 0	1 6	Jan., 1899	2 8 9	2 11 3
Great Boulder, Prop	W. Australia	1,750,000	2 0 0	6	Feb., 1899	1 2 9	1 3 3
‡Hannan's Brownhill, g .	"	110,000	1 0 0	7 6	Feb., 1899	8 3	8 3 9
Harquahala	"	300,000	1 0 0	6	Nov., 1894		9
‡Ivanhoe Gold Corp.....	"	1,40 ,000	1 0 0	5 0	Feb., 1899	7 12 6	7 15 0
‡Kalgurlie, g	"	120,000	1 0 0	rts.	Feb., 1899	7 0 0	7 2 6
‡Lake View Consols, g ...	"	250,000	1 0 0	5 0	Feb., 1899	9 13 9	9 16 3
Mt. Lyell M. & R., l., c. ...	Tasmania	900,000	3 0 0	2 6	Jan , 1899	8 5	9 10 0
‡Mt Morgan, g.	Queensland	1,000,000	1 0 0	7	Feb., 1899	5 1 3	5 12 9
Waihi g	New Zealand	320,000	1 0 0	2 0	Dec., 1898	5 10 0	5 12 6
West Aust. Jt. Stk. Lin. & F	W. Australia	1,140,0 0	1	60 0 1 0		9 0	9 6
Champion Reef, g.....	Colar Fields	220,000	1	10 0	4	Jan., 1899	4 16 3	4 18 9
Mysore Gold, g.....	"	250,000	1	10 0	5 0	Nov., 1898	5 8 9	5 11 3
Nundydroog, g.	"	242,000		0 0	3 4	" 1898	3 6 3	3 8 9
*Ooregam, g	"	145,000	1	0 0	1 0	Dec., 1898	3 12 6	3 15 0
" pref. g.....	"	120,000	1	0 0	1 0	" 1898	4 8 9	4 11 3
Angelo, g	Transvaal	275,000	1	0 0	5 0	Jan., 1899	8 7 6	8 12 6
Bonanza, g.....	"	200,000	1	0 0	0 0	Dec , 1898	4 2 6	4 5 0
British S. Af., chartered	So. Africa	3,750,000	1	0 0	rts.	Jan., 1899	3 8 9	3 11 3
Cape Copper, c.....	"	600,000	1	0 0	7 0	Jan., 1899	4 2 6	4 7 6
" " pref	"	150,000	2	0 0	7 0	" 1899	5 15 0	6 0 0
City & Suburban (New), g	Transvaal	1,980,000	2	0 0	6 0	Feb , 1899	6 6 3	6 8 9
Con Deep Level, g	"	200,000	4	0 0	nb.	Apr., 1898	3 5 0	3 7 6
‖Crown Reef, g.	"	120,000	1	0 0	10 0	Feb., 1899	14 17 6	15 2 6
De Beers Con., d	Cape Colony	3,950,000	1	0 0	£1	Jan., 1899	29 16 3	29 18 9
Durban Roodepoort, g..	Transvaal	135,000	5	0 0	4	Dec. 1898	6 7 6	6 12 6
‡Ferreira, g.....	"	90,000	1	0 0	30 0	Feb., 1899	23 15 0	24 5 0
‡Geldenhuis Deep, g	"	350,00	1	0 0	9 0	Feb., 1899	11 5 0	11 10 0
‡Geldenhuis Est., g.....	"	200,000	1	0 0	7 6	" 1899	7 15 0	8 0 0
‡Ginsberg, g.....	"	160,000	1	0 0	4 0	Feb., 1899	3 8 9	3 11 3
‡Henry Nourse, g.....	"	125,000	1	0 0	10 0	Feb., 1899	8 17 6	9 2 6
Heriot (New), g.....	"	115,38	1	0 0	5 0	" 1899	7 5 0	7 0 0
Jagersfontein, d	Orange Fr. St.	900,000	1	0	6 0	Sept , 1898	12 7 6	12 2 6
Johannesburg Con. Invst	So. Africa	2,750,000	1	0 0	2 0	Aug., 1897	2 2 6	2 5 0
Jubilee, g.....	Transvaal	50,000	1	0 0	5 0	Feb., 1899	6 2 6	6 7 6
‡Jumpers, g.....	"	100,000	1	0 0	10 0	" 1899	5 15 0	6 0 0
*Kleinfontein, g.... ..	"	275,000	1	0 0	rts.	Apr., 1898	3 2 6	3 5 0
Langlaagte Estate, g....	"	500,000	1	0 0	3 0	Jan., 1899	4 2 6	4 4 0
Msy Con. (New), g. ...	"	275,000	1	0 0	1 6	Jan., 1899	4 6 3	4 18 9
Meyer & Charlton, g ..	"	85,000	1	0 0	7 0	Jan., 1899	6 3 9	6 11 3
Namaqua, c.....	Cape Colony	200,000	1	0 0	2 6	Dec., 1898	3 12 6	3 7 6
‡Primrose (New), g.....	Transvaal	300,000	2	0 0	6 0	Jan., 1899	5 0 0	5 2 6
Rand Mines, g.	So. Africa	400,000	1	0 0	£1	Feb., 1899	44 12 6	44 17 6
‡Robinson, g.....	Transvaal	2,750,000	1	0 0	9 0	" 1899	10 7 6	10 12 6
Sheba, g.....	"	1,100,0001	1	0 0	0 6	July, 1898	1 13 9	1 15 0
Sim. & Jack Prop., g.....	"	5,000,000	5	0 0	3 6	Jan., 1899	6 7 6	6 10 0
Sim. & Jack West, g.....	"	400,000	1	0 0	...	.....	4 7 6	4 10 0
Sim. & Jack East, g.....	"	70,000	1	0 0	...	.....	...	...
Wemmer, g.....	"	80,000	1	0 0	15 0	Nov., 1898	12 2 6	12 7 6
Wolhuter, g.....	"	880,000	4	0 0	2 0	Feb., 1899	6 10 0	6 12 6
Worcester, g.....	"	100,000	1	0 0	3 0	Feb., 1899	3 2 6	3 5 0

*Dividend pending. ‡Ex-dividend. ‖Ex-rights

PARIS.

Feb. 2.

NAME OF COMPANY.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Op'ning	Prices. Closing.
			Francs.	Fr.	Fr.	Fr.	Fr.
Acieries de Creusot.....	France	Steel mfrs..	27,000,000	2,000	75.00	2,165.00	2,075.00
" " Firming.....	"	" " ..	4,000,000	500	85.00	3,330.00	3,350.00
" " Fives-Lille..	"	" " ..	12,000,000	500	35.00	550.00	550.00
" " Huta-Bank..	Russia	Iron & steel	.....	500	.....	4,300.00	4,275.00
" " la Marine..	France	Steel mfrs..	20,000,00	500	40.00	1,555.00	1,565.00
" " Longwy..	"	" " ..	.....	500	35.00	1,115.00	1,160.00
Anzin.....	"	Coal.....	.....	.....	190.00	5,445.00	5,430.00
Blache-St. Vaast.....	"	Steel	.....	1,000	160.00	3,800.00	3,800.00
Boleo.....	Lower Cal.	Copper.....	.....	500	93.50	2,210.00	2,394.00
Briansk.....	Russia	Coal & Iron	.....	500	.....	1,342.50	1,350.00
Bruay.....	France	Coal.....	3,000,000	400	900.00	38,600.00	39,200.00
Cape Copper.....	S. Africa	Copper.....	15,000,000	50	1.50	96 00	1.85.50
Champ d'Or.....	"	Gold.....	3,375,000	25	.....	46.5	60.06
Courrieres.....	France	Coal.....	600,000	500	60.00	2,116 00	2,180.00
De Beers Consolidated..	S. Africa	Diamonds ..	98,750,00	125	15.63	723.00	763.00
Denain-Anzin.....	France	Steel.....	.....	500	20.00	8 5.00	820.00
Dombrowa	Russia	Coal.....	.....	500	12.50	1,065.00	1,057.00
Donetz.....	"	Steel.....	.....	.....	.....	1,080.00	1,225.00
Dourges.....	"	Coal.....	.....	1,000	300.00	20,980.00	21,000.00
Dynamite Centrale.....	France	Explosives.	.....	500	12.50	504.00	542.00
Espinac	"	Coal	2,500	500	20.83	600.00	600.00
Escombrera-Bleyberg..	Spain	Lead.....	.....	500	35.00	1,109.0	1,165.00
Fraser River.....	Brit. Col'mb	Gold.....	250,0 0	25	.....	8.00	10.00
Huanchaca.....	Bolivia	Silver.....	40,000,00	125	5.00	47 75	50 25
Langlaagte Estate.....	S. Africa	Gold.....	11,250,000	25	11.25	19 0	19 0
Lagunas.....	Chile	Nitrates ..	16,250,000	125	12.5	33.0	33 00
Laurium.....	Greece	Zinc & lead.	16,300,000	500	30.00	600 0	630.00
Lautaro.....	Chile	Nitrates....	13,750,000	125	.....	100.0	96 00
Malfidiano.....	Italy	Zinc.....	14,500,000	500	40.00	1,120.0	1,300 00
Metaux, Cie. Fran. de..	France	Metal d'lers.	25,000,00	500	30.00	645.00	640. 0
Mokta-el-Hadid.....	Algeria	Iron.....	18,312,500	500	40.00	1,04 0	1,000.00
Napthe Baku.....	Russia	Petroleum.	.....	.....	.....	782.0	868.00
Napthe, Le.....	"	"	.....	.....	.....	2,67 .0	2,675 0
Napthe Nobel.....	"	"	.....	.....	.....	580 0	625 00
" " parts.....	"	"	.....	.....	.....	11,650 0	12,650.00
Nickel.....	N.Caled'nia	Nickel ..	10,000,00	2 0	30.00	380.0	390 00
Paccha-Jazpampa.....	Chile	Nitrates..	9,000,000	125	.....	2 50	2 50
Penarroya.....	Spain	Coal, etc...	.....	500	65.00	2,40 0.0	2,595 0
Rebecca.....	Colo'do,U.S.	Gold.....	.....	25	.....	4 00	4 00
Rio Tinto.....	Spain	Copper.....	40,625,000	125	17.70	9 4.0	1,0 0 00
" " preferred..	"	"	40,625,000	125	.....	156.0	170 0
Rive-de-Gier.....	France	Coal	.....	.....	.....	22 65	24 25
Robinson	S. Africa	Gold.....	68,750,000	125	12.50	264.0	285.00
St. Etienne.....	France	Coal.....	.....	.....	18.00	456.00	459 0
Salines de l'Est.....	France	Salt.....	.....	500	11.50	280.0	275. 0
Salines du Midi.....	France	" etc.....	.....	50	20.00	875 00	875 00
Sels Gem.de la Rus.Mer	Russia	" etc.....	.....	500	25.00	605.00	645.0
Tharsis.....	Spain	Copper.....	33,750,000	50	8.75	219.0	236.00
Vicoigne-Neux.....	France	Coal	.....	1,000	700.00	22,680.0	22,495.0
Vielle Montagne.....	Belgium	Zinc.....	9,000,000	80	30.00	759 00	798.75

MEETINGS.

NAME OF COMPANY	Location	Meeting.	Date.	Place.
Alliance	Utah	Special	Mar. 4	Progress Block, Salt Lake City, Utah
Allouez.....	Michigan	Annual.	Mar. 14.	18 William st., New York City.
Baltic	"	"	Mar. 6	" "
Gladstone.....	Utah	"	Mar. 13	Deseret Nat. Bk.Bldg., Salt Lake City, Utah
Juanita.....	California	"	Feb. 28.	420 Front st , San Francisco, Cal.
May Day.....	Utah	Annual.	Apr. 7.	Salt Lake City, Utah.
Mohawk Con.	"	"	Mar. 8.	" "
Morning Glory.....	"	Special.	Mar. 14	418 Atlas Block, Salt Lake City. Utah.
Opohongo	"	Annual.	Feb. 27.	76 W 2d South st., Salt Lake City, Utah.
Osceola.....	Michigan	"	Mar. 9.	203 Atlas Block, " "
Standard Con.....	California	"	Feb. 27.	Boston, Mass.
Star.....	Utah	"	Mar 21.	340 Pine st., San Francisco, Cal.
.....	.....	.....	.....	Salt Lake City, Utah
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

DIVIDENDS.

NAME OF COMPANY.	Current dividends. Date.	Current dividends. Am't.	Paid since Jan. 1, 1899.	Total to date.
*Alaska-Mexican.	.....	.. ..	$18,000	$335,031
*Alaska-Treadwell	.....	.....	75,000	3,99 ,000
*Ætna Con.....	.....	.....	10,000	460,000
*Anchoria-Leland..	.....	.....	18,000	192,000
*Apollo Con., Alas..	.....	.....	40,000	140,000
*Argonaut, Cal....	.....	.....	20,000	200,00
*Boston& Colo.Sm	.....	.....	75,000	300,000
Boston & Mont..	Feb.20	750,000	750,000	9,875,000
Breece	Mar. 1	10 000	10,000	40,000
Bul.Beck.&Champ	Feb.15	10,000	10 000	2,328,400
Calumet & Hecla..	Mar23	4,000,000	4,000,000	60,850 000
*Bunker Hill & S..	Feb. 4	21,000	42 000	642,000
*Centenn'l Eureka	Feb.15	15,000	30,000	2,040,000
*Central Lead....	Feb.	5,000	10,000	92,000
*Colorado Sm.....	.....	.. ..	100,000	1,945,000
*Deer Trail No. 2, Wash.....	.....	.....	2,500	17,500
*Doe Run.....	Feb.	2,500	5,000	65,000
*Empire State, Ida.	Feb.15	14,777	29,554	91,436
*Germania Lead..	....	....	3,750	.....
*Gold Coin, Vict..	.....	.....	10,000	165,000
*Golden Cycle....	.....	.....	5,000	158,500
Gold King, Col....	Feb.20	10,000	10,000	10,000
Golden M. & Ex...	Feb 25	10,000	10,000	10,000
*Grand Central, Ut	Feb.10	31,250	62,500	281,250
*Grass Valley Ex.	.....	.....	7 500	.....
*Highland.	Feb.16	20,000	40,000	3 824,718
*Homestake.....	Feb 25	62,500	125,000	7,306,250
*Idaho, B. C.....	.....	.....	2 8,000	292,000
Isabella.....	Feb.25	135,000	135,000	405,000
†Lillie.....	Feb. 1	12,500	25,000	62,500
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

NAME OF COMPANY.	Current dividends. Date.	Current dividends. Am't.	Paid since Jan 1, 1899.	Total to date.
*Mercur..	.....	.....	$25,000	$1,266,000
Montana, Ltd	Feb 15	20,000	20,000	374,845
*Mont. Ore Pur	.....	.....	80,000	880,000
*Morning Star, Cal	Feb.	9,600	19,200	707,400
Moulton, Mont	Feb.15	20,000	20,000	480 000
*Napa Con.....	.....	.....	20,000	970,000
*New Idria.....	.....	.....	20,000	100,000
N. Y. & Hond-Rosario	Feb.20	15,000	15,000	990,000
*Parrot	Feb.18	69,000	138,000	2,276,898
*Pennsylvania....	Feb. 9	2,575	5.150	56,800
*Plumbago, Cal..	.....	.....	45.000	45,000
*Portland	Feb.15	60,000	120.000	2,827,080
Quincy.....	Feb.15	350,000	350,000	10,470,000
*Republic, Wash .	.....	.....	30,000	120,000
*Sacramento	Feb. 1	5,000	10,000	67,000
*Silver King.....	Feb.10	37,500	87,500	1,837.500
Small Hopes.....	Feb.16	25,000	25,000	3,325,000
*Smuggler.....	.....	.....	10,000	1,105.000
*Strong	.....	.....	25,000	470,000
*Swansea	Feb.10	5,000	10,000	146,500
*Utah, Utah.....	.....	.....	2,000	179.000
*Vindicator.....	.....	.....	50 750	177,625
*War Eagle, B. C.	Feb.15	26,250	52.500	230,250
*Yellow Aster....	.....	.....	10,000	168,789
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
Grand Total....	.....	$5,764,452	$6,896,904	125,084,692

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

ASSESSMENTS.

NAME OF COMPANY.	Location.	No.	Delinq.	Sale.	Amt.
*Alta	Nev....	61	March 10	April 4	.05
*Belcher.....	Nev....	60	" 21	" 11	.10
*Challenge Con..	Nev....	26	" 15	" 5	.05
Central Eureka..	Nev....	10	" 5	March 27	.02
Chic'go & Mercur	Utah..	...	Dec. 12	" 3	.01
Eureka Con.....	Cal ..	16	Feb. 24	" 11	.00½
Florence.....	Utah ..	1	March 13	" 31	.00½
*Gold & Sil.Carb.	Utah..	...	" 16	April 3	.00½
*Great Wester n	Cal....	5	" 29	" 10	.15
Hale & Norcross.	Nev....	1	Feb. 7	Feb. 28	.15
Julia Con.....	Nev....	29	" 17	March 8	.03
Justice.....	Nev....	64	" 23	" 16	.03
Larkin.....	Utah..	4	" 15	" 4	.02
Marguerite.....	Cal....	12	" 6	" 6	.10
Marina Marsicano	Cal ..	17	" 21	" 13	.04
*R. G. W ...	Utah..	1	March 18	April 4	.01
Savage.....	Nev. ..	97	Feb. 6	Feb. 27	.10
Shower Con.....	Utah...	1	March 1	April 3	.02
Sierra Nevada...	Nev....	115	Feb. 21	March 13	.20
Silver King	Ariz..	20	" 21	" 21	.25
Snow Flake..	Utah...	11	" 13	" 4	.01
Star	Utah..	..	" 25	" 13	.03
Success.....	Utah..	2	" 18	" 11	.00¼
Sunbeam.....	Utah ..	20	Dec. 12	Feb. 25	.00½
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Total Levied.	Assessments. Date and Amount of Last.			Dividends. Total Paid.	Dividends. Date and Amount of Last.		
1	Adams, s. l. c.	Colo..	$1,500,000	150,000	$10	*				$693,500	Oct...	1895	.04
2	Ætna Cons., q.	Cal ..	500,000	100,000	5	*				160,000	Jan...	1899	.10
3	Alaska-Mexican, g.	Alask	1,000,000	200,000	5					317,031	Nov..	1898	.10
4	Alaska-Treadwell, g..	Alask	5,000,000	200,000	25	*				3,925,000	Nov..	1898	.37½
5	Alice, g. s.	Mont.	10,000,000	400,000	25	*				1,075,000	April.	1898	.05
6	American Gold, g. s. c. l	Colo..	3,000,000	300,000	10	*				362,000	Oct...	1898	.09
7	Anaconda Copper	Mont.	30,000,000	1,300,000	25					8,250,000	Nov.	1898	1.25
8	Anchoria-Leland, g.	Colo..	600,000	600,000	1	*				180,000	Jan...	1899	.01
9	Argentum Juniata, g. s. l	Colo..	2,600,000	1,300,000	2	*				156,000	Oct...	1895	.03
10	Associated, g.	Colo.	1,250,000	1,250,000	1	*				62,000	Dec..	1898	.01
11	Atlantic, c.	Mich.	1,000,000	40,000	25					780,000	Feb..	1898	1.00
12	Aurora, l.	Mich.	2,500,000	100,000	25	*				750,000	May..	1898	.50
13	Bald Butte	Mont.	250,000	250,000	1	*				649,648	Dec..	1898	.06
14	Bangkok-Cora Bell, s. l.	Colo..	600,000	600,000	1					106,000	July..	1896	.01
15	Big Six, g. s.	Colo..	500,000	500,000	1					15,000	May..	1898	.00½
16	Boston & Colorado, i.	Colo..	750,000	15,000	50					300,000	Jan..	1899	5.00
17	Boston & M. Cons., g. s. c	Mont.	3,750,000	150,000	25	*				9,125,000	Nov..	1898	5.00
18	Breece, i.	Colo..	5,000,000	200,000	25					30,000	Dec..	1898	.05
19	Bullion-Beck & Champ.	Utah.	1,000,000	100,000	10	*				2,318,400	Nov..	1898	.10
20	Bunker Hill & S., s. l.	Idaho	3,000,000	300,000	10					621,000	Jan..	1899	.07
21	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25					56,850,000	Dec..	1898	10.00
22	Cariboo, g.	B.C..	800,000	800,000	1					236,965	Aug..	1898	.02
23	Centen l-Eureka, g. s. l. c	Utah.	1,500,000	30,000	50	30,000	Mar..	1889	1.00	2,010,000	Mar..	1897	1.00
24	Central Lead, l.	Mo...	1,000,000	10,000	100	*				87,000	Jan..	1899	.50
25	Champion, g. s.	Cal..	340,000	34,000	10					296,200	April.	1898	.25
26	Charleston, p. r.	S. C..	1,000,000	10,000	100	*				180,000	Dec..	1898	1.50
27	Colorado, Sm., g. s. c	Mont.	1,000,000	100,000	10	*				1,945,000	Jan..	1899	1.00
28	Con. Tiger & Poorman	Idaho	1,000,000	1,000,000	1	*				20,000	Dec..	1898	.02
29	Creston Leasing	Colo..	1,000,000	1,000,000	1					10,000	Dec..	1898	.01
30	Crowned King, g. s. l.	Ariz .	6,000,000	600,000	10	*				232,000	Dec..	1898	.02
31	Dalton & Lark, s. l.	Utah.	2,500,000	2,500,000	1					87,500	Aug..	1896	.00½
32	Daly, s. l.	Utah.	3,000,000	150,000	20					2,925,000	Mar..	1897	.25
33	†Deadwood-Terra, g. s. c.	S. D..	5,000,000	200,000	25	*				1,350,000	May..	1898	.15
34	De Lamar, g. s.	Idaho	2,000,000	400,000	5					2,298,000	May .	1898	.29
35	Della S.	Colo..	1,000,000	1,000,000	1					60,000	Jan..	1897	.10
36	Dutch, g	Cal ..	1,500,000	150,000	10					39,000	Feb..	1898	.01½
37	Elkton Cons., g.	Colo..	1,250,000	1,250,000	1					656,961	Nov..	1898	.01½
38	El Paso, g. s.	Colo..	650,000	650,000	1					12,393	Jan..	1898	.01
39	Enterprise, s. l.	Colo..	500,000	500,000	1					900,000	Sept..	1898	.05
40	Empire State-Idaho	Idaho	1,000,000	100,000	10					61,902	Dec..	1898	.10
41	Fern	B.C..	200,000	200,000	1					10,000	Jan..	1898	.05
42	Florence, s.	Mont.	2,500,000	500,000	5	*				137,530	Aug .	1897	.01
43	Franklin, c.	Mich.	1,000,000	40,000	25					1,340,000	Jan..	1894	2.00
44	Galena, g. s. l.	Utah.	1,000,000	100,000	10					71,000	Jan..	1897	.05
45	Garfield-Grouse, g.	Colo..	1,200,000	1,200,000	1	*				24,000	Feb..	1897	.01
46	Geyser-Marion, g.	Utah.	1,500,000	300,000	5					96,000	Sept..	1898	.02
47	Gold Coin, g. s.	Colo..	1,000,000	200,000	5	*				160,000	Nov..	1897	.05
48	Gold Coin of Victor, g..	Colo..	1,000,000	1,000,000	1					169,000	Jan..	1899	.01
49	Golden Cycle, g.	Colo..	1,000,000	200,000	5					158,500	Jan..	1899	.02½
50	Golden Fleece, g. s.	Colo..	600,000	600,000	1	*				569,179	Feb..	1897	.01
51	Gold & Globe, g.	Colo..	750,000	750,000	1					51,625	July..	1897	.00⅄
52	Golden Reward, g.	S. D..	1,000,000	100,000	10					155,000	Feb..	1898	.15
53	Grand Central, g.	Utah.	250,000	250,000	1					250,000	Jan..	1899	.12½
54	Hall Mines, Ltd.	B. C..	1,250,000	250,000	5					160,000	May .	1898	.25
55	Hecla Cons., g. s. c. l.	Mont.	1,500,000	30,000	50	*				2,175,000	Feb..	1897	.50
56	Helena & Frisco, s. l.	Idaho	2,500,000	500,000	5	*				475,000	Aug..	1896	.04
57	Highland, g.	S. D..	10,000,000	100,000	100	304,000				3,804,718	Jan..	1899	.20
58	Holy Terror, g.	S. D..	500,000	500 600	1					117,000	Sept..	1898	.03
59	Homestake, g.	S. D..	12,500,000	125,000	100	200,000	July..	1878	1.00	7,243,750	Jan..	1899	.50
60	Hope of St. Louis, s.	Mont.	1,000,000	100,000	10	*				762,252	Mar..	1898	.10
61	Horn-Silver, g. s. c. sp. l.	Utah.	10,000,000	400,000	25	*				5,210,000	Oct...	1898	.05
62	Idaho	B. C..	500,000	500,000	1					202,000	Jan..	1899	.05‡
63	Iowa, g.	Colo..	1,000,000	1,000,000	1					95,000	June.	1898	.00½
64	Iron Mountain, g. s. l. i.	Mont.	5,000,000	500,000	10	*				507,500	April.	1898	.02
65	Isabella, g.	Colo..	2,250,000	2,250,000	1					270,000	June.	1897	.00½
66	Jersey Leasing	Colo..	200,000	158,167	1					137,875	Oct...	1898	.03½
67	Last Chance, s. l.	B. C..	500,000	500,000	1	*				40,000	Jan..	1897	.04
68	Le Roi	B. C..	2,500,000	500,000	5					825,000	April.	1898	.10
69	§§§Lillie, g.	Colo..	1,250,000	250000	5					37,500	Dec..	1898	.05
70	Mammoth, g. s. c.	Utah.	10,000,000	400,000	25	*				1,350,000	Dec..	1898	.05
71	Matoa, g.	Colo..	1,000,000	1,000,000	1					25,000	Dec..	1898	.02½
72	Mead, g.	Cal..	200,000	200,000	1					80,000	Dec..	1898	.40
73	Mercur, g.	Utah.	5,000,000	200,000	25	*				1,266,000	Jan..	1899	12½
74	Minnesota Iron, i.	Minn.	16,500,000	165,000	100	*				4,735,000	Oct...	1898	1.50
75	Modoc, g.	Colo..	500,000	500,000	1					100,000	Dec..	1898	.01
76	Montana, Ltd., g. s.	Mont.	3,300,000	660,000	5	*				2,925,640	May .	1898	.05‡
77	Montana Ore Purchas'g	Mont.	2,500,000	80,000	25	*				880,000	Jan..	1899	1.00
78	Moon-Anchor, g.	Colo..	600,000	600,000	1	*				261,000	Nov..	1898	.07½
79	Moose, g.	Colo..	600,000	600,000	1					186,000	Jan..	1896	.01
80	Morning Star, g.	Cal..	240,000	2,400	100	70,800	Feb..	1887	.75	678,600	Dec..	1898	5.00
81	Mt. Rosa, g.	Colo..	1,000,000	1,000,000	1					60,000	Jan..	1898	.02
82	Mountain Copper	Cal ..	6,250,000	250,000	25					93,750	Sept..	1898	.62½
83	Napa Cons., q.	Cal ..	700,000	100,000	7	*				970,000	Jan..	1899	.20
84	New Idria Quicksilver..	Cal ..	500,000	100,000	5					100,000	Jan..	1899	.20
85	N.Y.&Hon Rosario, s. g.	C. A..	1,500,000	150,000	10	*				1,102,500	Dec..	1898	.10
86	North Star, g.	Cal ..	2,000,000	200,000	10	20,000	June.	1885	.02	500,000	Nov..	1898	.25
87	Ontario, s. l.	Utah.	15,000,000	150,000	100					13,557,500	Nov..	1897	.75
88	Ophir Hill	Utah.	25,000	1,000	25					20,000	Dec..	1898	20.00
89	Osceola, c.	Mich.	2,500,000	100,000	25	*				2,522,500	Dec..	1898	2.00
90	Parrot, c.	Mont.	2,300,000	230,000	10	*				2,207,898	Jan..	1899	.30
91	Pennsylvania Cons.	Cal..	5,150,000	51,500	100	50,051	Feb..	1892	.05	54,225	Jan..	1899	.05
92	Pioneer g.	Cal..	1,000,000	100,000	10					50,000	Dec..	1898	.12½
93	Plumbago, g.	Cal ..	300,000	300,000	1					45,000	Jan..	1899	.15
94	Portland, g.	Colo..	3,000,000	3,000,000	1	*				2,227,080	Dec.	1898	.02
95	Princess, g.	Colo..	1,000,000	1,000,000	1					45,000	Feb..	1897	.00½
96	Quincy, c.	Mich.	2,500,000	100,000	25	*				10,470,000	Feb..	1899	3.50
97	Rambler-Cariboo	B. C..	1,000,000	1,000,000	1					40,000	April.	1897	.02
98	Raven, g.	Colo..	1,500,000	1,500,000	1					15,000	Mar..	1898	.01
99	Reco, s. l.	B. C..	1,000,000	1,000,000	1					297,500	Jan..	1898	.10
100	Republic, g.	Wash	1,000,000	1,000,000	1					120,000	Jan..	1899	.03
101	Sacramento, g.	Utah.	5,000,000	1,000,000	5					62,000	Jan..	1899	.00½
102	St. Joseph, l.	Mo...	3,000,000	300,000	10	*				2,784,500	Dec..	1898	1.50
103	Santa Rosalia, g. s.	Cal..	100,000	100,000	1					125,000	Feb..	1898	.10
104	Silver King, g. s. l.	Utah.	3,000,000	150,000	20	3,000	Jan..	1897	.02	1,800,000	Dec..	1898	.25
105	Slocan Star.	B. C..	1,000,000	2,000,000	0.50					400,000	Mar..	1897	.05
106	Small Hopes, s.	Colo..	5,000,000	250,000	20	*				3,300,000	June.	1898	.10
107	Smuggler, s. l. z.	Colo..	1,000,000	1,000,000	1					1,105,000	Jan..	1899	.01
108	South Swansea, s. l.	Utah.	150,000	150,000	1					104,960	Aug..	1898	.05
109	§§Standard Cons., g. s.	Cal..	20,000,000	200,000	100					5,674,940	Aug..	1898	.10
110	Swansea, s. l.	Utah.	500,000	100,000	5					141,500	Jan..	1899	.05
111	Tamarack, c.	Mich.	1,500,000	60,000	25					5,570,000	Dec..	1898	4.00
112	Tomboy, g.	Colo..	2,000,000	200,000	10	*				650,000	Dec..	1898	.25
113	Union, g.	Colo..	1,250,000	1,250,000	1					73,000	June.	1896	.01
114	Utah	Utah.	1,000,000	100,000	10	*				177,000	Dec..	1897	.01
115	Victor, g.	Colo..	1,000,000	200,000	5	*				1,155,000	Dec..	1898	.50
116	Vindicator, Cons. g.	Colo..	1,500,000	1,015,000	1					177,625	Jan..	1899	.05
117	§§ War Eagle, Cons.	B. C..	2,000,000	1,750,000	1					204,000	Jan..	1899	.01½
118	Western Mine Enterp.	Mont.	500,000	500,000	1	*				48,680	Jan..	1898	.20
119	Whitewater.	B. C..	625,000	125,000	5					194,000	April.	1898	.32
120	Wolverine, c.	Mich.	1,500,000	60,000	25	180,000	Mar..	1895	1.00	60,000	Oct...	1898	1.00
121	Yellow Aster, g.	Cal..	1,000,000	100,000	10	*				168,789	Dec..	1898	.10

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Total Levied.	Assessments. Date and Amount of Last.		
1	Ada Cons., s. l.	Utah.	$100,000	100,000	$1	$3,333	Nov..	1895	.01½
2	Alamo, g. c. i.	Utah.	125,000	125,000	1	937	Mar..	1898	.00¾
3	Alliance, g. s. l.	Utah.	100,000	100,000	1	200,000	Dec..	1895	.10
4	Allouez, c.	Mich.	2,000,000	80,000	25	1,520,937	June.	1894	1.00
5	** Alpha Cons., g. s.	Nev..	105,000	105,000	1	316,050	Nov..	1898	.03
6	** Alta, s.	Nev..	216,000	108,000	2	3,664,910	Nov..	1898	.05
7	American Quartz, g.	Cal..	1,000,000	100,000	10	1,000	Feb..	1897	.01
8	Anchor, g. s. l.	Utah.	1,500,000	150,000	10	560,000	Aug..	1893	.20
9	** Andes, g.	Nev..	300,000	100,000	3	1,200,000	Jan..	1899	.05
10	Baliol, g.	Cal..	1,000,000	100,000	10	55,000	Mar..	1898	.30
11	** Belcher, s. g.	Nev..	312,000	104,000	3	3,514,800	Nov..	1898	.10
12	Belle Isle	Nev..	10,000,000	100,000	100	240,271	July..	1896	.10
13	Benton Con, s.	Nev..	10,800,000	108,000	100	587,023	June.	1897	.25
14	**Best & Belcher, g. s	Nev..	362,400	100,800	3	2,589,643	Nov..	1898	.10
15	Bogan	Utah.	1,250,000	125,000	10	26,875	Dec..	1897	.01½
16	Boston & Cp. Ck., g..	Co'o..	400,000	200,000	2	20,000	Aug..	1898	.10
17	Brunswick Cons., g..	Cal..	500,000	500,000	1	160,000	July..	1897	.03
18	** Bullion, s. g.	Nev..	100,000	100,000	1	3,120,000	Nov..	1898	.05
19	Caledonia.	Nev..	300,000	200,000	3	3,210,000	ov..	1897	.10
20	Centennial, c.	Mich.	2,500,000	100,000	25	460,000	Mar..	1898	3.00
21	Central Eureka, g...	Cal..	4,000,000	400,000	10	84,000	Jan..	1899	.01½
22	**Challenge Cons, s. g.	Nev..	150,000	50,000	3	427,500	May .	1898	.10
23	**Chollar, g. s.	Nev..	336,000	112,000	3	2,050,800	Jan..	1899	.10
24	**Confidence, g. s.	Nev..	74,880	24,960	3	540,126	Nov..	1898	.10
25	**Con., Cal. & Va...	Nev..	540,000	216,000	2½	678,000	July..	1898	.25
26	**Cons. Imperial, g. s	Nev..	500,000	500,000	1	2,246,000	Nov..	1898	.01
27	**Con. New York	Nev..	100,000	100,000	1	160,500	Nov..	1898	.03
28	**Crown Point, g. s..	Nev..	300,000	100,000	3	2,970,000	Nov..	1898	.10
29	Dalton, s. l.	Utah.	2,500,000	500,000	5	53,750	Sept..	1898	.00½
30	Dexter	Nev..	1,000,000	200,000	5	38,000	Apr..	1898	.15
31	Eagle, g. s.	Cal..	500,000	100,000	5	5,000	Dec..	1896	.05
32	Eagle, g. s.	Ore..	1,000,000	100,000	10	6,000	Oct..	1898	.01½
33	Emerald	Utah	300,000	300,000	1	3,000	Oct..	1898	.00¾
34	Eureka Cons., g. s. l..	Nev..	1,000,000	50,000	20	585,000	Sept..	1898	.20
35	Eureka Con. Drift, g.	Cal..	500,000	500,000	1	172,500	Nov..	1898	.00½
36	** Exchequer, g. s..	Nev..	1000,000	100,000	1	1,020,000	Dec..	1897	.05
37	Four Aces	Utah.	250,000	250,000	1	5,000	Mar .	1898	.01
38	Galena	Utah.	1,000,000	100,000	10	10,000	Oct..	1898	.10
39	Geyser, s. l.	Colo..	5,000,000	500,000	10	1,125,000	Jan..	1899	.10
40	Gold Belt, g. s.	Utah.	500,000	500,000	1	3,012	July..	1896	.00½
41	Golden Fleece Grav. g	Cal..	130,000	130	1000	56,260	Mar..	1897	2.00
42	Gold King, g.	Colo..	1,000,000	1,000,000	1	*			
43	** Gould & Curry	Nev..	324,000	108,000	3	4,614,350	Dec..	1898	.10
44	Great Eastern, g.	Utah.	1,500,000	300,000	5	5,000	Oct..	1898	.00½
45	Great Western, q.	Cal..	5,000,000	50,000	100	63,026	Jan..	1899	.15
46	Hale & Norcross, g. s..	Nev..	11,200,000	112,000	100	5,688,280	Apr..	1898	.10
47	Horse Shoe Bar Cons.	Cal..	6,000,000	60,000	100	85,800	Jan..	1899	.05
48	Idlewild, g	Cal..	1,000,000	100,000	10	*			
49	Iron Silver, s. l.	Colo..	10,000,000	500,000	20	*			
50	Jackson, l.	Mich.	300,000	12,000	25	*			
51	Jupiter, g.	Cal..	2,000,000	20,000	100	80,000	Feb..	1898	.20
52	** Julia Con.	Nev..	110,000	110,000	1	1,498,800	Jan..	1899	.03
53	** Justice, g. s. c.	Nev..	210,000	105,000	2	3,646,750	Nov..	1898	.10
54	Kentuck	Utah.	600,000	300,000	2	30,000	Aug..	1898	.10
55	** Kentuck Cons., s..	Nev..	105,000	105,000	1	125,300	June.	1898	.05
56	Keystone, g.	Colo..	1,500,000	1,500,000	1	*			
57	Lacrosse, g.	Colo..	1,000,000	100,000	10	*			
58	Little Pittsburg	Utah.	2,000,000	400,000	5	18,000	Dec..	1898	.01
59	Lower Mammoth	Utah.	150,000	150,000	1	15,000	Oct..	1898	.05
60	Lucky Bill	Utah.	300,000	120,000	2.50	56,400	June.	1898	.01½
61	Marguerite, g.	Cal..	500,000	50,000	10	70,000	Nov..	1898	.10
62	May Day	Utah.	100,000	400,000	¼	4,000	Jan..	1899	.00½
63	Mayday, g. s.	Cal ..	50,000	50,000	1	5,000	May..	1898	.10
64	Mayflower, g	Cal..	1,200,000	60,000	20	6,000	Sept..	1898	.05
65	Merced, g.	Cal..	1,500,000	100,000	15	200,000	July..	1896	2.00
66	Meteor, s. l.	Utah.	600,000	300,000	2	3,734	Oct..	1898	.00½
67	** Mexican, g. s.	Nev..	302,400	100,809	3	2,258,720	Nov..	1898	.10
68	Montreal	Utah.	2,500,000	250,000	10	18,125	Jan..	1899	.05
69	Mt. Diablo s.	Nev..	5,000,000	50,000	100	150,000	Dec..	1898	.10
70	Morning Star, s.	Nev..	1,500,000	150,000	10	32,500	Dec..	1898	.00½
71	Nashville, g.	Cal ..	115,000	11,500	10	2,000	Sept..	1898	.17
72	North Banner, g. s..	Cal..	1,000,000	100,000	10	21,794	Oct..	1896	.02
73	North Belle Isle, s..	Nev..	10,000,000	100,000	100	523,074	July..	1896	.10
74	***No. Gould & Curry	Nev..	100,000	100,000	1	375,000	Dec..	1898	.10
75	Northern Light, g....	Utah.	2,000,000	400,000	5	80,000	July..	1898	.10
76	**Occidental Cons g s	Nev..	300,000	160,000	3	499,179	Dec..	1898	.10
77	** Ophir, g. s.	Nev..	324,000	108,000	3	4,602,568	Sept..	1898	.15
78	Opohonga	Utah.	200,000	100,000	2	1,500	June.	1898	.01
79	Oro Cache, g. s.	S. D..	1,250,000	250,000	5	6,250	July..	1893	.00½
80	Osceola, g.	Cal ..	10,000,000	100,000	100	10,924	Sept..	1898	.01
81	*** Overman, g. s..	Nev..	230,400	115,200	2	4,129,690	Dec..	1898	.05
82	Peer, s.	Ariz..	10,000,000	100,000	100	215,000	July..	1894	.05
83	Peerless, s.	Nev..	10,000,000	100,000	100	410,000	July..	1894	.02
84	Pine Hill, g.	Cal ..	1,000,000	100,000	10	30,000	July..	1897	.05
85	** Potosi, g. s.	Nev..	336,000	112,000	3	2,157,200	Dec..	1898	.10
86	Quicksilver, pref., q...	Cal .	4,300,000	43,000	100	*			
87	Quicksilver, com. q...	Cal .	5,700,000	57,000	100	*			
88	Red Mountain, s.	Colo..	300,000	60,000	5	22,500	Mar..	1891	.12½
89	Rescue, g.	Nev..	100,000	[10,000	10	5,000	June.	1898	.10
90	Reward, g.	Cal..	64,000	64,000	1	63,680	Nov..	1898	.02
91	Ridge, c.	Mich.	500,000	20,000	25	239,939	Feb..	1897	1.00
92	St. Mary, c.	Mich.	1,000,000	40,000	25	4,000	July..	1895	.05
93	** Savage, g. s.	Nev..	280,000	112,000	2½	7,298,600	Nov..	1898	.10
94	Scorpion, s.	Nev..	100,000	100,000	1	445,000	Dec..	1897	.05
95	**Seg. Belcher & Mg s	Nev..	200,000	100,000	2	368,000	Nov..	1898	.13
96	Sevier, g. s.	Utah.	1,250,000	250,000	5	50,000	April.	1897	.04
97	Shower Con.	Utah.	2,000,000	400,000	5	8,000	Mar..	1899	.02
98	**Sierra-Nevada, g. s	Nev.	300,000	100,000	3	6,706,910	Feb..	1898	.20
99	Silver Age, g. s. l.	Colo..	2,000,000	200,000	10	*			
100	** Silver Hill, s.	Nev..	108,000	108,000	1	2,220,200	May .	1898	.05
101	Silver King, s.	Ariz..	10,000,000	100,000	100	440,000	Oct ..	1898	.25
102	Silver Queen, c.	Ariz..	5,000,000	200,000	25	*			
103	Silver State, g.	Colo..	700,000	700,000	1	*			
104	Silver State, s. g. l..	Utah.	100,000	100,000	1	1,000	Sept..	1897	.00½
105	Siskiyou Con., s.	Cal ..	2,000,000	200,000	10	46,000	Apr..	1898	.01
106	South Fork Con.	Utah.	50,000	50,000	1	5,000	Mar..	1898	.01
107	Star, g. s.	Utah.	1,000,000	200,000	5	1,000	Mar..	1898	.00½
108	Sunbeam Cons.	Utah.	250,000	250,000	1	23,125	Nov..	1898	.01
109	Tecumseh, c.	Mich.	1,000,000	40,000	25	40,000	July..	1897	1.00
110	Temonj, g.	Colo..	1,000,000	1,000,000	1	*			
111	Tetro	Utah.	300,000	300,000	1	21,000	Jan..	1899	.01
112	Tombstone, g. s. l.	Ariz.	12,500,000	500,000	25	*			
113	Tornado Con., g. s..	Nev..	100,000	100,000	1	*			
114	** Union Cons., g. s..	Nev..	250,000	100,000	2½	2,633,000	Jan..	1899	.03
115	** Utah Cons., s.	Nev..	100,000	100,000	1	475,000	Jan..	1899	.05
116	Victory, g. s.	S. D..	1,250,000	250,000	5	2,625	Nov..	1896	.001½
117	West Granite Mt., s..	Mont.	500,000	100,000	5	*			
118	Work, g.	Colo..	1,250,000	1,250,000	1	*			
119	World, g.	Colo..	1,500,000	1,500,000	1	*			
120	***Yellow Jacket, g. s	Nev..	360,000	120,000	3	5,788,000	May .	1898	.20
121	Yellow Jacket	Utah.	300,000	300,000	1	1,500	Dec..	1897	.00⅄

G., 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.

	Cust.	Meas.	Price.
Abrasives—			
Carborundum, f.o.b. Niagara Falls grains	lb.		$0.15
Powdered	"		.10
Corundum, N. C.	"		.07@.10
Chester	"		.04½@.05
Emery, Turkish flour	"		.03
Grains	"		.05
Naxos flour	"		.03
Grains	"		.05
Chester flour	"		.03
Grains	"		.05
Peekskill flour	"		.01¾
Grains	"		.02½
Crude, Kuluk, best	lg. ton		18.50
Levant, "	"		22.00
Naxos (Greek) best	"		32.00
Pumice Stone, Am. powd.	lb.		.01@½@.02
Italian, powdered	"		.01½
Lump, per quality	"		.04@.40
Rottenstone, ground	"		.02¼@.03
Lump, according to quality	"		.06@.18
Rouge	"		.17@.30
Tripoli, prepared	sh. ton.		20.00
Acids—Acetic, 30% pure	lb.		.02¾
36% ch. pure	"		.06¾
80% pure	"		.09
Glacial, pure	"		.11¾
Chem. pure	"		.21
Benzoic, English	"		1.10
German	"		.48
Boracic, pure cryst.	"		.10½@.11
Powdered	"		.11@.11½
Carbolic, cryst. in drums	"		.16
Carbonic, liquid	"		.10
Chromic, crude	"		.25
Chem. pure	"		.40
Absol. ch. pure	"		1.75
Hydrochloric, ch. pure	"		.08
Hydrofluoric, 30%	"		.03@.04½
48%	"		.05@.06
Best			.25
Nitric, chem. pure	"		.10
Sulphuric, 98%	"		.02
Chem. pure	"		.07
Sulphurous	"		.03½@.05
Tartaric, cryst.	"		.31½@.32
Powder	"		.32@.32½
Alcohol—Grain	gal.		2.44@2.48
Refined wood, 95@97%	"		.75@.80
Purified	"		1.20@1.50
Alum—Lump	100 lbs.		1.65
Powdered	"		2.50
Ground	"		1.75
Chrome, com'l	"		3.50
Aluminum—Nitrate	lb.		1.50
Oxide, com'l	"		.20
Pure	"		.80
Chem. pure	"		1.00
Hydrated	"		.05
Sulphate, pure	"		.02
Ammonia—Aqua, 16°	"		.02½@.03
18°	"		.03@.03½
20°	"		.03½@.04
26°	"		.05½@.06
Ammonium—			
Bromide, pure	"		.52@.53
Carbonate	"		.07¼@.07½
Muriate, gran., white	"		.05¼
Lump	"		.08¾
Gray	"		.05
Nitrate, white, pure (99%)	"		.09
Antimony—Glass	"		.30@.40
Needle, lump	"		.05@.06
Powdered	"		.07@.08½
Oxide, com'l white, 95%	"		.25
Com'l white, 99%	"		.35
Sulphuret, com'l	"		.16
Arsenic—White	"		.04@.04¼
Red	"		.07¾@.08
Asphaltum—California Ventura	sh. ton		32.00
Cuban, best	"		40.00
Common	"		20.00
Egyptian	"		130.00
Trinidad, refined	"		40.00
Gilsonite, Utah, ordinary	"		65.00
Select	"		75.00
Barium—Carbonate, lump, 80@90%	"		25.00@27.50
92@98%	"		25.25@29.00
Powdered, 80@90%	lb.		.01¾@.02
Chloride, com'l	"		.02¾
Chem. pure cryst	"		.05
Nitrate, com'l, pow'd.	"		.07
Pure, pow'd	"		.07@.08
Oxide, com'l, hyd. cryst	"		.18@.22
Hydrated, pure cryst.	"		.25
Pure, powd.	"		.27
Sulphide	"		.40
Sulphate	"		.02¼@.02¾
Barytes—Crude, No. 1	sh. ton		9.00@10.00
No. 2	"		8.00@8.25
No. 3	"		7.75@8.00
Prime White	"		12.00@15.00
American, floated	"		12.50@18.00
Foreign, floated	"		19.50@21.00
Bauxite—Georgia, f.o.b. cars, first grade	lg. ton		3.25@4.50
Second grade	"		3.00
Alabama, f. o. b. cars Rock Run	"		3.85
Benzole—90%	gal.		1.00@1.10
Bismuth—Oxide, hydr.	lb		2.25@2.56
Nitrate cryst.	oz.		.09
Bitumen	lb.		.03½@.05
Bone Ash	"		.02¾@.03½
Borax—			
Cryst. and pow'd.	"		.07@.07¼
Calcined	"		.19
Bromine—Bulk	"		.45
Cadmium—			
Metallic	"		1.90@2.00
Sulphide	"		1.90@2.25
Sulphate	"		2.25@2.50
Calcium—			
Carbide, in ton lots, f. o. b. Niagara Falls, N.Y.	lb.		.03@.04
Acetate, pure white	"		.10
Carbonate, ppt.	"		.05
Chem. pure	"		.75
Chloride	100 lbs.		.90
Sulphite	lb.		.05
Cement—			
Portland, Am., 400 lbs.	bbl.		1.95@2.00
Foreign	"		1.75@2.50
"Rosendale," 300 lbs.	"		.95
Sand cement, 400 lbs.	"		1.85@1.95
Slag cement, imported	"		1.65
Ceresine—			
Orange and Yellow	"		.10@.10½
White	"		.11½@.13½
Chalk—Com'l, lump	sh. ton		2.00@2.10
Ppt.	lb.		.04½
French	100 lbs.		.30@.35
Chlorine—Liquid	lb.		.30
Water	"		.15
Chrome Ore—(50% chrome) ex ship	lg. ton		24.50
Clay, China—Am. com.	"		8.00
Am. best	"		9.00
English, common	"		11.00@12.50
Best grade	"		15.00
Fire, ground, f.o.b. Jersey City, N. J.	"		4.00@5.00
Slip Clay, f.o.b. Albany	"		3.00
Cobalt—Carbonate	lb.		1.50
Nitrate	"		1.30
Oxide—Black	"		1.76
Gray	"		2.25
Smalt	"		.25@.30
Chem. pure	"		5.00
Copperas	100 lbs.		.60@62½
Copper—			
Carbonate	lb.		.14@.16
Chloride	"		.25
Nitrate, crystals	"		.35
Oxide, black	"		.16@.20
Ppt., pure	"		.50
Red	"		.16
Ppt., pure	"		.35@.40
Cream of Tartar—crys.	"		.23¼@.23½
Granulated	"		.23¼@.23½
Powdered	"		.23¾@.24
Cryolite	"		.08½
Explosives—			
Blasting powder, A	"		.08½
Blasting powder, B	"		-05@.05½
"Rackarock," A	"		.25
"Rackarock," B	"		.18
Judson R.R. powder, by carload	"		.10
Dynamite, (40% nitroglycerine)	"		.15
(50% nitroglycerine)	"		.17
(60% nitroglycerine)	"		.19
(75% nitroglycerine)	"		.23
Glycerine, for nitro (32 2-10° Be.)	"		.10¼@.12
Nitro-Benzole	"		.14@.15
Feldspar—Ground	sh. ton		6.75@7.75
Flint—(See Silica).			
Fluorspar—Am. lump	"		5.50
Gravel	"		5.50@7.00
Crushed	"		5.50@7.50
Ground	"		11.00
Extra fine ground	"		12.50
Foreign, lump	"		8.00@12.00
Ground	"		11.50@14.00
Fuller's Earth—Lump	100 lbs.		.75
Powdered, in bags	"		.82½
Graphite—(See Plumbago).			
Gypsum—			
Am. gr'd (terra alba)	sh. ton		7.00
Fertilizer	"		4.50
Rock	lg. ton		4.00
English and French	"		14.00@16.00
Infusorial Earth—Ground, best qualities	"		20.00@.40.00
Iodine—Crude	100 lbs.		2.55
Resublimed	"		2.90@2.95
Iron—Chromate	lb.		.03@.10
Muriate	"		.05
Nitrate, com'l	"		.02
Pure	"		.04
Oxide	"		.02@.12
Scale	"		.01@.03
Kaolin—(See Clay, China).			
Kanit	lg. ton		8.80@9.05
Kryolith—(See Cryolite.)			
Lead—Acetate			
White, broken	lb.		.07
Com'l, broken	"		.06¼
White, gran.	"		.08¼
Nitrate, com'l	"		.06½@.06¾
Chem. pure	"		.35
Lime—Bldg., ab. 250 lbs	bbl.		.65@.75
Finishing	lb.		.75@.80
Magnesite—			
Crude, lump	lg. ton		7.00@12.00
Calcined, foreign	"		20.00@35.00
Domestic	"		12.00@15.00
Bricks	"		45.00@65.00
Magnesium—			
Metallic, ingots (Ger.)	kg.		5.95@6.90
Powdered (Ger.)	"		6.19
Ribbon or wire (Ger.)	"		10.00
Carbonate	lb.		.10
Chloride, com'l	"		.01¾
Fused	"		.20
Nitrate	"		.60
Manganese—			
Crude, powdered, 70@75% binoxide	"		.01¼@.01½
75@85% binoxide	"		.01½@.02½
85@90% binoxide	"		.02½@.03¼
90@95% binoxide	"		.03¼@.05½
Carbonate	"		.16@.20
Chloride	"		.04
Ore, 50%	unit		.21@.22½
Marble—			
Flour	sh. ton		8.08
Mercury—Bichloride	lb.		.59@.60
Bisulphate	"		.41
Mica—Ground	"		.04@.06
Sheets, according to size and quality.			
Mineral Wool—F. o. b. Stanhope, N. J.:			
Slag, ordinary	100 lbs.		1.00
Selected	"		1.67
Extra	"		4.00
Rock, ordinary	sh. ton		37.00
Selected	100 l.-s.		4.00
Extra	"		7.00
Monazite—92%	sh. ton		140.00
Nickel—			
Oxide, black No. 1	lb.		1.00
Black No. 2	"		.60
Green, No. 1	"		1.00
No. 2	"		.60
Oils—Black, reduced 29 gr., 25@30%	gal.		.07@.07½
Black reduced 29 gr. 15 cold test	"		.08@.08½
Black reduced 29 gr. zero	"		.11@.12
Black reduced summer	"		.06½@.07
Smith's Ferry, 33@34 gr.	"		.07½@.08½
West Virginia, 29 gr.	"		.22@.24
Cylinder, dark steam ref	"		.08@.13
Dark filtered	"		.11@.16
Light filtered	"		.13@.15
Extra cold test	"		.21@.25
Gasolene, 86°	"		.14@.15
88°	"		.16@.17
90°	"		.19@.20
Neutral filtered, lemon, 33@34 gr.	"		.13@.18½
White, 33@34 gr.	"		.21@.23
Wool grade, 32 gr.	"		.11@.14
Naphtha, crude, 68@72°	"		.10@.10½
Paraffine, high viscosity	"		.20@.25
23½@24 gr.	"		.09¼@.09¾
25 gr.	"		.08¼@.08½
28@32 gr.	"		.07¼@.07¾
Red No. 1	"		.08¾@.09¼
No. 2	"		.08¼@.08¾
Linseed, domestic raw	"		.41@.42
Boiled	"		.43@.44
Calcutta, raw	"		.54
Graphite, lubricating, Am. dry	lb.		.10
In oil	"		.12
Axle grease	"		.08½@.10
Wood grease	"		.05@.06
Ozokerite—Foreign	"		.06@.08
Paints and Colors—			
Benzine, Sumatra	"		.35@.40
Marbled	"		.27@.28
Chrome green, common	"		.05@.06
Extra	"		.14½@.15
Yellow, common	"		.10
Best	"		.25
Silica Graphite, thick	"		.12
Thinned	gal.		1.15
Lampblack—Com'l	lb.		.03@.05
Refined	"		.08@.10
Calcined	"		.12@.20
Fine spirit	"		.20@.35
Litharge, Am. powd.	"		.04¾@.05¼
English flake	"		.07¾@.08
Metallic, brown	"		.05½
Red	"		18.00@20.00
Ocher, Am. best	sh. ton		15.00
Dutch, washed	lb.		.03¾@.05
French, washed	"		.01@.01¾
Orange mineral, Am.	"		.07½@.08
Foreign, as to make	"		.08½@.10¾
Paris green, pure	"		.12@.14
Red lead, American	"		.05¼@.06
Foreign	"		.07½@.08
Shellac, D. C.	"		.28@.30
Native	"		.16@.17
Turpentine, spirits	gal.		.30@.30½
Ultramarine, best	lb.		.25
Vermilion, Amer. lead	"		.14@.16
Quicksilver, bulk	"		.50
Chinese	"		.65@.80
English, imported	"		.60@.95
Artificial	"		.12@.20
White lead, Am., dry	"		.04½@.04¾
In oil	"		.05¼@.06
English, in oil	"		.07½@.08¼
Whiting, common	100 lbs.		.35@.40
Gilders	"		.45@.50
Zinc white, Am., ex. dry	lb.		.03¾@.04½
American, red seal	"		.04¾@.05¼
Green seal	"		.05¾@.06¾
Foreign, red seal, dry	"		.07¾@.08½
Green seal, dry	"		.08½@.09⅞
Pitch—Coal tar	gal.		.08
Plumbago—American, pulverized, f. o. b., Providence, R. I.	sh. ton		30.00
Lump	"		8.00
German, lump	100 lbs.		.95
Pulverized	lg. ton		16.50
Ceylon, crude	lb.		.01¼@.04½
Pulverized	"		.02@.05
Italian, pulv.	"		.01½
Potash—			
Caustic	"		.04@.05
Potassium—			
Metallic, in balls (Ger.)	kg.		17.85
Bicarbonate cryst.	lb.		.08½
Powdered or gran.	"		.12
Bichromate	"		.09¼@.09¾
Bromide, bulk	"		.41@.45
Carbonate	"		.03@.04
Chromate	"		.35
Cyanide (98@99%)	"		.28
Double manure salts, 48@53% (basis 48%)	100 lbs.		1.03
Muriate, 80@85% (basis 80%)	"		1.78
Permanganate, pure cr.	lb.		.15½@.16
Chem. pure	"		.34
Potassium—			
Silicate	lb.		.06
Prussiate, yellow	"		.16@.17
Red	"		.37@.40
Sulphate, 90@95% (basis 90%)	100 lbs		1.99½
Sulphide, com'l	"		.10
Quartz—(See Silica).			
Rosin—Common	gal.		.10
Best	"		.16
Saltpeter—Crude	lb.		.04¼@.04¾
Double refined	"		.04½@.05
Silica—			
Ground quartz	sh. ton		6.75@8.00
Best	"		12.00
Lump quartz	"		2.50@4.00
Silver—Chloride	oz.		.65
Nitrate	"		.39@.41½
Oxide	"		.85@1.10
Slate—Flour	sh. ton		7.50
Sodium—Metallic	lb.		.75
Acetate, com'l	"		.02¾
Chem. pure	"		.05⅝
Bichromate	"		.07¾@.08
Bisulphite, com'l	"		.01⅞@.02¼
Bromide	"		.49@.50
Chlorate, com'l	"		.09¾@.10
Hyposulphite, com'l	100 lbs.		1.60
Nitrite	lb.		.07½@.07¾
Peroxide	"		.45
Silicate, com'l, 40°	"		.01@.01¼
Sulphate, gran., purified	"		.03
Tungstate, com'l	"		.35
Pure	"		.50
Strontium—Carb., ppt.	"		.13@.14
Nitrate	"		.07½@.07¾
Sulphur—Roll	100 lbs.		2.00
Flour	"		2.20@2.25
Talc—N. C. No. 1	sh. ton		15.00@15.50
No. 2	"		10.00@12.00
N. Y., Fibrous	"		8.00@9.00
French, best	"		20.00
Italian, best	"		20.00
Tin—Chloride	lb.		.11@.13
Crystals	"		.18@.18½
Muriate	"		.10
Oxide, white, ch. pure	"		.28½@.35
Uranium—Oxide	"		1.80@2.00
Zinc—Metallic, ch. pure	"		.06¾
Carbonate	"		.15
Chloride	"		.06
Dust	"		.06¾@.08
Sulphate	"		.02@.02¼

THE RARE ELEMENTS.

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

	Cust.	Meas.	Price.
Barium—Amalgam	grm.		$1.19
Electrol	"		5.71
Beryllium—Powder	"		5.95
Crystals	"		9.04
Nitrate (N. Y.)	oz.		2.50
Boron—Amorphous, pure	grm		.19
Crystals, pure	"		1.43
Nitrate (N. Y.)	lb.		1.50
Calcium—Electrol	grm.		4.28
Cerium—Fused	grm.		2.02
Nitrate (N. Y.)	lb.		28.00
Chromium—Fused	kg.		5.95
Pure powder	"		1.79
Chem. pure cryst	grm.		.19
Cobalt—(98@99%)	kg.		5.35@5.71
Pure	"		30.94
Didymium—Powder	grm.		3.81
Nitrate (N. Y.)	oz.		4.00
Erbium	grm.		3.09
Nitrate (N. Y.)	oz.		3.00
Gallium	grain		9.52
Germanium—Powder	grm.		33.32
Fused	"		35.70
Glucinum—Powder	"		5.95
Crystals	"		9.04
Nitrate (N. Y.)	lb.		2.50
Indium	grm.		4.05
Iridium	"		1.19
Lanthanum—Powder	"		4.28
Electrol, in balls	"		9.04
Nitrate (N. Y.)	oz.		3.50
Lithium	grm.		2.38
Nitrate (N. Y.)	oz.		.60
Molybdenum—Powder	kg.		2.62
Fused, electrol	100 grms.		15.47
Niobium	grm.		3.81
Osmium	"		.95
Palladium	"		.95
Rhodium	"		2.87
Rubidium—Pure	"		4.76
Ruthenium—Pure	"		1.55
Selenium—Com'l powder	kg		26.18
Sublimed powder	"		35.70
Sticks	"		28.56
Silicium—Amorphous	100 grms.		2.87
Crystals, pure	"		7.14
Strontium—Electrol	grm.		6.19
Tantalium—Pure	"		3.57
Tellurium—Ch. p. sticks	100 grms.		11.90
Powder	"		9.52
Thallium	kg.		23.80
Thorium—Metallic	grm.		7.85
Nitrate 49@50% (N. Y.)	lb.		7.50@8.00
Titanium	grm.		.71
Uranium	"		.48
Nitrate (N. Y.)	oz.		.25
Vanadium—Fused	grm.		1.19
Wolfram—Fused	100 grms.		22.80
Powder, 95@98%	kg.		2.38
Chem. pure	"		7.14
Yttrium	grm.		3.33
Nitrate (N. Y.)	oz.		4.00
Zirconium—Com'l	kg.		119.00
Pure	grm.		.71
Nitrate (N. Y.)	oz.		1.00

MACHINERY FOR SALE.

FOR SALE.

NEW STEEL RAILS,

Spikes and Splice Bars. Also

RELAYING RAILS.

We buy Old Rails—both those only suitable for Scrap and those fit to relay.

ROBINSON & ORR, 419 Wood St., Pittsburgh, Pa.

For $20,000

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

I will supply and erect a new complete **Mining** or **Smelting Plant** for a capacity of **100 tons daily,** comprising Compressor, Drills, Boilers, Engines, Hoist, 1000 feet Wire Cable, Crusher, Water Jacket Furnace, Well or Fore Hearth, Slag and Metal Pots; Blower, Iron Pillars and Cast Floors, Dump Cars, T Rails, Pump, Piping, Belting, to include erection of necessary Rock and Shaft Houses, Smelter and Boiler Houses. 1000 feet trestle for Roast Yard, Electric Light plant for 50 lamps. You supply timber, lumber and shingles. I supply the rest complete in every detail, and will put through the first 100 tons in 24 hours before handing plant over to you.

For each additional 100 tons capacity add another $15,000.

These prices apply to any part of the world. Duty and freights paid by me.

T. M. KIRKWOOD,

SUDBURY,

ONTARIO, CANADA.

FOR SALE.

10,000 IRON PULLEYS, new and good second hand, all sizes, standard goods, **75 to 85%** discount. LEATHER BELTING, all sizes, single and double, straight and fine, good as new. **75%** discount. DYNAMOS, MOTORS, BARGAINS IN MACHINERY, ETC.

R. B. CORBETT, 107 LIBERTY ST., NEW YORK.

New—FOR SALE.—First Class

ore crusher 7 x 10, 8,000 lbs.; two sets crushing rolls, 14 x 20, with heavy countershaft and fly wheel, 13,000 lbs.; engine, 30 H. P. and boiler, 40 H. P., with fixtures complete, 14,000 lbs.; all new, on cars, at four cents lb. cash, STICKNEY, Assignee, Antelope, Idaho.

FOR SALE.

One 22 x 42 in. Wright Corliss Engine. Band wheel, 16 ft. x 36 in.

This engine is in first-class order and will be sold at a very reasonable price.

CRANE CO., Chicago.

FOR SALE.

Powerful Dredging Machine.

Under order of the United States Court for the District of South Carolina.

The endless chain dredge "John Kennedy" has been successfully employed dredging phosphate rock in South Carolina, and recently on the ship channel to Baltimore harbor.

Can dredge to a depth of 42 feet. Is provided with buckets suitable for either rock, clay, sand, gravel, etc. Is a good sea boat, in first-rate order, fully equipped for work. Can be seen at the works of Charles Reeder & Sons, Hughes Street, Baltimore, Md.

For particulars apply to

FRED. BROTHERHOOD, Receiver,

1513 E. North Ave., Baltimore, Md.

LANDS AND MINES FOR SALE.

MISSOURI

Lead-Zinc Mines

Write for particulars and illustrated pamphlet of large dividend paying properties. Address

E. HEDBURG & CO.,

Joplin, Mo., U. S. A.

FOR SALE in Algoma, Ontario, Under Working Option.

1. Gold Location in Michipicoten District.
2. Copper Locations
3. Nickel Mine with 30,000 tons in sight.

Address HEARST & McKAY, Sault Ste Marie, Ontario, Can.

A PAYING MINE

and mill buildings with crushing machinery and power, for $5,000. Has $150,000 worth ore in sight. Will make $61 per day net profit on $15,000 capital. STICKNEY, engineer, Antelope, Idaho.

CRIPPLE CREEK.

FOR SALE—Cyanide Plant; 100 tons daily capacity; in first-class condition to handle Cripple Creek Ores. Plant in full running order with all latest improvements. Address JOHN S. MacBETH Equitable B'dg., Denve , Colo

---

Practical Books

for

Progressive People.

Tersely Told by Writers of Pre-eminent Reputation, and in Convenient Shape for Pocket Use.

PRICE 50 CENTS EACH

THE STORY OF THE STARS. By G. F. CHAMBERS. With 24 Illustrations.

THE STORY OF PRIMITIVE MAN. By EDWARD CLODD. With 88 Illustrations.

THE STORY OF THE PLANTS. By GRANT ALLEN With 49 Illustrations.

THE STORY OF THE EARTH IN PAST AGES. By Prof. H. G. SEELEY. With 40 Illustrations.

THE STORY OF THE SOLAR SYSTEM. By G. F. CHAMBERS. With 28 Illustrations.

THE STORY OF A PIECE OF COAL. By E. A. MARTIN. With 38 Illustrations.

THE STORY OF ELECTRICITY. By J. MUNRO. With 100 Illustrations.

THE STORY OF EXTINCT CIVILIZATIONS OF THE EAST. By R. E. ANDERSON. With Maps.

THE STORY OF THE CHEMICAL ELEMENTS. By M. M. PATTISON MUIR.

THE STORY OF FOREST AND STREAM. By JAMES RODWAY.

THE STORY OF THE WEATHER. By G. F. CHAMBERS. With 40 Illustrations.

THE STORY OF ANIMAL LIFE. By B. LINDSAY. With 40 Illustrations.

THE STORY OF THE EARTH'S ATMOSPHERE. By DOUGLAS ARCHIBALD. With Illustrations.

THE STORY OF THE EARTH'S SURFACE. By Professor H. G. SEELEY. With Illustrations.

The Scientific Publishing Co.,

253 BROADWAY, NEW YORK.

Sulphuric Acid Plants; Five tons daily and up.

Pyrites Plants for Sulphite Pulp Manufacturers

PURE COOL } GAS CHEAP UNIFORM } GAS

F. J. FALDING, Chemical Engineer,
45 Broadway, New York.

SMUGGLER-UNION MINING CO.,

804 Boston Building, Denver Colo.

Mines at Telluride, San Miguel Co., Colorado.

DIRECTORS:

J. A. Porter, President; Richard Pearce, V.-Pres.
James B. Grant, A. Eilers, Wm. A. Bell,
Wm. D. Bishop, Jr.,
A. H. Fowler, Sec'y & Treas.

STEIN & BOERICKE, Ltd.

OFFICE AND WORKS:

1142-1144 Hancock St., Philadelphia, Pa.

MANUFACTURERS OF

Tungsten, Molybdenum and Chromium Metals and Alloys. Tungsten, Molybdenum, Chrome and Uranium Ores.

MISCELLANEOUS WANTS.

Wanted—Tungsten Ore.

Address E. F., ENGINEERING AND MINING JOURNAL.

WESTERN NORTH CAROLINA, ASHEVILLE, HOT SPRINGS AND TRYON.

There is no section in America blessed so lavishly by nature, splendor of its scenery, and health-giving qualities of its climate. Asheville, with its varied attractions, and the beautiful plateau which bears its name, has earned a high reputation,

Hot Springs, N. C., nestled among the loftiest peaks of the Southern Appalachian chain of mountains, where one of the brightest of mountain streams comes dashing and sparkling down and unites itself with the pure waters of the mighty French Broad River, has the Mountain Park Hotel and new bath houses. The property comprises nearly 4,000 acres, and few places in this country offer such attractions as a health and pleasure resort.

Tryon, North Carolina, in the heart of the Blueridge Mountains, near the famous thermal belt, where white frost is unknown, protected from the dangerous coast and assisted by altitude 1,500 feet above the sea, make it the ideal spot for those in search of rest and health, pleasure or recreation; no finer climate can be found. The Southern Railway, with its perfect service, reaches all the attractive resorts. For further information call on or address Alex. S. Thweatt, Eastern Passenger Agent, 271 Broadway.

FREE ADVERTISING.
SEE PAGE 18.

Shaft Sinking Through Quicksands.

The cheapest and most rapid method ever applied for sinking shafts of any size to any depth through quicksands, or in any difficult ground, and for driving tunnels through clays or wet ground. SUCCESS GUARANTEED. Experienced workmen furnished or contracts taken.

C. C. LOVEJOY, care of ENGINEERING AND MINING JOURNAL,
253 Broadway, New York.

TO PIGMENT AND DRY COLOR MANUFACTURERS.

OPEN TO ENGAGEMENT

A Chemist, thoroughly familiar with the manufacture of pigments and dry colors **by the newest methods.** Chromium colors, paris green, ultramarine, etc.; Barium sulphate, chloride, carbonate, blanc fix, lytophon and zinc-baryte. Would join capitalist in establishing a new industry, which would require but a small amount of capital and would yield large profits. Highest references furnished. Address "CHEMICALS MANUFACTURER," ENGINEERING AND MINING JOURNAL.