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

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

SOPHIA BRAEUNLICH, Business Manager.

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* Illustrated.

THE Treasury Department of Mexico has recently ruled that concessions covering less than half a hectare, or about 1¼ acres, although exempted by law from the special mining tax, are subject to the stamp tax at the rate of $5 for the first leaf of the title deed and $0.50 for the second leaf. This tax may not seem large, but it falls on a class little able to pay. Still it must be taken into account that for this sum clear evidence of ownership is given. In many South American countries the tax is greater, while at the same time the applicant for title is compelled to pay numerous other fees, which are not legal, but are nevertheless imposed and collected.

THE question whether the use of copper in a pure form preceded that of bronze or copper alloys may not be of great present importance, but it is of sufficient interest to antiquarians to absorb some of the time of Académie des Sciences at Paris, before which M. BERTHELLOT recently read an elaborate paper on this subject. He has analyzed tools and utensils found in Egypt, Chaldea and Mesopotamia and found them to consist of copper with traces of arsenic and lead, but no tin or zinc. He argues further that the smelting of copper is a comparatively simple process, and that copper ore is found in many places, while tin is comparatively a rare metal, and its use presupposes a certain development of commerce. The Académie indorsed M. BERTHELLOT'S views.

THE art of gem engraving is a very ancient one, and it is a curious fact that the tools used in this work have changed less than any others known except, perhaps, the potter's wheel. In a lecture recently delivered at the Metropolitan Museum, in New York, Professor ROOD, in tracing the history of the art from the early Egyptians, through the Assyrians, to the later Greeks and Romans, stated that the bowstring drill and the disk as used in very early times did not differ materially from the tools in use at the present day, while the corundum point was generally used for hand work. The ancient engravers, however, did not use the lathe, though in other respects they were almost as well equipped as their modern brethren. They certainly succeeded in doing very fine work, some of it having never been surpassed.

MINING in the Transvaal was, at the close of 1892, and at present is, in a very satisfactory condition. The gross yield, as has often been mentioned in these columns, has increased greatly, though, as was natural, the average grade of ore worked has fallen, the introduction of new machinery and new methods having allowed ore of a lower grade to be successfully worked. The veins continue of a profitable grade in depth, and it has been proved that the pyritic ores, which were thought to be refractory, can be successfully treated. At the close of 1892 some 2,035 stamps were in operation, as against 1,540 at the commencement of the year, and the average direct yield was 9·87 pennyweights, against 11·23 pennyweights in 1891. If, however, the production from tailings and concentrates is taken into account, the average for 1892 was 12 pennyweights 13 grains, against 12 pennyweights 5 grains in 1891. Nor has the output been unduly increased by the working of old tailings, as only about one-fourth of last year's production was re-treated. It is thought that coal will be much reduced in price, that labor will become more efficient, if not cheaper, and that a general reduction in cost of materials will take place. These improved conditions, it is believed, will lead to larger profits being earned, and it is thought that the output, which was 1,210,865 ounces in 1892, will be at least 1,600,000 ounces this year.

THE recent tests of armor plates in this country and at Ochta, in Russia, seem to prove that the nickel-steel plate treated by the Harvey process possesses in a high degree the essential qualities of a protective armor—great face-hardness to resist impact and to break up the projectile, and toughness to prevent cracking and itself breaking up under repeated blows. The Annapolis trials last year proved beyond dispute what most naval experts outside of the British Admiralty were ready to admit, that the compound plate would disintegrate and fail under heavy fire, and that only a homogeneous plate could be expected to resist projectiles from guns of the latest patterns. The nickel-steel plate was then brought forward prominently for the first time, and subsequent trials have only increased the confidence felt in it by experts.

The Harvey treatment is still later than the use of nickel, and, though there is still some uncertainty about it, and the methods of its application seem to require some improvement, it is probable that the increased face-hardness of the plate given by it is a distinct gain, which is not made at the expense of any other qualities.

The Ochta trials were comparative and their results were in great part a repetition of those attained at Annapolis a year before. The recent trials at the Indian Head proving ground by our own Navy Department have not been comparative, but have been simply tests made to ascertain whether the plates furnished by contractors would come up to the standard set by the Government. They have, however, served to add something to the knowledge of the qualities of the nickel-steel plate, and the result has been in the main to confirm the first impressions as to its excellence. The trials were very severe, and it is not at all likely that an

equally exacting test would ever be made in actual service, for a shot at 50 ft. range only, giving the striking projectile practically full muzzle velocity on impact, and fired also from a gun supported on a fixed base and placed so as to give a direct blow on the center of the plate, is a contingency extremely unlikely to happen in a naval action.

For the present at least the balance of the long contest between guns and armor seems to be in favor of the latter. There is hardly a reasonable doubt that a 14-in. nickel-steel plate, under any conditions likely to occur in action, will protect a ship from any projectile which can be fired against it, even should the artillerists succeed in reaching with a 10-in. or 12-in. gun the enormous muzzle velocity of 3,300 foot-seconds which has been attained in France with the Canet .3-in. rapid-fire cannon. The only question now, so far as protection is concerned, is the weight of armor which a ship can carry; but there is also the further question whether speed and ability to maneuver may not, after all, be more valuable qualities in a warship than weight of armament and comparative invulnerability. This last is a problem still much discussed by naval authorities, and perhaps not to be settled except by the crucial test of actual battle.

QUICKSILVER MINING IN CALIFORNIA.

Quicksilver mining in California, which began with the discovery of the New Almaden and adjoining mines, and which was stimulated by the discoveries of great bodies of argentiferous ore in Nevada and elsewhere, the reduction of which necessitated the consumption of large quantities of the mobile metal, has been on the decline for many years. The great bonanzas of the New Almaden and the New Idria have been exhausted, and no new mines which can equal their former production have been discovered. In addition the quantity consumed by the reduction of silver ores has decreased, lead smelting, hyposulphite lixiviation and other processes which require no mercury having entered the field and supplanted to a great extent the amalgamation plants, which were the only custom works in early days. Still, the industry is not dead by any means, and strong attention is being paid in California to the working of its minor deposits, which a few years ago were considered of too low grade or too small to be profitable.

The largest annual production of quicksilver in California was 79,396 flasks in 1877, and the highest price, $1.55 per pound, was reached in 1874-75. The price in 1879 declined to 33 cents, the lowest ever reached; it averaged 58·1 cents in 1892.

Exportations to Great Britain, Chili, Peru, Australia and New Zealand, which countries formerly bought large quantities of the quicksilver, have practically ceased, while those to China diminished from 36,958 flasks in 1879 to none during the past year.

Notwithstanding this decreased demand, the production during 1892 was greater than in either 1890 or 1891. It reached 27,993 flasks, as against some 22,300 flasks in each of the two previous years. Of this the greater portion came from four mines—the New Almaden, producing 5,563 flasks; the Napa Consolidated, 5,680 flasks; the Great Western, 5,867 flasks, and the Morabel, formerly the Bradford, 3,208 flasks.

This last named mine is considered a promising one. It was purchased by the late THOMAS BELL, J. B. RANDOL and others in the early part of 1892, and while it has not as yet produced startingly large quantities, it is believed that it will soon be the greatest California producer. New developments are said to have been made in the Guadalupe district, Santa Clara County, in 1892, but these have not been confirmed. The outlook for this industry does not seem to be poor. Of late the market price has been fairly steady and the demand, while limited, is sufficient.

New furnaces, with labor-saving devices, and those for almost perfect fume condensation have allowed the working of extremely low grade ore, and as a consequence many of those mines which formerly proved unprofitable are now attracting attention. There is yet a considerable area of the Coast Range, to which these deposits seem to be confined, in which other bodies may be discovered.

STEEL MAKING IN THE SOUTH.

One of the curious things of our time is the failure on the part of Southern iron makers and Southern capitalists to explore the manufacture of soft steel within their boundaries.

The Henderson Steel Company, of Birmingham, Ala., began work in 1888, but after a fitful life of some three and a half or four years came finally to the end of its existence. It demonstrated the possibility of making good soft steel of Alabama pig iron, and a report made to the Birmingham Chamber of Commerce by a disinterested and competent committee put the cost at $22.75 per ton. Some of the steel was rolled at the Bessemer Rolling Mill, and made into boiler plate of excellent quality. But in spite of all this and in spite of the public interest that was aroused by the successful efforts to use Alabama iron for steel making, the Henderson Steel Company was forced to abandon its project, and the plant was sold. The Jefferson Steel Company succeeded to its estate and equipment, and under the management of ERNST PROCHASKA, formerly of Teplitz, Bohemia, and the Pottstown Iron Company, Pennsylvania, promises to take on a new lease of life.

The Henderson Steel Company claimed to work under the Henderson patents, but without recovery of the pentafluoride of phosphorus and the manufacture of phosphorus. JAMES HENDERSON was unquestionably an able and experienced steel maker, but he hampered himself and his process by the introduction of such nonsense as the recovery of the phosphorus in pig iron as metallic or metalloidal phosphorus, proposing to pass the fumes from the steel furnace into water and thereby cause a decomposition of them into hydrofluoric acid and phosphorus. Whatever may have been the underlying reason of the failure of the Henderson Steel Company, whether lack of capital (as was most probably the case) or lack of sound business management (which certainly operated to some extent) or failure to secure a regular supply of uniform stock, fail it did, and until the Jefferson Steel Company took the plant last fall steel making in Alabama was as dead as Herod. With the exception of certain experiments in Chattanooga with basic steel in the open hearth furnace the only soft steel made in the South was made at the works of the Henderson Steel Company, and of late by its successor, the Jefferson Steel Company. How are we to account for the failure of our Southern friends to take advantage of the basic open-hearth process, and to produce soft steel for boilers, agricultural machinery and tools?

In 1882 the Southern States produced 495,419 tons of pig iron, of which 163,179 tons, or 32·36 per cent., was charcoal iron for car wheels and axles, leaving 332,240 tons of coke iron to go to the foundries and mills. In 1888 they produced 1,011,477 tons of pig iron, of which 163,797 tons, or 16·21 per cent., was charcoal iron, and 847,680 tons coke iron.

In 1892 they produced 1,890,167 tons of pig iron, of which 163,206 tons, or 8·64 per cent., was charcoal iron, and 1,726,961 tons coke iron. In other words during the last ten years their production of charcoal iron, which is used almost entirely for car wheels, axles and other purposes, for which very tough iron is required, has remained stationary, while the output of coke iron has risen from 332,240 tons to 1,726,961 tons. During this period the price of No. 1 F. iron has, on the average, fallen from $25.75 to $15.50 on dock, Philadelphia. During this period also the manufacture of all kinds of steel in the United States rose from 1,736,692 tons to 4,840,972. The basic open-hearth process, inaugurated in 1888, has been developed in Pennsylvania and Ohio to such an extent that the total amount of steel produced by it during the last four years will approximate 500,000 tons.

In view of these facts it would appear that the Southern States have gone quite as far in the direction of producing pig iron only as is prudent. They are now producing pig iron more cheaply than has ever been done in this country, and they have established, beyond question, their ability to compete with Pennsylvania furnaces at Philadelphia and Pittsburg. But this is not enough. They must turn some of their raw material into finished products, and without curtailing the output of pig iron change it into steel. That they are so slow to take hold of processes which have been proved to be successful elsewhere and which have labored under almost the same conditions is not to their credit.

They have a great opportunity before them of supplying an immense region devoted chiefly to agriculture with all kinds of farming implements, as plows, hoes, rakes, shovels, steam engines, wire fencing, cotton ties, and the thousand and one things known generically as iron and steel goods. They are rapidly developing their mining and metallurgical interests, and at the same time buying the iron and steel so necessary in these industries from beyond their borders. Producing nearly 2,000,000 tons of pig iron annually, their output of finished iron goods is inconsiderable, and of steel goods nothing to speak of, except incidentally.

They devote entirely too much of their time and money to producing raw materials, forgetful of the fact that in such is the minimum of profit. We need not here consider the Bessemer steel industry in the South, for with the exception of two companies, the Maryland Steel Company at Sparrow's Point, on the Chesapeake Bay, below Baltimore, and the Ashland Steel Company, at Ashland, Ky., this industry is unknown. There are deposits of Bessemer ore in the South, notably in North Carolina and Tennessee, but for many years to come the chief reliance of the steel maker will of necessity be upon the ordinary basic open-hearth process, or some modification of it, such as the Duplex process.

It is to some basic process that they must look for the outlet to an overcrowded pig iron market, to agricultural machinery, nails, wire, cotton hoops, boiler plate and roofing, not to the blast furnace exclusively—to chops, not to pig.

The developments now in progress on the Mesaba Range will open some eyes that are now persistently closed to the possibilities of districts other than their own, and our Southern neighbors will do well to lay these suggestions to heart.

So much for the pig iron now produced from native ores.

But there is another feature of the case deserving the closest attention, viz., the possibility of importing Bessemer ore from Cuba and manufacturing Bessemer steel at Pensacola or Mobile. This matter is now being

investigated by men who have the money and the skill to bring it to a successful termination. The chief difficulty heretofore curtailing the extension of trade between Cuba, for instance, and the Southern States has been the lack of return cargoes.

Vessels bringing in ore have no guarantee of return freight, and vessels carrying out coal are in the same predicament. But this operates less and less each year. The Export Coal Company of Alabama is now taking to Cuba about 100,000 tons of coal per year, and if these vessels were to return with iron ore the amount so imported would represent about 60,000 tons of pig iron per annum, or 10,000 tons less than the capacity of the Woodward Iron Company, Alabama.

The Maryland Steel Company, previously mentioned, has an annual capacity of 400,000 tons of pig iron, and requires not less than 650,000 tons of ore, all of which it now imports from Spain, Africa and Cuba.

The most favorable outlook for the manufacture of Bessemer steel in the South is in connection with the importation of high grade Bessemer ores, and the utilization of them at deep water. A word to the wise *used* to be sufficient.

NEW PUBLICATIONS.

REVIEW OF ORE DEPOSITS IN VARIOUS COUNTRIES. By Rudolf Keck, Colorado Springs, Colo.; Pamphlet, 31 pages.

This is a pamphlet of only 31 pages, comprising very brief summary descriptions of 47 typical districts of ore deposits, in different parts of the world, together with comments by the compiler, bearing upon theories of their origin. Unfortunately the descriptions are so brief that they are necessarily dogmatic, and often obscure. Certainly they do not permit such a study as would critically test the theories founded upon them. Probably Mr. Keck is well aware of this, and intends his review rather as a guide to research than as the actual material thereof. From this standpoint, it will be useful to students, by calling their attention to subjects which they can pursue more thoroughly elsewhere. Mr. Keck's original material, from his own note-book, has special value. Outside of this, his chief sources of information are Cotta, Groddeck and Sandberger—a somewhat limited range, and not of equal authority throughout. His condemnation of many of the old notions which still linger among mining experts is timely and just; but his wholesale adoption of Sandberger's theories is not warranted by the results of recent discussions and investigations. R. W. R.

THE JOURNAL OF GEOLOGY. A semi-quarterly Magazine of Geology and Related Sciences. Vol. I., No. I; January-February, 1893. Chicago: The University Press. D. C. Heath & Co., Directors. Pages, 112; $3 per year.

The prospectus published in the opening number of this new magazine states that its "immediate editorship will rest with the geological faculty of the University of Chicago, under whose auspices and guarantee it is issued, but its policy will be open and comprehensive." The articles in the number are on the "Pre-Cambrian Rocks of the British Isles," by Sir Archibald Geikie; on "Traces of Glacial Mass in the Trenton Gravels," by W. H. Holmes; "Geology as Part of a College Curriculum," by H. S. Williams; "Nature of the Englacial Drift of the Mississippi Basin," by T. C. Chamberlin; and on "District Glacial Epochs," by Rollin D. Salisbury. There are also several short editorials and some notices of recent publications. The magazine is handsomely printed, and the list of editors and contributors gives good promise for the future.

POOR'S HANDBOOK OF INVESTMENT SECURITIES. Third annual volume. New York: H. V. & H. W. Poor. 986 pages, with maps. Price, $3.50.

This book, like the "Directory of Railroad Officials," is an outgrowth of the older "Poor's Manual," and is intended to supplement and extend the statements given in that book, and at the same time to give a certain class of information needed by investors who do not need the special railroad statistics given in the larger work. The first thing to be noted about the present volume is the increase in size, making it almost double the size of the previous number. This is due partly to the extension of the statements and to the greater number of companies included. The "Handbook" gives statements of United States bonds; of State, county and municipal issues; abstracts, in condensed form, of railroad returns; tables of dividends paid; tables showing times and places of annual meetings; of times and places of payment of coupons; transfer offices; bank statements; ranges of stock and bond values, as fixed by the New York Stock Exchange; and finally statements of miscellaneous corporations. It is chiefly devoted to railroad corporations; 550 of its pages having reference to railroad securities entirely, while State and municipal issues fill 330. The miscellaneous corporations in the lists are nearly all industrial, telegraph, water, and lighting companies; no mining securities are included, except those of some coal companies and a few of the large copper mining companies. While the treatment of railroad issues is very full and in a form likely to be of use to investors, it would seem that a department of mining securities would be a very useful addition to the book.

EL CURSO FORZOSO EN LOS ESTADOS UNIDOS. By Climaso Calderon, Consul General of Colombia to New York. New York: La America Editorial Company. Paper cover. 195 pages

The adoption of paper money by all the civilized governments of modern times has given birth to a vast mass of literature, the greater part of which has been controversial, written to demolish or establish some particular idea. Another part, of more solid and enduring worth, has been disquisitional, being formal attempts to elucidate the politico-economic truths upon which the science of money is based. Still another part has been historical, and to this class the book before us belongs. It is, as the author in his preface states, an exposition of the legal tender issues of the United States during the period of the civil war and the 14 years following to the resumption of specie payments, written for the information of the legislators and economists of Colombia, which of late years has been obliged to resort to the issuance of this kind of money. Mr. Calderon's study of our financial history during these 18 years is both clear and complete. He commences with the condition of the treasury at the beginning of 1861, and follows with the appointment of Salmon P. Chase (to whom he pays high praise) as Secretary of the Treasury, the $150,000,000 loan negotiated by Chase in August, 1861, and the suspension of specie payments which quickly followed. The first legal tenders or greenbacks, of which $500,000,000 were authorized, were issued in March, 1862. Gold went to a premium of 2% at once, but the premium rapidly increased until the metal reached its maximum value, July 11th, 1864, when it sold for 285. The author gives a full account of the fluctuations and the means taken by the government to prevent the depreciation of the legal tenders, after which follows an account of Black Friday, the panic of 1873, the Resumption Act and the various and contradictory decisions of the Supreme Court on the validity of the Legal Tender Act.

In the concluding chapter Mr. Calderon compares the system of the Banks of England and France with our own and shows why it was that during the suspension of specie payments by the former 1797-1819 and by the Bank of France 1870-1877, gold did not go to as great a premium as in the United States.

From this comparison it is deduced that the notes of a great bank, chartered by a strong government and endowed with unusual privileges such as the Bank of England or of France, are liable to less depreciation than are notes issued directly by the government itself. The book is well gotten up, although marred by a number of typographical errors.

Although this book was written for the special information of Colombians, its conciseness of statement and clearness of style will recommend it to all who are so fortunate as to be acquainted with what Carlos V. called "la lengua de Dios."

FINANCIAL REVIEW (ANNUAL). 1893. Commerce, Banking, Investments, New York: Wm B. Dana & Co. In two parts. 276 pages. Illustrated.

This book, which might well be called the annual statistical number of our esteemed contemporary, "Commercial and Financial Chronicle," is replete with valuable information for all those interested in stocks, bonds and other securities, or in the financial history of our country. It opens with a general retrospect of the year 1892, compares the production of the great wealth producing staples in the United States, gives comparative statistics of failures, crops and values, exports of cereals, sales and preemptions of public lands, manufactures, railroad construction and earnings, our foreign commerce, the general money market, and Stock Exchange sales. A monthly review of the year follows, in which is given in detail the various features and events affecting or dominating the market during each month.

Under the caption of Clearings and Speculation are given the monthly bank clearings of the country, and the monthly sales of stocks at the New York Stock Exchange from which it is learned that the total clearings of 1892 exceeded those of 1891 by 9·1%, while the total sales of stocks in 1892 were greater than those of 1891 by 24·5%.

At the New York Stock Exchange the bonds listed amounted to $317,861,500, which is greater than those listed in 1891, but less than those listed in any other year since 1886. The stocks listed amounted to $237,036,105, which is greater than the amount listed in 1891, but less than the amount for any other year since 1885. Under the general head of Banking and Financial are given statistics of the national finances, abstracts of the reports of the Comptroller of the Currency, the Director of the Mint, and the business of the year in England.

The money market is briefly described, and to it are added the weekly quotations for call loans and commercial paper since 1885. The daily rates for London exchange are given for both sight and 60-day drafts from 1880 to 1892, the tables being accompanied by running comments giving the more particular features of change and their causes. The prices for United States and State securities are given for each month from 1860 to 1892, while the prices for railroad stocks and bonds are given for 1888 to 1892.

This part of the book ends with a general review of the principal stock markets of the country and abstracts from the reports of the national banks.

Part II. of this book is devoted mainly to railroads, and is called the "Investors' Supplement of the Commercial and Financial Chronicle." The principal features are the stock and bond tables, in which are given name of road, miles of road, stock and bonds issued and date of issue, and amount outstanding; rate of dividends or interest, when payable and where and by whom, last dividend paid and date when bonds are due. The tables are accompanied by historical notes on the roads, their stocks and bonds, by maps showing the roads and connections and tables of monthly earnings.

A few errors are to be noted in the various tables given, but this is to be expected in a work of its size.

One grave fault to be found with it is the absence of an index, but even so the work is of great value, and must be considered indispensable to the investor.

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 in another page of the Journal.

Vierteljahrshefte zur Statistik des Deutschen Reichs. Jahrgang, 1893. Erstes Heft. Berlin, Germany: issued by the Imperial Statistical Office. Pages, 140.

Bulletin of the Geological Society of America. Volume IV. Extract. Containing the annual address of President C. K. Gilbert on "Continental Problems." Rochester, N. Y. Published by the Society.

Geology of the Eureka District, Nevada. By Arnold Hague. Being Vol. XX. of the United States Geological Survey, J. W. Powell, Director. Published by the Government, Washington, D. C., 1892. Pages, 419. Illustrated and with 13 plates.

The Recent Survey of St. Louis: Its Methods and Results. By B. H. Colby, C. E. Paper read before the Engineers' Club of St. Louis and reprinted from the "Journal of the Association of Engineering Societies." Pages, 40. Illustrated.

Climatology of North Carolina from Records of 1820 to 1892. Compiled at the North Carolina Agricultural Experiment Station; H. B Battle, Ph. D., Director; C. F. von Herrmann, Roscoe Nunn, Meteorologists. Raleigh, N. C. Pages, 184. Illustrated by diagram maps.

Almanaque y Alcance de el Minero Mexicano para el Ano de 1893. Recopilacion de las Nuevas Leyes y Circulares Mineras Expedidas desde el 1° de Julio de 1892, hasta Enero 1°, 1893. Published by "El Minero Mexicano," 1893. Pages, 72. Paper cover, price 50 cents.

Geologic Atlas of the United States. 1. Hawley sheet, Massachusetts; 2. Chattanooga sheet, Tennessee; 3. Kingston sheet, Tennessee; 4. Sacramento sheet, California; 5. Lassen Peak sheet, California. Washington: issued by the United States Geological Survey, Department of the Interior, J. W. Powell, Director.

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

What Shall We Call Aluminum?

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Apropos of the several suggestions which have from time to time appeared in the Engineering and Mining Journal as to a new name for that stubborn metal aluminum, why not reverse alum and call it "mula?" Every mining engineer who has been in Mexico or New Mexico has heard the expression, "Mula! diabolo! carrajo!!" ofttimes doubtless, and will probably see the point and pertinence of the term for so recalcitrant an element.

C.

Deterioration of Copper Wires Under Ground.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In reference to the deterioration of copper wire under ground I recall an experience had many years ago in sinking the Dundee shaft. Iron wire having proved useless as bell or alarm wire by its rapid rusting in the mine water, I got a No. 6 copper wire, but found to my surprise that it began to break in less than six weeks. Thinking the quality of wire deficient, I got the best quality obtainable, but the result was the same. Some six or eight copper wires, some of No. 4 thickness, were successively used, all with the same result, and I was forced to fall back on the fatigue of metals for an explanation.

About this time I made the acquaintance of a man who had been foreman of the boiler shop in the old Philadelphia Navy Yard; knowing that the first United States steam warships had had copper boilers, I asked this man what he knew of them; he said: "I saw several of the copper boilers taken out; they had 'rotted' in a few months' use; I believe it is the sea water."

It would seem that neither electricity, nor mine, nor sea water, is the cause of the deterioration, but that the fatigue of metals must account for it.

WILKES-BARRE, Pa., March, 1893. F. KOERNER.

Meadow Lake Ores and the Chlorination Process.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The subject of the treatment of the Meadow Lake ores in Nevada County, Cal., mentioned in your issue of February 18th, is frequently commented upon by the newspapers of the State.

At intervals, we hear of the difficulty of the treatment of the pyrites of that district, though every expert who ever investigated the subject is aware of the fact that the only trouble with the ores is in their low value.

In 1866 the writer's chlorination works at Meadow Lake treated all the concentrates of the district. The heavily sulphureted concentrates of the California mine, assaying but $7 per ton in gold, were closely worked to assay. The Enterprise concentrates, consisting of arsenical pyrites, were readily handled, but the vein pinching out, like most of the veins in the granite of that district, soon left the works without the necessary supplies for profitable work. The same misfortune befel the U. S. Grant and Mohawk, some of the leading mines of the district. It is doubtful whether works of the magnitude of a barrel chlorination plant, would be able to keep running for any length of time.

The writer has been informed by several metallurgists of national reputation, who investigated the Meadow Lake ore problem, that they could not see there an opening for a prosperous reduction plant of any kind under present circumstances. The barrel chlorination has so far not found a favorable introduction here, because the quantity of concentrates to be found in any one mining district in this State is not sufficient to keep a single barrel in operation.

The Plattner chlorination, as at present conducted, is by no means as expensive a method as your figures appear to indicate. Under favorable conditions, cheap wood and freight rates, not counting interest, insurance and amortization of a capital of $3,000, the working expense does not exceed $5 per ton, and is sometimes not more than $4. than $4.

We also have in California, concentrates from vein matter, encased in black slates or magnesian rocks, which require 175 lbs. of sulphuric acid per ton to satisfy the alumina or magnesia, in addition to the acid necessary for the formation of the needed chlorine—a drawback, which greatly increases the cost of barrel chlorination for such ores.

In conclusion the writer wishes to state that in California we are keenly alive to all real improvements in the methods of treating gold ores. We endeavor to supply ourselves with all the latest literature on the subject, of which none is more appreciated than the Engineering and Mining Journal.

AUBURN, Placer County, Cal., February 26th, 1893. G. F. DEETKEN.

The Russell Process and Pyritic Smelting.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: It seems to me that the eminent gentlemen who compile literature for the Russell Process Company are either grossly ignorant of what the rest of the world is doing, or else they deal with metallurgical subjects in a spirit of uncandidness that one would dislike to find in men of their high standing.

The Russell company, summarizing their claims, declare that "The Russell Process, both metallurgically and economically, occupies the place formerly held by—

"First, The Kiss, Patera, or old Leaching Process.

"Second, Amalgamation of silver and silvre-gold ores.

"Third, Smelting of 'dry' ores and ores averaging not over 15% lead, or such as do not contain sufficient lime or iron to make them desirable as fluxes in smelting."

To the first and second of these claims, justifiable as they may or may not appear, I have nothing to say. But the third I most emphatically deny. I deny that the Russell Process ever has been or ever will be a rival of smelting in the field named. In no case and under no conditions can the Russell Process treat basic ores as cheaply or as efficiently as can the smelting processes. With acid ores I recognize in full its advantages; but even with the most siliceous material it is questionable if the process can always compete with matting, even when silver alone is worked for; and when gold, copper and other metals are concerned it has no chance whatever.

My own acquaintance with the process is but slight. It dates from 1889, in the summer of which year a company of Oregon capitalists erected in Mineral, only one quarter of a mile below the spot where our matting plant stands, a rather complete Russell Process mill, at a cost of $30,000. It was placed in charge of Mr. W. H. Lamb, now of Park City, Utah, who is a most skillful leaching expert, and, as I perceive from the title page of the inevitable pamphlet, a zealous advocate of the Russell Process. Mr. Lamb labored arduously and intelligently through several months, making those endless experimental tests which seem to be the alpha and omega of the process—but labored in vain. The project was a failure, the mill shut down and was sold for a tenth of its cost, for other purposes.

The causes of the failure have been variously stated hereabouts, but, so far as I can see, it was mostly because the process didn't take enough silver out. I am told that the best results reached 76%, but whether this was the extraction or the "apparent" extraction, or simply an "extra" extraction I am unaware.

The ores in question, of which only the more tractable part were or were sought to be worked in the Russell mill have been bought by my firm during the last three years, and successfully treated in matting furnaces, as before set forth in these columns. That we have made it pay when the Russell Process people failed, is a sufficient answer to the assertion that that process occupies the place of smelting. Treating the same ores, we are able to do the work at one-fifth the cost, and save 20% more silver than they claimed to extract. I will say, however, that the high cost of treatment at their works arose largely from faults of construction and design.

It seems to me that the Russell Process Company will do well to confine its attention to silver-bearing quartz, and to leave the treatment of more basic material to more advantageous processes. Their claims as to the successful treatment of basic ores are only relatively true; and their language in reference to other processes in this connection is intolerable. They quote an analysis of the Las Yedras ore (Sinaloa, Mexico) and say "smelting being economically and metallurgically out of the question." This was said of an ore containing silica, 25; calcite, 46; iron, 9·8; sulphur, 12·5; arsenic, 2·5. Instead of being an unsmeltable combination, this ore is in reality the finest smelting product in the world, susceptible of being run down at one operation into a high grade matte, and at less than the cost of the salt which is now used in roasting! And the matte can then be refined and its total silver extracted at an additional cost per ton of original ore, not exceeding the cost of the chemicals now used in the Russell leaching. I base this opinion on the data given in the valuable series of papers by Mr. Rockwell, published in the Engineering and Mining Journal in 1888, entitled "Roasting and Chloridizing at Las Yedras." The Yedras ore is chemically nearly the same as that of an important mine near here, and of which we have treated considerable quantities, the difference being an excess of carbonate of lime in the Mexican ore. This we run down without the use of fluxes, and without admixture of other ore, using 7% coke. Using a furnace of somewhat novel construction, and by peculiar treatment of the blast, etc., we burn off much the larger part of the sulphur and arsenic and slag off the corresponding proportion of the iron and zinc, thus effecting a desirable concentration of the matte and at the same time utilizing the heat of combustion of the elements named. This is pyritic smelting, properly so called, and is a branch of the larger art of matte-smelting.

The waste of silver at Yedras must have been prodigious indeed. Mr. Rockwell mentions months of work wherein the losses by volatilization alone varied from 17 to 25%, the best work attainable in his time, resulting in an average loss of 10% from that cause. The Russell people have got it down to 6 to 7%; the total losses now footing up about 19%.

The Russell Process has undoubtedly been a great improvement over the old leaching, but it is a great wonder that the management tolerate any lixiviation methods whatever. I hold the same opinion concerning the Aspen works, which run on similar ore, and Marsac workings. I do not know how they compare with other processes.

MINERAL, Ida., Feb. 26, 1893. HERBERT LANG.

DRAINING DIP WORKINGS.

By H. F. Bulman.

Mr. H. F. Bulman, in the number of the "Journal of the British Society of Mining Students," for January, 1893, describes briefly the six principal methods used for draining mines worked on the dip.

The Borehole system is used at the Broomside Colliery, near Durham, where the Low main seam is worked about 78 ft. above the Hutton seam goaf. When the holes become choked with stone, etc., they are freed by a charge of dynamite.

The Water-tub system is used at the Killingworth Colliery, Northumberland, in working the High main seam toward the dip of the shafts. The tubs were made of iron and held about 140 gallons each. Six were run in a set, with a stone-laden tub behind to force them into the water. They were filled partly through a flap valve, and partly by men with scoops, an antiquated and costly method.

During a 12-hour shift 36 trips could be made, and some 23,000 tons of water delivered at the bank.

At Byer Moor Colliery, in the Busty Seam, the Syphon system is used, and, indeed, so successfully that there are now five of them working over a distance of 3,557 yds. The air valve used is quite ingenious, as will appear from the following sketch.

At A is a flat circular leather disc valve. B is a pail or old tin can fixed on the top of pipe C. B and C are filled with water and keep the valve closed when the syphon is running. When the syphon is being filled the pressure of the air against the underside of the valve opens it, and the accumulating air is thus allowed to escape through C and B.

The greatest height through which any one of the syphons at Byer Moor is working is 21 ft. The length of this syphon is 1,275 ft., the pipe is of 4-in. diameter, and there are three right angle turns in it. The fall is 27 ft., so that there is a pressure of 2·59 lbs. per sq. inch due to the 6 ft. head. The delivery of the water, just after filling, is 40 gallons per minute. The syphon is filled by means of an Evans syphon force pump.

Another of the Byer Moor Colliery syphons drains two sumps, one 2,766 ft., and the other 1,887 ft. from the delivery point. It is 4 in. in diameter, lifts 14 ft., has a fall of 35 ft., gives a working pressure of 9 lbs. per sq. inch and discharges 35 gallons per minute.

The three other syphons at Byer Moor discharge into the shaft sump, the two just described discharging upon the surface. Near the bottom of the shaft, which is 483 ft. deep, is a direct-acting steam pumping engine, with two double-acting 6-in. rams of 4 ft. stroke. This pump will deliver to the surface 14,000 gallons per hour, and all of this water is brought to the sump by the three syphons. The longest syphon has three branches, the main trunk is 996 ft. long and 8 in. diameter, and of the two branches one is 2,310 ft. and the other 1,227 ft. long, both of 4 in. diameter. The greatest lift is about 8 ft.

At the Chester South Moor Colliery, County Durham, a syphon is lifting water 26 ft., which is certainly an excellent result. The line is 1,800 ft. long, and the diameter of the pipe is 6 in.

A hydraulic pump was used at Burnopfield Colliery, County Durham, where it superseded 4 horse crank pumps employing 16 horses and 12 men. The depth of the shaft at the main coal seam is 300 ft. The water was brought from the surface in a 4-in. pipe, the driving ram was of 6-in. diameter, and the pumping ram 14 in., with a stroke of 3 ft. 10 in. The length of the suction pipes was 297 ft., and of the delivery pipes 378 ft., both being of 6 in. diameter. The lift was about 14 ft., all on the suction side, and the pump worked easily at 13 strokes per minute, the theoretical discharge being 25 gallons per stroke. This pump was afterward removed to the Busty Seam, 240 ft. lower. It was placed inbye 2,190 ft. from the shaft, and the 4-in. driving pipes were fed from a cistern on the Main Coal Seam level, i. e., 240 ft. above the pump. The pump now draws from two sumps, one 297 ft. away and 7 ft. fall, with an additional 7 ft. to the bottom of the sump, and the other 858 ft. away, with about the same fall. The delivery pipes extend 1,230 ft. from the pump and have a rise of 12 ft., and 6-in. pipes were used at first for both suction and delivery. It was found, however, that the engine could not be made to go more than 7 strokes a minute, even when the head of water driving it was increased to a pressure of 135 lbs. per square inch. As this was not sufficient to drain the district, a second line of 6-in. delivery pipes has recently been laid. It will now go 9 strokes with a driving pressure of 104 lbs. per square inch, as shown by a pressure gauge fixed at the pump. The pressure varies from 100 to 105 lbs. during the stroke. In the Main Coal Seam under a driving pressure of 130 lbs., it went 13 strokes. The difference shows the advantage of having ample area in suction and delivery pipes.

As a motive power for driving pumps at a considerable distance from the shaft, oil engines are proving themselves valuable. A 5-H. P. Priestman's oil engine has been at constant work driving a Warner's treble-ram pump, 6 in. rams, 9 in. stroke, at Burnopfield Colliery during the last nine months. It was kept going all through the recent strike, and without it the district where it is placed would have been drowned. It is 4,380 ft. from the shaft, in the Busty Seam, which is quite free from gas, and it is placed in a short passage or holing, connecting the intake and return airways for that district of workings.

A brick stopping with a regulator in it divides the engine-house from the return. The exhaust gases are carried from the engine through the stopping by a pipe 1¾ in. inside diameter, and blow off into the return. From 9,000 to 10,000 cu. ft. of air per minute are passing in this return, which is 38 sq. ft. in area. The increase in temperature due to the exhaust gases is not perceptible. The theoretical capacity of the pump is 2·75 gallons a revolution; allowing 15% off this, leaves 2·34, which, multiplied by 50, gives 117 gallons a minute. This has been confirmed by measurement of the water delivered. The length of the delivery pipes is about 3,900 ft., and they are 6 in. in diameter; pressure at pump 18 lbs. per square inch. The pump is drawing from three sumps, the length of suction pipes being about 690 ft., and the vertical lift 12 ft. The useful work done, therefore, when the pump is driven at this speed, is 117 gallons of water lifted 52 ft. per minute, or 1·8 H. P. During 12 hours out of the 24, when the hewers are at work, the pump is kept going constantly. It has stood for as long as 1½ hours, and been restarted, without the vaporizing chamber needing to be reheated. White Rose petroleum is used, costing 18 cts. per gallon. On an average 15 gallons are consumed in the 24 hours, making the cost on this account $2.70 per 24 hours. The battery, which generates the electric spark for igniting the explosive mixture in the cylinder, has one cell containing two carbon plates and one zinc, and a solution, each pint of which contains 5½ oz. of chromic and 3½ oz. of sulphuric acid. The average interval for recharging the cells is 21 hours. The cost of the battery solution and the zinc plates is about 32 cents per 24 hours. The solution costs 24 cents a gallon, and the zinc plates $2.40 a dozen. The induction coil has not given entire satisfaction. A curious event in the history of this engine is that it worked once for 24 hours without the battery. The explanation seems to be that the heat retained in that end of the cylinder, especially about the platinum wires and porcelain plug, which are poor conductors, was sufficient to ignite the mixture of oil and air at the moment of its maximum compression. The temperature of the oil spray and air in the vaporizer of Priestman's engine is about 300° F. The engine is taken to pieces and cleaned once a fortnight, and this requires the labor of two men for 8 hours.

The only accident that has occurred was the bursting of the water jacket, due to the carelessness of an attendant in opening the wrong taps. The entire pressure of the circulating pump was brought upon the water jacket casing and the strain was too great for it.

The first cost of the engine was about $1,000; of the pump, $378, and of the engine house $107, making the total cost $1,485. One man is required for each shift of 8 hours, and is paid 82 cents, making the total daily cost of attendance $2.46 per day of 24 hours. Adding the costs of oil, $2.70, and battery materials 32 cts., makes the cost per 24 hours under these heads $5.48.

Before this engine was put in, there were two horse crank pumps kept constantly going, and a rope pump driven by a short endless rope off the tail wheel of a main and tail rope engine plane. The crank pumps were both of the same pattern, having three rams each 6 in. in

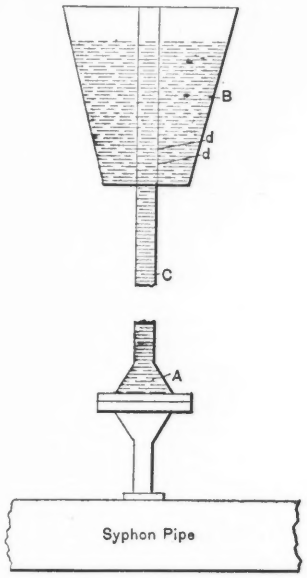


FIG. 1.

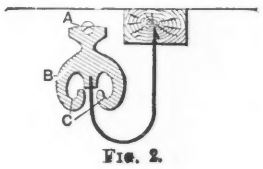


FIG. 2.

diameter, connected to a 3-throw crank shaft, carrying a 9-in. bevel wheel, gearing into a 4-ft. wheel, fixed on a vertical shaft, to which is attached a horizontal wooden arm about 9 ft. long, to the end of which the horse is yoked. The ratio of the motion of the two wheels is 1 to 5·33, or while the big driving wheel makes one revolution, the small bevel wheel on the crank shaft makes five revolutions and four teeth over. Ten horses and six men were employed in connection with these two pumps. The rope pump has a ram 8 in. diameter and 3 ft. stroke, and is double acting. The driving pulley is 5 ft. in diameter, and its shaft carries a 21-in. pinion wheel gearing into a 43-in. spur wheel on the crank shaft. Since the oil engine started, the rope pump and the two crank pumps have not been required, and 10 horses and 9 men have been replaced by 3 men.

Electricity in its application to pumping machinery is attracting much attention, and at the Andrews House Colliery, County Durham, is a good instance of the installment of a plant for driving pumps inbye. This colliery is noted for the large quantity of water that must be handled; at one time 40 tons of water were raised for each ton of coal. The electrical plant was put up in June, 1889, and has been enlarged and extended. A dynamo, with armature 10×10 in., shunt wound, was located about 300 ft. from the shaft-mouth, and connected, on the third motion, through two leather belts and a counter shaft, ratio 24 to 1. The engine has one cylinder 12 in. diameter and 24 in. stroke. At 980 revolutions the dynamo gave 17 amperes at 245 volts, equivalent to 5·5 H. P. The motor was in the workings 4,800 ft. from the dynamo, and was of 1·8 H. P., 175 volts, 10 amperes, 850 revolutions, 10×4-in. armature, series wound. It was connected by means of a leather link belt, 4 in. wide, with a treble ram pump, to lift 30 gallons a minute 44 ft. high, the rams being of 3 in. diameter and 7½ in. stroke. The ratio of speed between the motor shaft and the crank shaft of the pump was 15 to 1.

The cable, as first put in, was of 7 copper wires 18 W. G., insulated with the Fowler-Waring patent lead covering, which has proven very satisfactory. For the return current, old rope was at first and is still

used nearly all the way, and is allowed to lie on the ground, or is attached roughly to the side of the way by nails. Only 250 yds. of the return conductor is insulated cable. A test gave the total resistance of the cable as 5 ohms; that of the 4,800 ft. lead cable may be reckoned at 3·05 ohms, and of the 750 ft. return cable 0·47 ohm, leaving 1·48 ohms as the resistance of the 1,350 yds. of old rope. The first motor and pump replaced a horse crank pump, which was employing 8 horses, and then could not drain the feeder of water. As the water increased, it was soon found necessary to add a second motor and pump. This motor is of the same size and type as the other, and the pump has three rams 3 in. diameter by 8½ in. stroke, the ratio of speed between the motor shaft and crank shaft of the pump being 17 to 1. A test showed that the motors utilized 34% of the power given by the driving engine. The total cost of the installation, including dynamo, two motors, two pumps, cable, and labor of fixing, was about $2,450. The cable cost $385 a mile. More recently it was found that the two motors and pumps were not sufficient to cope with the water, which had more than doubled in quantity. A larger dynamo was therefore got, armature 12 × 12 in., compound wound, yielding at its normal speed 38 amperes at 270 volts, but it has been run up to 50 amperes and 300 volts. It is connected with the same driving engine, on the second motion, by a leather link belt, the ratio of speed being 1 to 11. The field of the old dynamo was rewound, and it was utilized as a motor to drive a third pump, at a distance of about 6,000 ft. from the dynamo. This pump has three rams 5 in. diameter, and lifts 60 gallons a minute a height of 84 ft. A new cable was got. For 250 yds. it is 19-18, i. e., 19 wires of 18 W. G., and for the rest of the distance to the first motor there are two cables, one 7-18 and the other 7-16; from the first motor to the second, which is 900 ft. farther inbye, the cable is 7 16, and from the second motor to the third 7-18.

The sketch, Fig. 2, shows the form of support used for the insulated cable. A is the cable, which is fastened by wire to the earthenware insulator B. The cups C C are intended for holding a little oil, so as to break a continuous surface of moisture, which might allow the current to get to earth. D is an iron rod fixed into a timber balk or plug in the roof or side. Old ropes are still used for the return current, as before. Considering the resistance in the pipes, the average work done by the pumps is as follows: 1st, 0·57 H. P.; 2d, 0·89 H. P.; 3d, 1·78 H. P.; a total of 3·24 H. P. The normal current required at the third or farthest inbye motor is 19 amperes and 172 volts. Between the motor and the dynamo there is a loss of electromotive force of 100 volts. The efficiency of transmission of the present plant has been calculated to be 45%, as follows: Brake H. P. of driving engine at 75 revolutions, 15·50 H. P.; the dynamo gives 85% of this = 13·17; the cables give 69% = 9·08; the motors give 80% = 7·27; the total being, 45·02%. The pumps are kept at work constantly, resting only 40 to 60 minutes in 24 hours, and one man attends to them, the motors and the pumps.

The speed of the motors is regulated by resistance coils in the usual manner.

This part of the colliery would have been drowned out during the long strike of the past year had it not been for these pumps. After three years' experience they have been found to give very little trouble, to have cost next to nothing for repairs, and to have been very satisfactory.

Mr. Bulman's article should attract attention, especially that portion of it which deals with electrical pumps. There are collieries in this country which have large quantities of water to handle, and no end of trouble with pumps of the ordinary sort.

Great Irrigation Scheme.—A dispatch from Los Angeles, Cal., says that plans have been matured for one of the greatest irrigation schemes ever undertaken in the United States, the result of which will be the reclamation of a large portion of the Mohave desert. Representatives of Minnesota capitalists have obtained from the Hesperia Land & Water company an option on the water right and dam site at Victoria narrows, on the Southern California railway, about 50 miles north of San Bernardino. Here, where high granite precipices approach each other, a great dam will be built, 170 ft. high and 75 to 150 ft. long, blocking the current of the Mohave River and forming a great lake which, it is estimated, will irrigate 250,000 acres of government land open to settlers in the usual way. The cost of the work is estimated at $1,500,000.

THE GENERAL ARRANGEMENT OF A LEAD SMELTING PLANT.*

In laying out a smelting plant the principal aim must be to simplify as much as possible the handling of materials. This is done in two ways: First, by utilizing every possible opportunity to discharge the materials by gravity into and from the truck, when transported from one place to another; second, by making the runway as short as possible without too much crowding of apparatus, which must be avoided on the all-important score of necessary ventilation, and also to give room for moving freely about.

If there is a good natural fall, the arrangement will be about as follows: Taking the furnace floor as base-line there will be on one side the slag-dump with a fall of 20 ft. or more; on the other the furnace, reaching to the feed floor 16 ft. or more above. The roasting furnaces will be on the third level if the ore is all to be roasted; otherwise at the height of the feed floor. Next comes the track from which the crushed ore is discharged into the hoppers of the roasters, 8 ft. or more above the roaster floor and below the discharge of the sampling mill, through which most of the ores that come to the smelter pass. It will be the level of the ore yard and the storage place for fluxes and fuels.

The precise way in which the floors are placed will vary with the configuration of the ground, as it is necessary not only to have the right fall, but also convenient grades for bringing in the materials and carrying away the products. The situation of the machinery for driving the blowers, elevators, and dynamos, and that of the pumps and of the machine and blacksmith shops, also varies, although it is usually on the furnace floor. The machinery for crushing is all found in the sampling department. The steam is usually all furnished from one set of boilers. The office and laboratory are ordinarily near the ore yard.

The general arrangement of the works of the Globe Smelting & Refining Company, at Denver, Colo., as planned by the superintendent, Dr. M. W. Iles, is based on the following scheme: If two intersecting lines are taken, running east and west and north and south, the ground-level will be represented by the southeast and southwest fields, containing respectively the furnaces facing south in a row, and the boilers and machinery for blowing, lighting, etc. The upper fields will show

Fig. 80

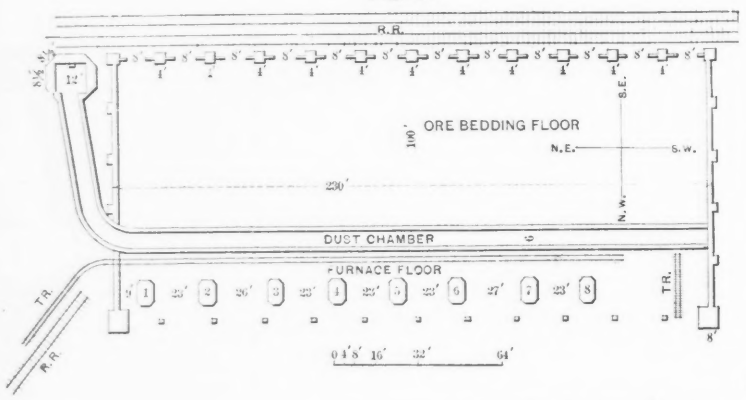
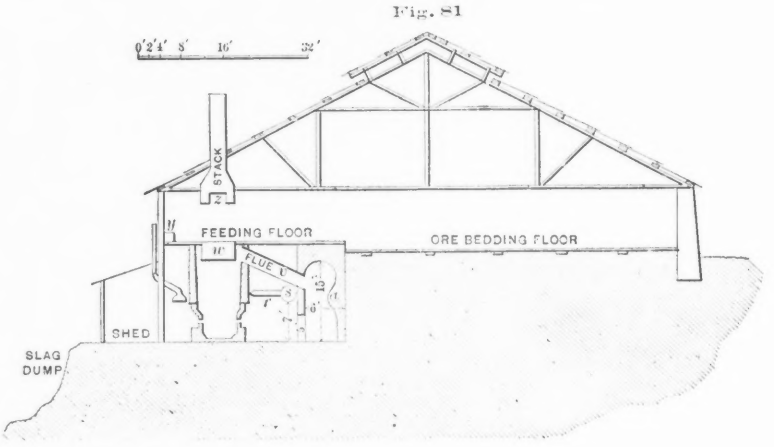


Fig. 81



OMAHA & GRANT SMELTING WORKS, DENVER, COLORADO.

in the northeast field the calcining furnaces, and in the northwest field the sampling department, on the level of the feed floor, the only other level. Two sets of tracks on the upper level, running east and west, bring in ore, flux, and fuel on either side of the sampling and calcining departments; another track on the furnace floor takes away the base bullion produced. An inclined elevator running north and south brings the foul slag, matte, and fluedust from the furnace floor to an elevated track between the calcining and sampling departments and dumps the three products in the places where they are to be further treated, i. e., the slag near the ore beds, the matte near the sampling mill to be crushed before roasting, and the fluedust near the fusing furnaces where it is to be slagged.

Figs. 80 and 81 represent the general arrangement of the Grant & Omaha Smelting & Refining Company's works at Denver, Colo. A few changes in detail have been made, but the general outline is correct. This department corresponds to that one of the Globe Works represented in the southeast field just referred to, and is similar in construction. In these figures 1-8 are the blast furnaces; r the bustle-pipe; s the induction pipe; v the flue carrying fluedust from the blast furnace into the dust chamber; w the sheet iron curtain through which the charges are fed into the furnace; y elevated tramway for the fuel trucks; R R broad-gauge track on feed floor on which ore and fluxes arrive; T R narrow-gauge track on furnace floor delivering the base bullion to the broad-gauge track R R; T R' tramway for raising slag, etc.

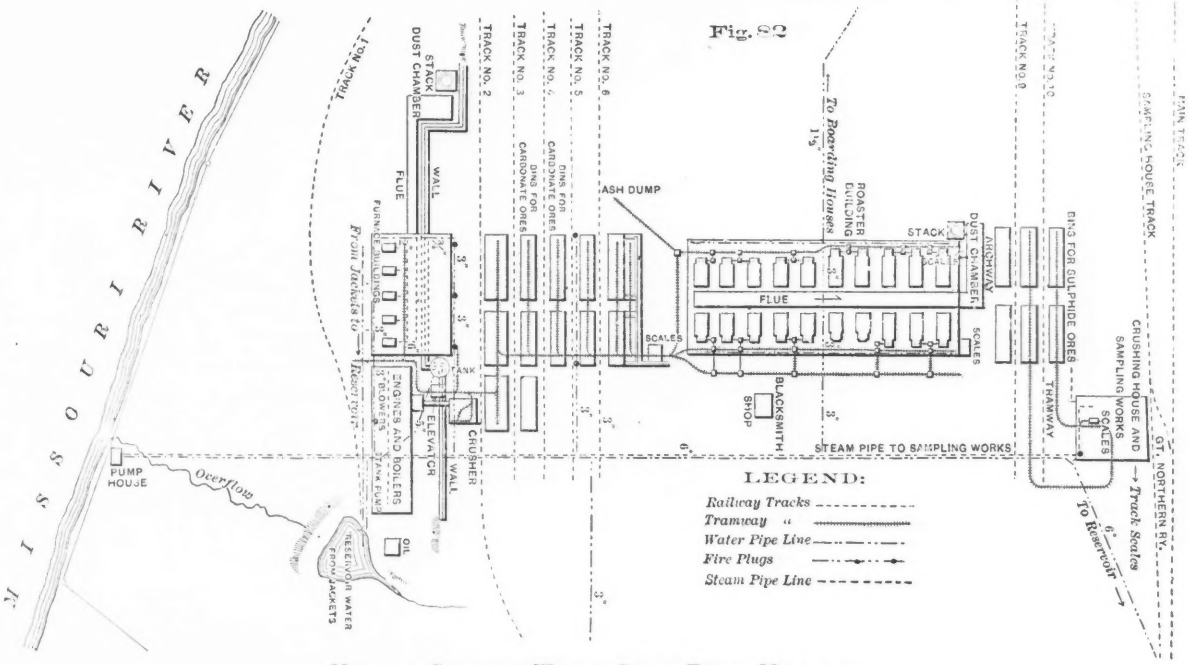
To be noted especially is the large ore-bedding floor. It is the practice to make two large ore beds, each occupying nearly one-half of the floor, about 8 ft. high and holding about 3,000 tons of ore. All the furnaces receive their ore from one bed, and while this is being consumed, the other bed is made. Another feature not to be overlooked is the position of the fronts of the furnaces in regard to the points of the compass. Facing northwest they are as much as possible in the shade, an important consideration in hot weather. The sheet

* From the "Metallurgy of Lead," by Prof. H. O. Hofman. Copyrighted by the Scientific Publishing Company, New York.

iron hood z, placed in front of each furnace to carry off the fumes that arise on tapping the slag, never did its work satisfactorily. The hood now ends in a horizontal pipe, which either terminates in the dust-chamber or in a galvanized iron pipe, common to a number of furnaces, and connected with a fan which sucks off the fumes and discharges them into the open air. Sheet-iron plates hung on either side of the hood prevent the draught on the furnace floor from carrying off the fumes into the building before they can be taken away by the hood.

The works of the Montana Smelting Company, at Great Falls, Mont., planned by Mr. A. Eilers, are shown in plan in Fig. 82. Their general arrangement differs very much from that of the two works previously discussed. In the latter the longest extension is parallel with the row of furnaces; at the Montana works this is reversed. A striking feature is the extensive roasting plant with its separate ore yard. The study of the plans will show that great attention has been given to the handling and storing of large amounts of ore. The loaded cars, arriving on the main track, are weighed on track-scales ,and then switched off on side tracks, which lead to the crushing house and sampling works, to the bins for sulphide ores (tracks 9 and 10), and to the bins for carbonate ores (tracks 2-6). At the sampling works all ores requiring crushing are received, and the sulphide bins are filled with concentrates, which are sampled by fractional selection while they are being unloaded. The lower bins are for ores, sampled in the same way, that go straight to the blast-furnace. Track No. 1 brings the coal for the boilers and takes the base bullion produced in the blast-furnaces. The crushing house and sampling mill, which is fitted up with the necessary machinery for crushing, sampling, and grinding, delivers the sulphide ores over a tramway to their respective bins.

In the roaster building is room for twenty calcining furnaces and fusing furnaces. They deliver their gases into two parallel flues running along the center of the building, Fig. 82. These are built one



MONTANA SMELTING WORKS, GREAT FALLS, MONTANA.

against the other and are combined into one main flue after they have received the gases of the single furnaces. This passes out of the building and terminates in a series of dust chambers connected with the stack by a small flue. The tramways are for carrying ore, fuel, and ashes. The floor of the roaster building is on the same level as the top of the lower ore bins; the roasted ore can thus be easily discharged into them.

The blast-furnace building has three floors instead of two, as is usual. The upper or ore-bedding floor is on the same level as the bottom of the bins for carbonate ores. From the beds made on it the ore mixture is dumped on the feed floor near the single furnaces, where the charges are made up. The fluxes, arriving on track No. 2, are passed through the crusher, if necessary; the fuels arrive on the same track. On the furnace floor is room for five blast-furnaces. The furnaces face toward the river, where the ground is high and furnishes an ample slag dump. The furnace gases pass through a wide flue back of the furnaces, leading into a series of dust chambers, which are connected with the stack. The ventilation of the furnace floor is the one strongly recommended by Eilers. It consists in allowing the feed floor to extend only to the front of the furnaces and closing it off from the entire front part of the building by a wooden partition, which slants backward to the ridge-pole of the roof. Thus a hood as long as the furnace building, and having a width of about 12 ft., reaches from the level of the feed floor to the ventilator and draws off all the vapors and smoke from the tap-hole, the slag-pot, and the lead-well. A similar arrangement at the smelting works in Clausthal, Prussia, was very efficacious in removing the danger of lead poisoning, which had previously been a common thing.

Next to the furnace room are placed the boilers, engines, blowers, etc. The drawing, Fig. 82, shows the blacksmith shop, the pump-house, the water pipes and fire-plugs, the water-tank and lower reservoir, which receives the overflow of the jackets, but not the upper reservoir.

VARIATIONS IN THE MILLING OF GOLD ORES.—IV. OTAGO, NEW ZEALAND.

Written for the Engineering and Mining Journal, by T. A. Rickard.

(*Concluded from page* 223)

The two most striking features of the method of treatment are—first, that no mercury is used in the mortar box, or, indeed, in the mill proper, its use being confined to the after-treatment; and, secondly, that the gold saving is effected by gravity alone. This system is borrowed for the most part from the mills of Clunes, Victoria, and was by them in turn derived from those of Nagyag and Verospotak, in Hungary. It will be allowed that the more simple a mill treatment is, the better, because it is also usually cheaper. Another milling axiom is that the treatment should vary according to the nature of the ore. Here if the methods employed are elementary the character of the millstuff is no less strikingly simple. Whether the mill succeeds in the extraction of a proper percentage of the value in the ore is then the question. In this case repeated assays of the tailings from the Phoenix mill prove that excellent work is being done. The composition and character of the ore justify the entire replacement of the ordinary copper plates by blankets and the successful extraction confirms this.

In milling, as in mining, we are apt to generalize somewhat hastily, and the good work done by his mill has made the manager of the Phoenix, to whom I am indebted for courtesies received, an enthusiastic advocate of blankets and an equally pronounced enemy of amalgamating plates. He communicated to me the following results of an experiment carried out at his mill: Two five-stamp batteries were supplied with 80 tons each of the same kind of ore; No. 1 battery was provided with mercury inside the coffer or mortar box, with copper amalgamating tables outside, with mercury wells, and finally two rows of blankets. No. 2 battery was supplied with no mercury and was supplemented by blankets alone. The results of the test showed that 8 oz. (or 2 dwts. per ton) more were obtained by No. 2 than by No. 1.

In condemning copper plates the manager equally objects to the use of mercury in the rest of the mill, and would confine its employment to the final collection of the gold in the blanket washings. As a case in point and to confirm the correctness of his ideas, he instanced the Invincible mill, on the other side of the same range of mountains, where the gold saving was done by the mercury in the battery itself, by wells, by amalgamating tables and lastly by blankets. On ceasing to add mercury to the ore in the mortar box it was found that more gold was saved.

The two instances, at the Phoenix mill and at the Invincible, merit careful examination. Take the second case first. It so happened that I had visited the Invincible mill, though it was then idle. It seems no wonder to me that the addition of mercury to the ore when in the mortar box did not improve the gold saving—that it indeed caused a loss; for the mortar boxes are merely square iron boxes in no way modified to do the particular work required of them. The explanation of the results above quoted is to be found in the fact that the mortars were not designed of a shape adapting them for amalgamation inside, and there is no opportunity given to the amalgam to collect out of reach of the falling stamps, but on the contrary the quicksilver added is subjected to a violent agitation which causes it to be floured; that is, broken up into a myriad of small globules. These last are readily borne away by the water, and, escaping with the tailings, also take with them a certain amount of gold with which they may have come in contact.

At the Phoenix mill the experiment quoted is vitiated in a similar way. You cannot make a mortar box a successful amalgamating machine by the mere addition of quicksilver. The batteries of this mill are rectangular in section, with vertical ends and sides, and are in no

way adapted for inside amalgamation. To make a fair comparison between the effectiveness of amalgamation as against blanket saving, it is necessary to have the two types of batteries, one roomy and of particular shape, the other narrow and severely rectangular, whose construction has kept in view their suitability to the two modes of milling.

But there is no suggestion intended to be made that blankets could be advantageously replaced at the Phoenix mill by amalgamating plates. Different ores require different modes of treatment. Generalizations are always dangerous. Now, if blankets will arrest your gold, it is obviously not advisable to use an expensive chemical like quicksilver or to employ an apparatus so troublesome as copper amalgamating plates. Here at the Phoenix the mode of milling is of unusual simplicity, but it is suited to the ore whose gold contents it is intended to extract; and in saying that, one has made the best commendation of any particular system of treatment.

Passing on to another mill, the Premier, at Macetown, is a much smaller plant, but is engaged in the treatment of a somewhat similar ore by slightly modified methods. The mill consists of 10 heads, weighing 750 lbs. each. The speed varies from 75 to 80 drops per minute. The height of the drop has a maximum of 9 and a minimum of 6 in., according to the hardness of the millstuff. The issue or depth of discharge averages 6½ in., from 6 in. when the dies are new to 7 in. when they become worn down. The depth is regulated by the insertion of a blind or blank piece of sheet iron inside the screen frame which increases the issue at the start when fresh dies have been placed in position. As the dies wear down, a smaller similar piece is inserted and finally the full depth of the screen is utilized. The capacity of the mill is 65 to 70 tons per week of six working days. The grating or screen is of round punched Russia iron having 180 holes per square inch. The bullion is 949 fine, and the amalgam yields on retorting 30 to 38%.

The gold saving is done by the mortar box to which mercury is added, by the copper plates on the tables outside, by wells, and finally by blankets, supplemented by a Berdan pan.

There is no rock breaker in use; the feeding of the batteries is done by hand. The mortars of the two 5-head batteries are of different patterns. One is more roomy than the other, and, therefore, discharges the pulp more slowly. Seeing that amalgamation inside the mortar box is desired, the millman is right in preferring the wider coffer, since it gives more shelter to the particles of gold and mercury, and thereby better favors the amalgamation. On examination I found, as was to be expected, that the pulp issuing from the wider mortar was finer than that of the other, though the same kind of screen was used in both.

Contrary to the usual practice the blankets precede the copper plates. On being discharged from the battery, the pulp has a drop of 22 in. before it falls upon the first row of blankets. This drop serves no purpose except that of spreading the material over the surface of the blanket tables. These last are 12 ft. long and 4 ft. 3 in. wide, divided into three longitudinal partitions. They slope 1½ in. per foot. The blankets succeed each other in three equal lengths. The first, or top, row is washed every hour, the second every alternate, and the third every third hour. Then follow the copper plate amalgamating tables, 9 ft. long by 4 ft. wide. The total length is subdivided by 5 wells, one each at the top and bottom, and three others at equal distances between. Of the five, three only are supplied with mercury. They are 3 in. wide and only ½ in. deep.

The residues from the blankets are shoveled from one tub into a second, from which they are fed by a running stream of water into a Berdan pan of 4 ft. diameter. Instead of the ordinary bail, a suspended muller, called the "drag," placed at one side of the pan, does the grinding. This modification keeps the grinding and amalgamation separate, thereby preventing unnecessary flouring of the mercury.

A copper plate, 4 ft. 8 in. by 2 ft., is placed below the Berdan with the view of arresting any amalgam escaping in the slimes. At the lower end of the plate there is also a mercury well. The Berdan makes one revolution for every three drops of a stamp; that is, 25 revolutions per minute, when the average speed of 75 drops per minute is being maintained.

Of the total amount of amalgam obtained, 60% is found inside the mortar and 33% in the blanket washings. The copper tables save the remaining 7%. It was found that by using copper plates below the blankets as against a fourth row of blankets, about 5% more amalgam was obtained. This last observation is of interest as proving what might otherwise be inferred, namely, that blankets are particulary suited to the saving of coarse gold just as plates are particularly adapted to the arresting of fine gold. The third mill on the list is a comparatively new machine and is of American design. It is to be regretted that the irregular yield of the Nenthorn mines has prevented any reliable tests being made with the view of comparing it with the older plants.

It will be noticed that at none of these mills is there any attempt to concentrate the sulphide minerals. As a rule, the Phoenix being a notable exception, the pyrites of the Otago lodes yield a very good grade of concentrates. There is, however, no chlorination or smelting plant in the province, and any concentrates obtained have to be shipped to Australia for treatment at a cost and delay proportionate to the distance. That fact goes far to explain the neglect of this part of the milling.

Before concluding it will be well to glance briefly once more at the two older mills. Both the Phoenix and Premier lodes carry ore the gold of which is coarse and free. This explains the comparatively crude and very simple method of treatment. Under such favorable conditions blankets are very effectual contrivances for arresting the gold. This system of gold saving is of very early origin. It was used in America before the discovery of gold in California. The mining districts of the Sierra Nevada borrowed it from the miners of Georgia, and they in turn owed it to those of Verospotak and Nagyag, in Hungary. It came back eastward when the discovery of the Gregory diggings started the mining industry of Colorado. It was derived by the millman of Otago from the mills of Clunes, in Victoria, which, like those of the United States, borrowed it from Europe.

Blankets mark the infancy of milling and belong to the Gossan stage of mining. They can only survive those changes in the ore which accompany the increased depth of the mines when that ore remains, as rarely happens, unaccompanied by much pyrites, and that pyrites not too closely associated with the gold. It will be noted that the Premier mill uses less water than the Phoenix, due to the fact that the blankets of the latter have a less gradient and a larger surface. At the Premier mercury is added to the ore in the battery, while at the Phoenix this is not done. The latter is probably the more correct practice. The gold is coarse and free, and other things being equal when a large percentage can be arrested by the blankets it is probable that the still coarser particles which remain inside the battery would be caught there by reason of their own gravity and without the aid of mercury. In both mills the final extraction of the gold from the blanket washings is roundabout and clumsy. It should be possible to treat the residues without so much manipulation.

In conclusion, while it may appear that the mills of Otago have but little that can be advantageously imitated by those of Colorado or California, for the sufficient reason that they are adapted to the treatment of an ore of a very simple character, yet the examination of their modes of working can be of value to the American millman in causing him to ponder over the why and wherefore of many parts of his own practice whose advantage he is too ready to accept without previous questioning or consideration.

ABSTRACTS OF OFFICIAL REPORTS.

LEHIGH COAL AND NAVIGATION COMPANY.

The seventy-second annual report of the Board of Managers of this company bears date February 28th, 1893. The coal tonnage of the Lehigh & Susquehanna Railroad and Lehigh Canal for 1891 was 6,196,051, and for 1892, 5,569,622, a decrease of 626,429 tons. The gross receipts for coal in 1891 were $5,327,744, and in 1892, $5,022,223, a decrease of $305,521. The output of coal from the company's property was 1,293,662 tons, the largest yet reached. The average cost per ton of producing coal in 1892 was $1.476, about the average for the last three years, but in reality 7 cents higher than for 1891. At the date of the report it had on hand coal to the value of $132,371. The coal tonnage carried in 1891 and in 1892 is shown in the following statement, which gives the origin of the shipments:

	1891.	1892.
Wyoming region	3,309,093	3,085,188
Upper Lehigh region, Nescopeck Branch	475,829	472,952
Black Creek region, Drifton Branch	448,061	16,316
Beaver Meadow region, via N. Y. R. R.	632,312	668,179
Mauch Chunk region	1,281,603	1,290,813
L. V. R. R., Penn Haven, etc.	47,924	26,848
Schuylkill region	1,229	9,326
Total	6,196,051	5,569,622

The coal was distributed as shown in the following statement:

	1891.	1892.
East of Mauch Chunk by rail	5,205,322	4,707,301
East of Mauch Chunk by canal	364,250	337,509
On line above Mauch Chunk	219 785	211,088
To connecting lines above Mauch Chunk	406,694	313 724
Total	6,196,051	5,569,622

It will be seen that the reduction in tonnage carried was chiefly in coal from the Wyoming region destined for tidewater points.

Brick Paving.—Brick paving has been laid in the city of South Bend, Ind., on a foundation of well-rolled gravel, and is stated by the city engineer, Mr. W. M. Whitten, in a letter to "Paving and Municipal Engineering," to be in as good or better surface after a year's traffic as the brick paving in other cities laid on a concrete foundation. He also states that a street in South Bend paved with one course of brick is in better surface than one paved with two courses at a cost 30% greater. Mr. Whitten lays all brick pavements with the courses at an angle of 45° with the line of the street, and believes that the pavement wears more evenly and keeps in better surface when so laid.

The New Harlem Bridge.—Plans have been completed for the important new bridge over the Harlem River at Third avenue in New York. In accordance with the requirements of the law the new bridge is to have a clear height of 26 ft. above high tide; it will, therefore, be about 16 ft. higher than the present structure, making expensive approaches necessary. The bridge proper will consist of a draw and two fixed spans; the total length of bridge and approaches will be 2,624 ft. The width will be 86 ft., and there will be two tracks for street cars, two roadways for teams and two sidewalks. The draw-span will be 300 ft. long, giving two clear openings of 104 ft. each. The Third avenue bridge carries probably a greater traffic than any other highway bridge in this country.

Thomas-Gilchrist Steel in 1892.—According to the annual official statistics of the Thomas-Gilchrist Steel Association the basic steel and ingot iron made from phosphoric pig in 1892 amounted to 3,202,640 tons, as against 2,859,500 tons in 1891, a gain of 12%. Two-thirds of the total production is credited to continental steelmasters. Germany and Luxembourg have produced between them 2,013,484 tons; France, 287,528 tons; and Austria and Hungary, 288,122 tons. Of the remainder Belgium, Russia, and the United States made together, 206,667 tons, and England, 406,839 tons. Of the total amount the basic open-hearth method of working produced somewhat over half a million tons, the remainder being made by the Bessemer basic system. In two-thirds of the whole make the carbon was under ·17%.

All countries except England showed an increase varying from 5 to 20% last year over the production of 1891.

THE WALKER DETACHING HOOK.

The illustrations given show a form of detaching hook invented by Mr. William Walker, of Saltburn, Eng., and which has come into very general use, according to "Engineering" in England and the English colonies, and in France and Russia. It was first devised and introduced nearly 20 years ago, but has been modified several times and recently received important improvements. The illustrations show it in its latest form. The one shown was supplied to the Harris Navigation Company in South Wales. At this colliery an output of 1,000 tons per day has been reached, and the load brought up in each cage has been increased, inclusive of tubs, cage, etc., to 15 tons. When this was done the old form of hook made of iron plates was abandoned, and preference given to Mr. Walker's system. Fig. 1 shows the hook just entering the supporting ring, and Fig. 2 shows the position after detachment. The lifting rope is attached to the shackle A, and the load to the bottom link B. The supporting ring C, shown in section, is a flat steel plate fixed on balks of timber or iron girders, at the pit top. The hook consists of a pair of jaws D, D, working on a center-pin in such a manner that the weight of the load has a tendency to open the upper limbs, which clip the strong center-pin of the shackle A. The upper limbs are formed with external jaw-hooks F, F, which are kept together and made to retain their hold on the shackle-pin by means of the steel clamp H, which is held in position by the upper pair of the four pins seen in the engraving. In case of overwinding, the jaw-hooks pass freely into the ring C, but the projections K, K of the clamp, coming in contact with the underside of the ring, hold the clamp stationary while the jaws are being pulled through, the result being that the pins are sheared off, the lower pair being cut just as the jaw-hooks reach the top of the ring, when, by the combined influence of the weight of the load and the action of the clamp on the lower limbs, the jaws are forced open and hook on the top of the supporting ring C, as shown in Fig. 2, the rope passing harmlessly over the pulley, while the clamp

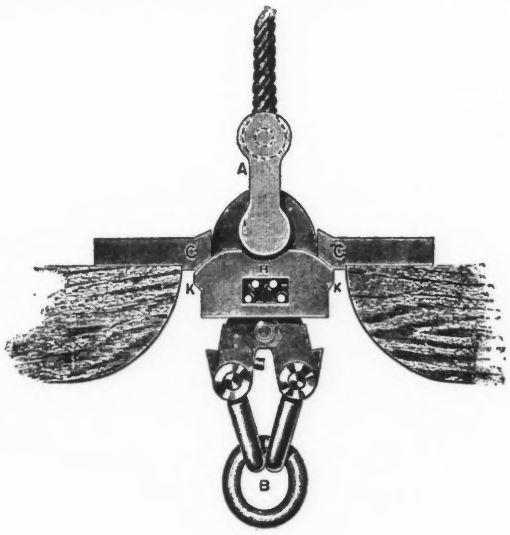


FIG. 1.

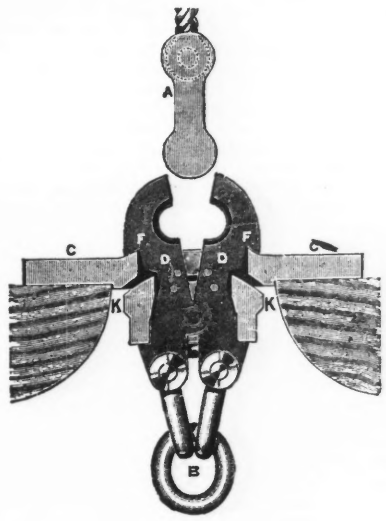


FIG. 2.

THE WALKER DETACHING HOOK.

so locks the lower limbs that the upper limbs cannot possibly shake themselves free, however great the shock. A large number of hooks for loads of 8, 10 and 15 tons have been made for different collieries and mines on the above principle.

The "Caisson Disease."—The Standard Gas Company is building a tunnel under the East River from Long Island City to New York to carry its gas pipes. The workings in the tunnel are carried on under an air pressure of 40 lbs., and are said to have developed several cases of the peculiar disease or trouble which has before been remarked as affecting men who worked under similar circumstances, and to which engineers have given the name of the "Caisson disease." It is particularly dangerous to those who have affections or defects of the heart. Of the cases at the Standard company's tunnel only one reported has been serious. The foreman of one of the working shifts died very suddenly a few minutes after coming out of the air-lock and into the upper air. He was a man who had been accustomed to similar work for several years, and apparently in excellent health.

Light-Weight Gold Coin.—A Washington dispatch says that the Treasury Department continues to receive offers of gold from the West in exchange for small notes, for which there is a present and increasing demand. Several of the offers of gold, after they had been made, had to be temporarily declined, as it was found that the gold was of light weight, and until those who offered it made up the deficiency in weight the Government could not accept it. The Government requires absolute accuracy before it will receipt for light-weight coin. Only a short time ago a consignment of gold was received at the Treasury Department from San Francisco. The gold came in heavy canvas bags, and in an aggregate of $250,000 of gold it was found that it was 9 cents light in weight. The cashier of the Treasury had to make good the deficiency of 9 cents, but the bags themselves were sent to the assay office at Philadelphia, and were burned, the gold being recovered from the bags by a smelting process and returned to the cashier, who in the end lost nothing.

IRON AND STEEL WATER TANKS.*

By William C. Coffin, Jr.

Iron and steel tanks are in use in public and private water-works as storage reservoirs, settling tanks and standpipes. Generally they are designed to act, to a certain extent, in each of these capacities.

The question of dimensions, both of cubic contents and of proportion of height to diameter, is decided by the special local requirements.

The best economic proportions for storage tanks is to make the height from two-thirds of the diameter to once the diameter. The height of settling tanks should be about one-fourth of the diameter.

Storage tanks usually need only a ring wall with gravel or concrete packing under the bottom, and when the height is small the ring wall may be abandoned and the tank set on a levelled grade, with all vegetable soil removed, well trenched and drained outside to avoid storms from washing the ground from the outer bottom. If the surface is of a clay nature, the trench should be lined with cement as a further precaution.

The inlet and outlet pipes should be underground and below the frost line, and enter the tank in the bottom, using an elbow with a foot or bearing and a vertical length of pipe passing through a gland which is riveted to the bottom. This connection should be in, at least, 3 ft. from the shell. Connections made on the shell, or which are riveted direct to the bottom, are subject to heavy temperature strains which endanger the safety of the joint.

Anchor bolts, when needed, should always be proportioned to insure the stability of the tank under the heaviest wind pressures without allowing for any weight of water. The connection to the shell should be designed to bring the rivets into direct shear, and proper re-enforcement of the shell should not be neglected.

Where the proportion of height to diameter is great, brackets may be economically employed to increase the width of the base. They are often used, however, when not necessary, as they add somewhat to the appearance, but unnecessary connections are not only extravagant, but add greatly to the danger of leakage.

Tanks and standpipes should be made of good commercial iron or steel and should be critically inspected for defects of any nature, but high-grade boiler or flange qualities are quite unnecessary excepting in cases of extremely large tanks where it is desired to use every means of decreasing the thickness of the plates. Steel is now used almost entirely owing to its low cost and superior strength. A fair specification is: "From 57,000 to 65,000 lbs. tensile strength, with an elongation of 20% in 8 in."

While the best practice is to drill all rivet holes, or to punch them 1-16 in. smaller than the rivet, and then ream them out ⅛ in. larger, it is not customary, nor necessary, except in very heavy work.

In thickness, nothing less than 3-16-in. plate should ever be used, while ¼-in. thickness is the best minimum to establish. In large tanks the bottom plates should be of ¼ in. or 5-16 in. In standpipes ⅜ in. or ½ in. should be used. The plates in large tank bottoms can be lapped at the joints, but inside butt strips make the best work. The rivets should not be countersunk on the bottom, as full heads make tighter work. The main point in the foundation is to have uniform bearing on the bottom.

The proper factor of safety is a point much discussed, the opinions varying from 2 to 10, but in practice from 3 to 4, with an allowance for corrosion, has been found to work well. The usual method is to double rivet vertical seams and single rivet horizontal ones; diameter of rivets to be double the thickness of plate and pitch to be three diameters for single and four for double rivets.

Plates should be about 5 ft. wide and from 9 to 13 ft. long. There are practical objections to excessively large plates that over-balance the saving of joints. They are more subject to warping in manufacture and get out of shape in transporting. Alternate inside and outside rings are to be preferred to telescoping. The outside edges of all sheets should be bevel sheared or planed to about 60° for caulking with a blunt tool. Inside caulking should be called for on thicknesses

* Abstracted from paper read before the Engineer's Society of Western Pennsylvania at Pittsburg.

over 5/8 in., but with lighter plates it is apt to undo the outside work and is unnecessary.

The bottom should be connected to the shell by an internal angle iron, as this allows the shell and bottom to be caulked against the angle. When it is desired to give the shell a greater bearing on the bottom (in large standpipes) both internal and external angles can be used, the outer one for strength, and the inner one of light thickness for caulking.

A large manhead should be provided in the lower ring for use in constructing, cleaning and repairing. The best form is a circular wrought iron flanged neck 20-in. diameter with a bolted cover plate of the same material. The elastic flange can be well caulked. Cast iron manheads are heavy and treacherous.

One 3 × 5-in. angle around the top will provide against the collapsing of an empty tank, from wind pressure, to a diameter of 20 ft., or two for 30 ft.; larger tanks should have cross-tracing. Too many braces are apt to cause leakage.

To protect tanks after erection three coats of paint should be used; tests should be made beforehand to see that the mixture is of the proper temper, so as not to scale off. This can be done by dipping a coated piece of iron in cold water and also in hot and testing it with a hammer.

Asphaltum, oxide of iron, and lead paints give almost equal satisfaction; the lead mixtures are probably the most protective and durable.

SOME MISCONCEPTIONS CONCERNING ASBESTOS.

Written for the Engineering and Mining Journal by J. T. Donald, M. A., Montreal.

During the past decade the uses of asbestos have become widely extended, and consequently brought to the knowledge of the great majority of those who live within range of our industrial centers. As a result of the wide applications of this substance and of the interest excited in the minds of many by a "stone" which may be teased out into a fluffy mass resembling silk or cotton, there has arisen a somewhat extensive literature of asbestos. This is scattered through geological, chemical, technical, and even religious publications, while there have appeared one or two not unpretentious volumes devoted entirely to this mineral. In these there are frequent statements which clearly indicate that the writers entertained serious misconceptions, and to call attention to some of these is the object of this paper.

1. There is a misconception as to the mineralogical character of asbestos, and this has arisen from the use of the name in a somewhat generic sense. Dana in his "Mineralogy" says that asbestos is a finely fibrous form of hornblende, but much that is so-called is fibrous serpentine. This statement seems to divide many of our writers into two camps, the one calling the mineral a variety of hornblende, the other proclaiming its serpentinous character.

The Canadian province of Quebec produces, it is estimated, about 85% of the world's supply, the balance coming principally from Italy. The products of these two countries are known the world over as asbestos, and it is not unreasonable, therefore, to ask that they be allowed to appropriate the name, even though they be of other composition than the mineral to which mineralogists originally applied the term, and that other minerals, if such there be, used for similar purposes be otherwise designated.

The asbestos of commerce is a hydrated magnesian silicate of the same composition as ordinary serpentine rock; in other words, it is fibrous serpentine. It is curious to note, however, that the Canadian miners working continually among serpentine and nothing else have fallen upon the word hornblende, and apply it to very coarsely fibrous and polished serpentine, such as is often met with along lines of faulting.

2. The second misconception is in reality but a special case of the first; it is to the effect that Canadian and Italian asbestos are different minerals. In the early days of the asbestos industry Italy was the only source of supply, and immediately prior to the discovery of the Canadian deposits a powerful company had been formed and had succeeded in bringing under one control the numerous small mines of the Italian district. Under the circumstances it is not to be wondered at that the Canadian fiber found no favor in the eyes of the owners of the Italian mines. The Canadian mineral was declared to be far inferior to the Italian; the latter, it was maintained, is true asbestos, while the former is only fibrous serpentine. As a matter of fact the two minerals are practically of the same composition, as is shown by the following results of analysis of fair samples recently made by myself: Italian: Silica, 40·30; magnesia, 43·37; ferrous oxide, ·87; alumina, 2·27; water, 12·72; total, 100·53. Canadian: Silica, 40·57; magnesia, 41.50; ferrous oxide, 2·81; alumina, ·90; water, 13·55; total, 99·33.

Canadian asbestos has largely displaced the Italian, not because of difference in composition, but by reason of the greater ease with which the former can be wrought into the various forms required in the arts.

3. The third misconception is that asbestos is in nowise affected by heat. This is set forth in such statements as "temperatures of 2,000° to 3,000° are easily withstood," and "a mineral which has been successfully exposed to a heat of 4,500° to 5,000° Fahr." Now what are the facts of the case? It is true that asbestos is infusible except at very high temperatures, but it is equally true that only a very moderate degree of heat, heating to low redness in a platinum crucible for instance, is required to entirely destroy the flexibility of the fiber and render it so brittle that it may be crumbled between thumb and finger as readily as a piece of biscuit. In this connection one is reminded that the ancients are said to have possessed asbestos napkins which they cleansed by means of fire, and that Charlemagne in like manner cleansed his tablecloth to the delight of his warrior guests. It is not improbable that these statements are to a large extent mythical; certainly, if true, the articles in question were not made of asbestos, the hydrated magnesian silicate.

4. The fourth misconception is that asbestos is possessed of high non-conducting qualities. This is perhaps the gravest and most widely spread of the several misconceptions, and is held by many who should know better. As an example of the manner in which this last misconception is set forth I may cite the following from an address of a well known geologist "Among the most important properties of asbestos is that of non-conductivity or its power of resisting the action of heat." Here we have the misconception clearly stated; it is that because asbestos is infusible it must of necessity be a good non-conductor. The truth is that asbestos itself is a very poor non-conductor, as any one may prove by placing a vessel of water on a sheet of asbestos cardboard and applying heat from below, or more simply still by placing a piece of wood on a sheet of asbestos millboard on a hot stove. If, however, asbestos is teased out and worked into a fluffy mass we then obtain a non-conducting material, but it is the air inclosed by the fibers that is the real non-conductor, the asbestos serving simply to entangle the air. The use of asbestos in the manufacture of non-conducting coverings for boilers, etc., is due to its fibrous texture and its infusibility. The latter property gives it a decided advantage over hair and other fibrous materials which char under continued exposure to heat, while the exceeding flexibility of its fibers gives it a like decided advantage over mineral wool and other fibrous but brittle mineral substances.

The removal of the misconceptions to which attention has been called will in no respect tend to decrease the uses of asbestos, for the mineral has a sufficiency of good quality of its own to maintain and increase the demand; while, on the other hand, a true conception of its nature and properties will prevent its use under conditions where only disappointment can follow; a circumstance which in the end would tend to bring discredit upon a most valuable mineral.

DIAMONDS IN METEORIC STONES.

H. Moissan in the "Comptes Rendus" for 1893, pages 116 and 288, gives the result of his investigation as to the nature of the Canyon Diablo, Arizona, meteorite. He found in it transparent diamond, black diamond, brown coal, and graphite. In the same periodical, 1893, pages 116 and 288, he mentions the existence of graphite, black diamond and microscopic transparent diamonds in the "blue-clay" of the South African diamond mines, which, he says, contains more than 24 species of minerals. These results are of great interest, especially when taken in connection with the discovery, by W. Luzi and A. Sauer, of graphitoid in certain quartzite slates and phyllytes of the Taxon Erzgebirge. These gentlemen found, near Wiesenthal, an amorphous substance which contained 99·02% of carbon, and 0·54% of hydrogen, but no nitrogen. It resembles the mineral schungite, which was discovered in 1884 in phyllyte from the Olonetz government, Russia, and contains some nitrogen. The Canyon Diablo meteorite has also been examined by C. Friedel ("Comptes Rendus," 1893, pages 116 and 200), who found that the microscopic transparent diamonds became visible after removing the black diamonds, or carbonado, with methylene iodide. He found also that between the layers of the nickel-iron and accompanied by lamellae of schreibersite there were thickish leaves of a lustrous, silver-white substance which proved to be a subsulphide of iron, with 10·2% sulphur and 88·3% iron, corresponding, therefore, to the formula Fe_5S. Imbedded in this substance were little knots of yellow troilite, and the mixture of ordinary coal, graphite and diamond seemed to be concentrated near the troilite. The little knots of troilite were surrounded by a thin layer of the lustrous subsulphide of iron.

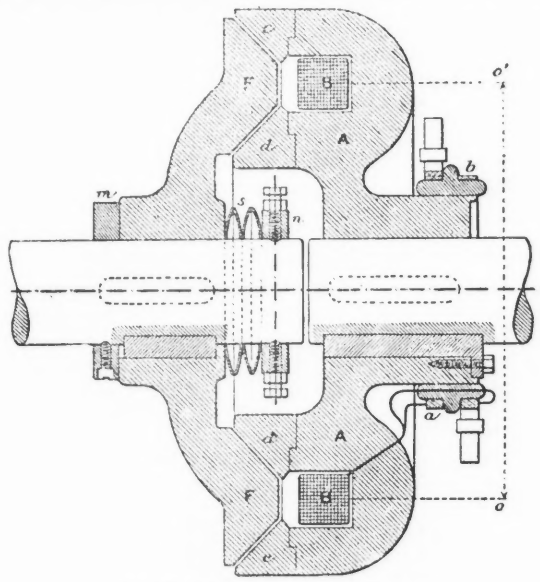
Railroads in Colombia.—The Bogota & Magdalena Railway Company on March 13th, filed articles of incorporation with the Secretary of State of Colorado, at Denver, for the purpose of purchasing and operating the Girardot Railway in the Department of Cundinamarca, Colombia, by concession from the government to John H. Pennington. The stockholders are principally capitalists of Pittsburg, Indianapolis, New York, Philadelphia, and Bogota. It is proposed to build three lines of railroad, about 300 miles in all, from Bogota to points on the Magdalena River. The principal offices will be in Pittsburg, Pa.

The Ernst August Adit Level.—In a recent issue of the "Berg und Huttenmannische Zeitung," Dr. O. Brathuhn describes the latest extension of the Ernst August adit level, the deepest adit level of the Upper Harz. The new branch extends from the Johann-Friedrich shaft at Bockswiese to the Gute des Herrn shaft at Lautenthal, and is 4,753 yds. long. The total length of the adit level is, therefore, increased to 29,576 yds. The branch was driven in three sections, of which the first from the Schwarzen mine in Lautenthal, to the Johann-Friedrich shaft, is interesting, as the survey affords an illustration of the accuracy with which the surface and underground surveys may be connected by means of magnetic instruments. On account of the dense forest the relative position of the two inclined shafts was not determined by special triangulation, but was deduced from the Ordnance survey. This is the first time that the triangulation points of the Ordnance survey have served as the sole basis of an important piece of underground work. The first determination of the floor level was made in 1876; as, however, in driving the Lautenthal section the floor became somewhat higher, and the adit somewhat shorter than originally planned, the leveling was repeated. The Lautenthal end was found to be 8 in. higher than it should have been, and this error was balanced off by a slight increase in the gradient in the Lautenthal section before holing. The transference of a point from the surface into the mine was done by means of the inclined shafts 1,100 ft. and 670 ft. deep respectively, and the orientation of the two sections, respectively 1,630 yds. and 1,991 yds., was effected by means of the magnetic needle. After holing it was found that the azimuth of the last line of the traverse in one section deduced from the last line in the other presented the small error of 1 min. 8 secs. The accuracy of this survey does not exceed that obtained in the older portions of the adit, but by the use of improved instruments, and with experience from former work, it was possible to make the survey in much less time and with greater certainty.

THE BOVET MAGNETIC COUPLING.

Attention has been called by "L'Industrie Electrique" to some remarkable experiments on the use of the adhesive force between two pieces of iron forming part of the same magnetic circuit for mechanical purposes. These experiments were made by M. de Bovet in connection with the engines used for chain towing on the Seine, and in the course of the investigations he was struck with the number of applications which might be made of magnetic adhesion on the condition that it was systematically studied, and all doubts as to the magnitude of the effects obtainable were removed from the minds of its many opponents. Among other applications, that of couplings may be noted. The problem is one well known to mechanical engineers and the multitude of methods which have been proposed is a proof that none of them completely fulfilled the conditions of the problem. When it is a question of transmitting small powers friction is generally used. For large amounts of power friction must be given up, and recourse had to claw or grip clutches; but these have the great defect of not being easily operated while working, and when this condition is imperative as in certain apparatus, such as variable speed rollers, the problem is not an easy one.

M. de Bovet's magnetic coupling, which is one of the results of these experiments, is shown in the accompanying illustration. It consists of a block A in cast or wrought iron, around the face of which a groove is made, in which the wire B is placed. It terminates in rings a b, on which brushes bear. The whole is keyed to the power shaft. The shaft to be clutched is provided with a block F, capable of sliding along and approaching c d until it is in contact. It follows, therefore, that when the wire B is traversed by a current, F is attracted against c d, and participates in the motion of A. The chief advantage of the system resides in the fact that, contrary to that which takes place with all kinds of friction clutches, adhesion is obtained without any external reaction. The magnetic forces in a closed circuit are all internal, and



THE BOVET MAGNETIC COUPLING.

there is no thrust on the journals nor reaction of elastic parts on supports. It will be observed, that the magnetic circuit is cut across in the shape of a wedge. This is another very important point, which gives the apparatus the valuable property of limiting the maximum transmitted effort, and permitting slipping when this amount is exceeded. Experiment shows that if the resisting effort becomes too great A slips, but does not release F. This property enables one to entirely avoid injury to apparatus connected to F, such as chains, gearing, etc., since it is only necessary to regulate the value of the current in order to insure that the required maximum effort is not exceeded. If the contact surfaces of A and F were flat, the same result would not be attained; there would no longer be merely slipping, but complete disconnection, which might often give rise to grave inconveniences. With very small dimensions this clutch can be used for very large powers. A 400 or 500 H. P. clutch running at an average speed is only from 36 to 40 in. in diameter.

Many other applications of the same principle may be suggested, railroad brakes and hoister brakes being prominent among them.

Analysis of Galena.—Mr. Rudolph Benedikt, in "Chemiker-Zeitung," gives the following method of determining lead in galena. The pulverized mineral is covered with water in a porcelain capsule, and then decomposed with a few c.c. of commercial hydriodic acid of 1·7 specific gravity. If the moistening with water is omitted there ensues a violent effervescence. The capsule is covered with a watch glass and heated on the water-bath, by which the lead sulphide is completely converted into lead iodide. When the change is complete the whole is evaporated to dryness. The residue when cold is covered with dilute nitric acid, the capsule is covered and heated on the water-bath. The nitric acid decomposes the lead iodide, with liberation of iodine. As soon as the oxidation is at an end the capsule is uncovered, the contents evaporated to dryness, the residue is moistened with dilute nitric acid, filtered, and washed out, when the entire lead is in solution as lead nitrate, and may be determined with sulphuric acid in the usual manner. Lead sulphate can be converted into lead nitrate in a similar manner.

DECISIONS OF THE BOARD OF GENERAL APPRAISERS.

BOG IRON ORE.

In the case of the Prince Manufacturing Company against the Collector of Customs at Ogdensburg, N. Y., concerning the duties on bog iron ore, it was decided that, as the material in question contained over 53% of iron, was used for purifying gas and never as a paint or color, it was iron ore and dutiable at 75 cents a ton.

CADMIUM YELLOW.

Protest of the Roessler & Hasslacher Chemical Company, of New York, concerning the duties on cadmium yellow. The merchandise was invoiced as cadmium yellow and assessed for duty as a pigment at 25%. It was claimed it was exempt from duty as cadmium. The board found that cadmium yellow was "something more" than metal cadmium, and the protest was overruled.

MAGNESIUM CHLORIDE.

Protest of Eastwood & Co., of Boston, against the Customs Collector of that port concerning the duties on chloride of magnesium. The material was assessed for duty as a chemical salt, and it was claimed that it was exempt from duty "as either magnesium, as muriate of potash, or as kieserite." The Board found that chloride of magnesium differed from all the foregoing, and was a chemical salt. The protest was overruled.

MINERAL WHITE.

Protest of John Bromley & Sons against the Collector of Customs of Philadelphia concerning the duties on mineral white. The material was assessed for duty at 20%, under Section 4, new tariff, and it was claimed that it was dutiable at $1 per ton, as plaster of paris, under Paragraph 97. According to analysis the article is composed of corn starch 7·10% and dehydrated calcium sulphate 92·90%. The matter, consequently, is not plaster of paris and the protest is overruled.

DUTIES ON GROUND ASPHALT.

Protest of the Roessler & Hasslacher Chemical Company against the decision of the Collector of Customs of New York as to the rate of duties on ground asphalt. The asphalt was assessed for duty at 20% ad valorem under Section 4, new tariff, and the importers claimed free entry as crude asphalt under Paragraph 496, new tariff. The Board found that said merchandise is bituminous limestone advanced in condition by grinding, and containing in its natural state about 8% of bitumen; also, that said limestone is naturally impregnated with bitumen, and is quarried in Italy. It is a non-metallic substance, and is not crude asphalt. The Board therefore sustains the Collector.

CHROME ORE.

Protest of the Baltimore Chrome Works, of Baltimore, Md., against the decision of the Collector of that port as to the duties to be paid on chrome ore. The appeal was sustained. At the time of making the entry the appellants added to the per se value of the ore, the cost of transporting the same from the mines of Syria to the shipping port, and also added a sum equal to the tax imposed by Turkey on ore mined in and exported from that country. No question was raised as to the action of the Collector in assessing duty on the amount of tax so added. The question at issue was whether duty should be assessed on these transportation charges, or whether the company should pay duty on the goods, based on their value at the mines. The Board held that the entries of the ore were made under duress and that said entries are not binding upon the appellants. The protests lodged against the assessment of duty on transportation charges from the mines to the exporting vessel are, so the Appraisers say, well founded and the same are sustained. The Collector's decision is reversed and he is authorized to reliquidate the entries in accordance with this decision.

A New Wolfram Alloy.—Prof. Dr. Poleck recently read a paper before the Silesian Society on a new alloy of wolfram and iron, which is reported in "Stahl und Eisen." The specimen given came from the Biermann Works, in Hanover, and was especially interesting from the fact that, while the mass contained 78·76% wolfram, 15.94% iron, and 5·03% carbon, giving the formula $Fe_3 W_3 C_3$, it contained, scattered through the mass, isolated crystals, having only a trace of carbon, and containing 13·07% iron, and 86·4% wolfram, the formula being $Fe W_2$, showing a compound much richer in Wolfram. These crystals were hexagonal, with a silvery luster, very heavy, and had the hardness of corundum. The specific weight of the general mass was 12·92 to 13·04.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining metallurgy and kindred subjects issued by the United States Patent Office:

TUESDAY, MARCH 7TH, 1893.

492,832. Process of Making Sublimated Lead Pigment. Carl V. Petraeus, Joplin Mo., Assignor to Oliver H. Picher, same place.
492,904. Dumping Car. Ernst A. Kaufman, Canton, O.
492,917, 492,918. Running Gear for Mining Cars, Lumber Trucks, Etc. John Gowland, Philipsburg, Pa.
492,962. Grinding Pan. James H. Kinkead, Virginia City, Nev.
493,023. Process of Obtaining Chlorates of the Alkalies or of the Alkaline Earth Metals by Electrolysis. William T. Gibbs and Stanislaus P. Franchot, Buckingham, Canada.
493,047. Apparatus for Casting Metals. William S. Simpson, London, England.
493,076. Furnace for the Treatment of Refractory Ores. Charles J. Fauvel, London, England.
493,129. Cam for Stamp Mills. George A. Thompson, Tombstone, Ariz.
493,137. Bracket for Miners' Lamps. Julius R. Watts, Springfield, Ill.
493,141. Apparatus for Manufacturing Artificial Stone. Friedrich Zernikow, Oderberg, Germany.
493,142. Sifter or Separator. Casper Zimmerman, Denver, Colo.
493,173. White Lead. Norman K. Morris and John W. Bailey, Denver, Colo.
493,175. Rock Drilling Machine. James McCulloch, Minas Rio Tinto, Spain.
493,193. Process of Roasting Sulphur Bearing Ores. Charles W. Stickney, Butte, Mont.
493,226. Dredge. Erastus S. Bennett, Denver, Colo., Assignor to the Bennett Amalgamator Manufacturing Company, same place.

PERSONALS.

Mr. Geo. W. Irvin, 2d, has been appointed mineral land commissioner of Montana.

Mr. G. E. Olcott, mining engineer, has returned to New York from a visit to California and Idaho.

Mr. W. A. Jowett, of Nelson, B. C., was recently in New York, on his way to England.

Mr. Robert H. Rogers, of Plattsburg, N. Y., has been appointed mine inspector of the State of New York.

Capt. John Thomas will take charge of the Swanzey mine, Michigan, belonging to the Escanaba River Land and Iron Company.

Mr. Walter Renton Ingalls, mining engineer, of New York, sails to-day on the "Gallia" for Europe, where he will remain about three months.

Mr. R. T. Bayliss and Mr. F. P. Crowther, of the Montana Mining Company, Limited, left England on the 8th inst. to examine the condition of the property at Marysville, Mont.

Mr. Frederick Roeser, for some time past with the Kootenai Smelting and Trading Syndicate, in British Columbia, is now in New York. He expects to return to the Pacific coast before long.

Mr. M. F. Hannon has resigned the position of superintendent of the Duluth & Iron Range ore docks, at Two Harbors, Minn. He has been elected president of the Moose Mining Company.

Capt. Henry Roberts has been appointed superintendent of the Great McKinley mine, on the Mesaba Range. He has had charge of the Hope and Moy mines, on the Menomiuee Range for some years.

Mr. Henry King has resigned his position as general manager of the Roanoke, Va., Iron Company. His successor is Mr. Reuben Patterson, of Pulaski, Va. Mr. King retains an interest in the company.

Mr. Edward Ball, of Florence, Wis., has been appointed superintendent of the Platt mine, on the Marquette Range, Michigan, replacing Mr. Chas. L. Lawton, who has accepted a similar position at the Bessemer mine, in North Carolina.

Prof. W. M. Stine, late of the Ohio University, has been appointed head of the department of electrical engineering in the Armour Institute in Chicago. Mr. Ernest W. Cooke has been appointed head of the department of mechanical engineering.

Mr. Walter B. M. Davidson, mining engineer, who has lately been investigating certain mines in British Columbia, has sailed for China. The Chinese use some 10,000 tons of lead annually, and Mr. Davis proposes to investigate the market there for the lead of British Columbia.

Mr. James T. Taylor, chief engineer of the Riverside Construction Company, and Mr. Ernest J. S. Purslow, formerly locating engineer to the Arrowhead Reservoir Company, have entered into partnership, with head offices at Riverside, Cal., and are now engaged upon some extensive irrigation work.

A fund has been initiated by the Council of the Mineralogical Society to commemorate the scientific services of their late foreign secretary and editor, Mr. Thomas Davies, F. G. S., who was for upward of 34 years associated with the mineral collection of the British Museum. It has been proposed that this fund should be devoted to the assistance of Mr. Davies' widow and family, who have been left in greatly reduced circumstances. Several distinguished gentlemen are on the committee. Contributions may be sent to Dr. Hugo Muller, at 13 Parke Square East, Regent's Park, N. W., London, England.

OBITUARY.

Mason Loomis, of New York, died at Deadwood, S. D., March 16th. He owned properties near Deadwood.

James W. Hyatt, United States Treasurer under Mr. Cleveland's first administration, died at Norwalk, Conn., on the 12th inst., aged 55 years.

George de B. Keim died at Philadelphia, Pa., on the 10th inst., aged 60 years. He was for many years a director of the Philadelphia & Reading Railroad Company.

George W. Anderson, died at Pittsburg, Pa., March 16th, aged 66. He was born in Waterville, Me. He was the first to introduce natural gas in a puddling furnace, that of Rogers & Burchfield, in Leechburg, in 1876.

Lloyd W. Williams, who died at Cape Charles, Va., March 12th, aged 78 years, was for many years a prominent lawyer of Baltimore. He was also largely interested in coal lands in Pennsylvania and West Virginia, and was a director in several coal companies.

Mr. George C. Stone, who died at Englewood, Ill., March 4th, aged 26 years, was a young man of much promise. He was for several years in the employ of the Illinois Steel Company, and a few months ago was appointed superintendent of the steel department of the Congdon Brake Shoe Company.

John Morton Byers died at Swissvale, Pa., on March 4th, aged 61 years. He was a civil engineer engaged in the construction of the Washington Aqueduct, resident engineer of the Philadelphia & Erie Railroad, chief engineer of the Mifflin & Center County Railroad, chief engineer of the Pittsburg, Virginia & Charleston Railroad, of which he was superintendent for years. At the time of his death he was engineer of construction on the Pennsylvania Railroad, Western Division.

SOCIETIES.

Engineers' Club of Cincinnati.—At the regular meeting, March 16th, Mr. E. F. Layman read a paper on "Sidewalk Improvements in and Near Cincinnati," which was generally discussed.

Engineers' Club of Cincinnati.—At the February meeting papers were presented by Maj. L. M. Hosea on the "Treatment of the Miami Canal"; by Oswald Dietz, on "Peculiarities of Numbers," and by Col. Latham Anderson, on the "Disposition of Overhead Wires in Cities."

American Society of Civil Engineers.—At the regular meeting in New York, March 1st., Mr. G. Bouscaren read a paper on the "Restoration of the Cable Ends of the Covington & Cincinnati Suspension Bridge," showing how the eables were renewed after 25 years' service. This was briefly discussed.

Central Railroad Club.—At the regular meeting, to be held in Buffalo, N. Y., March 22d, the subjects for discussion are, "Defect Cards for Partial Repairs to Cars," and "Improved Combustion in Locomotives." The latter subject will be discussed with reference to both improving the efficiency of the locomotive and the prevention of smoke.

Massachusetts Highway Association.—This association was formed at a meeting of street and railroad superintendents, held in Boston recently. The object is to promote the improvement of roads and the adoption of better methods in road work by conference and the preparation of papers and reports. The officers are: W. E. McClintock, president; Lucien Stone, W. L. Dickinson, vice-presidents; Samuel S. Merrill, treasurer; C. R. Cutter, Boston, secretary.

Engineers' Club of Philadelphia.—At the regular meeting of March 4th the tellers reported the following gentlemen elected to active membership: Messrs. S. T. Wellman, H. O. Duerr, George M. Sinclair, B. C. Batcheller, Francis L. Miller, F. B. Brown, Wm. Penn Evans, Chas. E. Wolle. Mr. J. T. Stiles and Dr. S. L. West were elected to associate membership. An invitation was received to visit the Wellman Iron and Steel Works. Professor Joseph T. Rothrock made an address on "Wood Structure in Relation to Mechanical Purposes," which was illustrated by photographs.

National Geographic Society.—This society held its annual social reunion at Washington, D. C., March 15th, President Cleveland received the officers and their invited guests. The presentations were made by Dr. David T. Day, of the United States Geological Survey. Among those present were Prof. S. P. Langley, secretary of the Smithsonian Institution; Gardiner G. Hubbard, president of the society; Dr. J. C. Mendendall, of the Coast Survey; Maj. J. W. Powell, director of the United States Geological Survey; Gen. A. W. Greeley; Prof. Simon Newcomb and Bishop Keane, of the Catholic University.

INDUSTRIAL NOTES

The Berlin Iron Bridge Company, East Berlin, Conn., has ready a new catalogue of over 300 pages, illustrating a large number of bridges, roofs and buildings.

The Thacher Car and Construction Company has opened an office at Chicago, in the Monadnock Building, which will be in charge of Mr. L. F. Braiue as superintendent.

The F. M. Davis Iron Works, Denver, Colo., has recently shipped a number of horse whims to various mines. Work in hand includes a high-speed, 10-stamp mill for Leadville and a number of concentrators.

The plants of the United States Rolling Stock Company, at Anniston and Decatur, Ala., were sold at receiver's sale March 9th, and were bought in for the United States Car Company, the reorganized concern, for $150,000, subject to the general mortgage of $1,300,000.

A company has been formed with $500,000 capital to begin the manufacture at South Bethlehem, Pa., of steel pipes. The pipe will be made by a new process from steel billets. The factory will be near the tracks of the Lehigh Valley Railroad, east of the Bethlehem Iron Works, and will employ about 500 skilled workmen.

The Schenectady Locomotive Works, Schenectady, N. Y., have just completed nine locomotives for the ore trade on the Duluth & Iron Range railroad. The engines are of the 12-wheel pattern, with 4-wheel truck, and 8 drivers 54-in. in diameter. The cylinders are 22×29 ins., and the boilers are built for 180 lbs. working pressure.

The Hamilton Bridge Company, Hamilton Ont., has the contract for a steel arch bridge of 336 ft. span and 100 ft. rise, to be erected over a gorge in the Rocky Mountains, on the line of the Canadian Pacific Railway. The total length of the bridge will be 465 ft., and its height above the bottom of the gorge will be between 275 ft. and 300 ft.

It is reported that a syndicate of Boston men have obtained an option on the St. John (N. B) Rolling Mills, and an agent of the syndicate is now in Montreal endeavoring to obtain the four manufacturing firms of Peck, Benny & Co., Pillow & Hersey, Montreal Rolling Mills and Abbott & Sons. Options have been obtained on the New Glasgow, N. S., steel plant.

Robert Catterson and others of this city have purchased the Texas granite quarries in Burnet County, Tex., and incorporated the Texas Capitol Granite Quarry Company, with a capital stock of $1,000,000. The stone from these quarries is pink, and of a good quality. This granite was used in the construction of the State capitol at Austin. The sale was conducted by C. L. Dignowitz, of San Antonio, and the price is stated to be over $100,000.

Further suits for the alleged infringement of Thomas A. Edison's patent for the invention of the incandescent lamp were instituted by the Edison Electric Light Company against the Boston Incandescent Lamp Company and others and the Germania Electric Company on March 13th. The suits were begun in the United States Circuit Court of Boston, and injunctions are asked. Both defendants are Boston business concerns.

The Berlin Iron Bridge Company, East Berlin, Conn., has just completed an iron building, 38×112 ft., as a power station for the Roaring Fork Electric Light and Power Company, at Aspen, Colo. The same company has the contract for several new iron buildings at the shipyards of the William Cramp & Sons' Co., in Philadelphia, including a shipshed, 60×100 ft.; a blackboard, 75×200 ft., and a bending shed, 86×250 ft.

The Carnegie Steel Company, of Pennsylvania, has ordered a new press for its armor plate works at Homestead—an enormous piece of machinery that will cost over $1,000,000—from Whitworth & Co., of Manchester, England. It will be the largest piece of machinery of the kind in this country, and perhaps in the world. The press will have a capacity of 16,000 tons. The machine will arrive by the first of next year. It is said that by the aid of this machinery the company will be able to make the greatest forgings in the world, and a plate of 200 tons can be worked in one piece.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting machinery or supplies of any kind will notify the Engineering and Mining Journal of what he needs, his "Want" will be published in this column and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their address at this office.

No charge will be made for these services.

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, thus enabling the purchaser to select the most suitable articles before ordering.

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 or selling goods of any kind.

Goods Wanted at Home.

2,987. A well boring machine that will bore 1,000 to 1,500 ft. through sand and sand rock. Texas.

2,988. Prices on material for two miles of road, horse line. West Virginia.

2,989. A roller corn mill. Kentucky.

2,990. A good second-hand air compressor. Ohio.

2,991. Hardware, iron, guns, etc. Kentucky.

2,992. A good second-hand 4-saw gang edger. West Virginia.

2,993. Assayer's outfit, including scales, furnace, supplies, etc. New York.

2,994. Three iron door shutters, three iron window shutters and tin roofing for a house, 30×80. Louisiana.

2,995. Heating apparatus and furniture for a church. Alabama.

2,996. A bolt heading machine. Arkansas.

2,997. A screw cider press, capacity 3,000 gallons per day, a pump for taking hot water from 10 to 100 gallons jacket kettles and pumping same to boiler; a cider pump, capacity 3,000 to 4,000 gallons per day; 3 100-gallon copper jacket kettles and a boiler or cooker, made from steel 12 ft. long, 42 in. diameter, to stand 60 lbs. pressure. Virginia.

2,999. Creamery machinery, including a cream separator, a 60-gallon weighing can, a pair of

creamery scales, an engine and boiler, shafting, pulleys, etc. Virginia.

3,000. Prices on a good second-hand medium jobber proof press and paper cutters. West Virginia.

3,001. A complete outfit of veneer machinery for making baskets and boxes. North Carolina.

3,002. Two power pumps; one to pump 1,500 gallons per hour for boiler feed, and the other for tank feed to pump 15,000 gallons per hour. Virginia.

3,003. An awning. Kentucky.

3,004. Sorghum machinery to make up 15 or 20 barrels per day. Mississippi.

3,005. Prices on a complete outfit of machinery for canning fruits and vegetables, pickles, catsups, sauces, etc. Virginia.

3,006. Planing mill machinery. Virginia.

Goods Wanted Abroad.

2,998. A separator for freeing steam or hot water from oil. Mexico.

GENERAL MINING NEWS.

ALABAMA.

Jefferson County.

Mary Pratt Furnace.—This furnace, at Birmingham, was sold at auction March 10th for $100,000, the purchaser, Mr. W. T. Underwood, assuming a bonded debt of $57,000. The ownership of the furnace has been in litigation for three years, and it has been idle all that time.

ARIZONA.

Cochise County.

Tombstone Mining and Milling Company.—According to the Tombstone "Prospector" the Way-Up, West Side and Sulphuret are producing some rich ore. The winze is down nearly 200 ft. below water level in the Lucky Cuss, and prospecting will soon begin from that level.

Maricopa County.

(From our Special Correspondent.)

Gold Star.—The Bald Mountain, Gold Star, Sunrise, Amadole, Potosi, El Dorado and Ontario mines, with the Gold Star mill site and spring, have been bonded by J. McGinnis, J. W. McGinnis and J. R. Carty, of Yavapai County, to W. H. Guernheim, of St. Louis, a director in the Yuma Copper Company. The properties are all located about eight miles south from Castle Creek hot springs, and have been bonded for $12,000, of which $1,500 has been paid cash down. On June 10th, of the present year, the bond will expire, the property meantime being worked, in accordance with a stipulation in the bond, by Mr. Guernheim.

CALIFORNIA.

(From our Special Correspondent.)

The mining assessments falling delinquent during March in this state aggregate $50,500.

Mono County.

(From our Special Correspondent.)

The Bulwer Consolidated Mining Co., Bodie.—A quantity of pay ore is on hand, and when the experiments at the new Kinkead mill are finished it it hoped a small dividend will be declared. Repairs are being made in the new shaft, work being suspended meantime, but a week hence work will be resumed.

Placer County.

(From our Special Correspondent.)

Mayflower Gravel Mining Company, Forrest Hill.—A dividend of 10 cts. per share has been declared, payable on the 15th inst.

San Bernardino County.

Silver King Mining Company, Limited.—According to the manager's report for February, the mill worked 21 days, crushed 1,700 tons of ore and produced 28,000 oz. of silver. Working expenses amounted to $13,500.

COLORADO.

Colorado Fuel and Iron Company.—This company has filed at Denver, with the county clerk, a general mortgage to the Central Trust Company, of New York, dated February 1st, 1893, for $6,000,000 in bonds of $1,000 each, due in 1943, and drawing 5% interest. This mortgage is simply to take up and cancel other outstanding liabilities, and to place new bonds. It embraces all the company's stock, equipment, lands and property in sundry counties in Colorado.

El Paso County.

Victor Gold Mining Company.—This company has been incorporated under the laws of Colorado, with a capital of 200,000 shares of $5 each, full paid and non-assessable, to acquire and work the Victor mine, located on the east side of Bull Mountain, 3½ miles southeast of the town of Cripple Creek. The vein is from 3 to 6 ft. wide in porphyry. The pay streak of quartz and jasper is from 6 in. to 20 in. in width, and is said to be continuous throughout the vein, so far as developed. Two shafts have been sunk upon the property, No. 1 to the depth of 175 ft. and No. 2 to the depth of 80 ft. Three levels have been driven, the second of which, at the depth of 80 ft., is in ore for 550 ft. Up to February 1st, 1893. the mine has produced 632 tons, 1,641 lbs. of shipping ore of a total net value, with smelting charges deducted, of $57,320.43, and about 2,000 tons of milling ore, estimated to average from $14 to $24 per ton, have been allowed to accumulate upon the dump. Mr. Frank G. White, M. E., formerly superintendent of the Iron Silver Mining Company's property at Leadville, stated: "I regard the Victor vein as one of the most regular, persistent and perfect veins at Cripple Creek, and one which you can feel assured will be a steady and large producer for many years, and one that will increase in value upon further development." Mr. White's report has been indorsed by Mr. A. F. Wuensch, of Denver, Colo. Stock in this company is now being offered privately at $3.00 per share, and it is said, will be listed soon upon the Consolidated Stock Exchange.

Gilpin County.

A despatch from Black Hawk states that the output of ore from the mines of Gilpin County during the month of February shows a slight decrease as compared with the corresponding period of last year. The shipments from Black Hawk consisted of 152 carloads of ore and tailings, aggregating 4,260,000 lbs. This statement, together with the fact that from 450 to 480 stamps were constantly dropping on mill dirt from the various mines of the county, is encouraging.

Lake County.

Dunkin Iron Mine.—The lessees are taking out about 50 tons daily of iron ore.

Ouray County.

American Bell Mining Company, Limited.—A late report states that an important discovery of Engarite copper ore has been made in the south drift, 2d level of the National Belle mine. Assays show 29 to 33 oz. silver and 37 to 42% copper. The size of the ore body has not yet been determined. There are about 800 tons from the north ore body now ready for shipment.

Pitkin County.

Della S. Mining Company.—The Aspen "Times" reports that an important strike was made March 4th, in the mine on leases Nos. 33 and 47. Lease 33 is operated by Steve Finley and George Collins, and Lease 47 by Messrs. Van Voorhis and Niel. All the lessees are said to be doing well.

FLORIDA.

Florida Pebble and Soft Phosphate Company.—This company has ordered a cylinder dryer of large capacity. Large shipments are now being made to Georgia and Virginia.

High Springs Phosphate Company.—At the recent annual meeting in Jacksonville, the following officers were elected: President, A. W. Barrs; vice-president, H. W. Clark; secretary and treasurer, W. A. Bours. The president stated that he had closed contracts for the year's delivery to the full capacity of the present plant. It was decided to put in another plant at an early day. The board declared a quarterly dividend of 5% on money invested, payable March 15. This is the second dividend declared.

GEORGIA.

Floyd County.

(From our Special Correspondent.)

Bauxite.—The bauxite deposits of this county are just now receiving marked attention from representatives of some Eastern syndicates. This district extends from the south line of the county northwards a distance of about four miles, and to a point within eight miles southwest of the town of Rome, with a breadth of about two miles. It is within the limits of this area that all the known deposits of bauxite ore occur, in this immediate vicinity; but there are two other districts in this county—one known as Ridge Valley, about 16 miles to the northeast, and the second Cave Spring, about 8 miles to southwest. This district has been prospected extensively during the past two years, and although active mining operations, followed by regular shipments, have only been conducted at one point, yet extensive prospecting has been done at 13 places. It is generally conceded that the deposits of banxite are pockets, but I noticed on what is known as the Minter property, situated near the center of the district, the occurrence of apparently two distinct deposits, situated a quarter of a mile from each other, which may prove to be one continuous deposit when thoroughly prospected. Should this theory prove correct, then the fact that an imaginary line drawn in a southerly direction from Bobo's Bank, at present the extreme northern deposit of the district, so far as is known, to the extreme southern deposit, would intersect six known deposits in a distance of about four miles, would certainly stimulate owners to extensive prospecting work. At present, the discoveries in this district number in all 13. The most extensive work has been done at the Bobo Bank, from which about 2,500 tons of ore has been mined and shipped, but at present this is idle because of the litigation between Mr. Alex. Bobo, the owner, and the Southern Bauxite Company, the lessee. From several others shipments of sample carload lots have been made, and negotiations are pending for the purchase of some by Eastern capitalists. On the Rees property, where the ore body has been stripped about 50 ft. square, a cut run in, shows a face about 10 ft. thick on the east side hill, and test holes sunk about 25 ft. further up the hill than the stripping, show ore also, but the extent of the ore body is undetermined at present. A superior quality of red ochre is found in this district, and at one point a well 45 ft. deep shows this mineral paint on its sides as well as in the bottom. Several other deposits have been encountered in sinking wells, but no attempt to establish a market for it has been made. A short distance to the northwest of this bauxite district a good quality of both black and variagated marble was discovered and prospected with a diamond drill. These were encountered abont 20 ft. below the surface, but beyond the prospecting no extensive work was attempted.

Rome furnace has been in blast almost continuously since it was built in 1891. The bauxite ore used by the Southern Steel & Aluminum Alloy Company, of Rome, is mined at Ridge Valley, in this county. At present this district is the extreme northeasterly of the southern bauxite districts, and has been producing since 1889, when the first shipment of domestic banxite was made to the Eastern market. There are rumors afloat that the Pittsburg Reduction Works have purchased extensive bauxite banks in Georgia recently, near Pine Ridge Valley, and are making arrangements to mine and ship on a large scale. Prospecting for bauxite is being carried on by Mr. Alex. Bobo near Somerville, abont 20 miles north of Rome.

Lumpkin County.

Dahlonega Company.—This company's property was sold at public sale March 7th to satisfy several judgments. The sale included the Singleton, Lockhart, Ivy and Best mines, and the amount realized was $11,971.

Hand.—The new tunnel is in 100 ft., and has reached a small vein of good ore. The tunnel is to be continued at least 400 ft. further.

London Farm.—The placer mining on the Chestatee River has been giving good results.

Potosi.—A new pocket of ore has been struck and is reported rich.

Polk County.

Oredell.—The Oredell and Reed ore banks are furnishing brown ore to the charcoal furnace at Rome, which is running steadily on car-wheel iron.

IDAHO.

Alturas County.

Star Mining Company.—Mr. W. H. Smith, the superintendent, has resigned. The two-compartment shaft is now down 250 ft., is connected with the tunnel at a depth of 167 ft. by a cross cut 84 ft. long.

Shoshone County.

Coeur d'Alenes.

Bunker Hill & Sullivan Mining Company.—In our last week's issue we gave some of the causes assigned by Mr. Bradley, the manager, for the closing down of the property. Since then he has given out the following: "Our mining expenses—for mining, tramming and concentrating—have been $4.55 per ton on the crude ore. This is in the neighborhood of $30 per ton on the concentrates. The railroad and smelting charges are $25.50 per ton. On concentrates assaying 58% lead and 29 oz. silver per ton there is very little money left for the owners of the mine. No mention has yet been made of taxes, insurance, administration and legal expenses, the amount of $30 per ton applying entirely to the local expenses previously mentioned."

In an opinion delivered March 6th, by Justice Blatchford, for Chief Justice Fuller, in the cause of George A. Pettibone and other striking Coeur d'Alene miners in Idaho, against the United States Court, the court decided in favor of the miners. It directed that the indictments against them be quashed. These cases grow out of riots at the Wardner mines. The court, at that time, granted injunctions restraining the strikers from interfering with the men, and it was alleged that Pettibone and others conspired to violate the laws of the United States. The court holds that the indictment under which they were convicted of this charge is defective in that it was not shown that the men had knowledge of the order of the court. Justices Brewer and Brown dissented.

INDIAN TERRITORY.

Choctaw Coal Company.—An explosion occurred at this company's mine at Anderson on March 13th, and nine men were reported to have been killed.

MARYLAND.

Montgomery County.

At Norbeck a number of men are prospecting for gold, in consequence of some recent finds of gold bearing quartz. Such quartz has been found in various parts of the county, but never in paying quantities.

MICHIGAN.

Copper.

Calumet & Hecla Mining Company.—The conglomerate in No. 12 shaft, South Hecla, is 6 ft. wide and fairly rich.

Centennial Mining Company.—The cross-cut on the 31st level, from the No. 3 conglomerate shaft toward the Osceola amygdaloid, was drifted 103 ft. during February. This leaves about 450 ft. to be gone through before that lode is reached. The drift at the 13th level, north of No. 1 shaft, on the amygdaloid workings, is promising, and the last 75 ft. gone through has shown up some very good stoping ground, says the Calumet "News."

A cross-cut of 22 ft. run across the lode at this point was in good ground.

Centennial Mining Company.—The annual meeting of this company will be held in New York, April 12th. Transfer books close April 2d to 12th, both days inclusive. President Hinsdale issues a circular to stockholders in which he says the company has sold about $60,000 of the $300,000 bonds authorized, which, with proceeds of sales of copper, has paid off the floating indebtedness of $40,000 and placed company in ready funds.

Central Mining Company.—The conglomerate belt that was encountered in the bottom of the mine some time ago, from which a considerable amount of rich copper rock as been taken, is reported to be still looking well, says the Ontanagon "Miner."

Iron—Gogebic Range.

Ashland Iron Company.—The rise of water at the Ashland mine is becoming less and less from day to day, and is now gaining only about 12 in. in 24 hours. The Cornish pump, and the skips are kept going night and day. The company is having the Worthington pump, formerly used in the pumping station of the water-works company at Hurley, moved to its property; it will raise about 1,000 gallons a minute. Large boilers are being made to replace the old skips; they are 9 ft. deep and 3¼ ft. square, and when all of these are in use 2,000 gallons per minute can be raised. The opening between the Norrie and Ashland, on the seventh level, is being dammed up so as to prevent flooding the former, if the water should rise to that height.

Marquette.

Republic.—The machinery of this mine is to be transferred from its old grounds on the Marquette Range to the new Mesaba. The difficulty is, it is stated, that while the ore has been of fair quality, it had to be mined under pumps and at a depth of some hundred feet, and it could not hope to compete with the new Mesaba, where the ore is superior to that of the old Republic, and more easily mined, besides. As a result, the stockholders, who comprise Cleveland, Chicago and Detroit capitalits, have decided to abandon the old mine, where it costs $2 to produce a ton of ore, and move their plant to Mesaba, where better ore can be mined for 50 or 75 cts. a ton. A site has been purchased, and removal will soon be made. By it the town of Republic, Mich., with a population of about 12,000, will be left with nothing to support it.

Iron—Menominee Range.

Blue Iron Company.—Drifting in ore continues east from the shaft. The cross-cut is in 27 ft.

Chapin Iron Company.—The daily output at the mine is from 2,000 to 2,500 tons, and the working force is about 1,100 men. C shaft is being sunk, and is about 65 ft. below the 9th level. Shaft D is finised about 60 ft. below the 8th level, is connected with the 9th by a raise, and will be stripped down and timbered as soon as possible. The new timber shaft has just been completed to the 8th level, and is handling all the timber of the mine to that depth.

Chicago, Milwaukee & St. Paul Railway Company.—This company has undertaken a number of explorations in the iron lands of the Menominee Range. It has a diamond drill at work one mile north of Amasa, in Sections 33, 45, 33, and 20 men employed. There is also some work being done in Sections 23, 44, 33 on the south continuation of the Hemlock formation.

Hamilton-Ludington Iron Company.—The water at Hamilton shaft No. 2 is being kept below the 1,325-ft. level, and drifting toward No. 1 is under way. The drift, as commenced, is 21½ ft. wide. It will be gradually narrowed up to about half that width, and will be driven as far as thought practicable before the diamond drill is set to work, says the Norway "Current." There now six men and two power drills at work, but this force will be increased.

Hemlock River Iron Company.—This company has discharged nearly all of its men.

Michigan Mine.—This mine, at Amasa, is still idle, says the "Diamond Drill." A good body of ore has been laid bare, and exploration shows it to be large.

Pewabic Iron Company.—At the Badger mine a cross-cut has been commenced from the bottom of the shaft, which is 170 ft. deep. At the Pewabic the new shaft is down 80 ft. The present output is about 16,000 tons per month.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, March 13.

The mines of the lead and zinc belt closed a fairly active week on Saturday evening. The output of ore was large, and the sales fully up to the average. The zinc ore market was strong, and the top price paid for large lots of good clean ore was $23 per ton; the average throughout the district was $22 per ton. Lead ore declined a trifle and closed at $21.25 per thousand. Following are the sales of ore from the different camps for the past two weeks: March 6th—Joplin mines, 1,047,900 lbs. zinc ore and 148,570 lbs. lead, value $14,715; Webb City mines, 974,240 lbs. zinc ore and 40,940 lbs. lead, value $11,575; Carterville mines, 1,581,470 lbs. zinc ore and 87,450 lbs. lead, value $19,241; Zincite mines, 176,810 lbs. zinc ore and 4,640 lbs. lead, value $2,040; Oronogo mines, 83,810 lbs. of lead, value $1,760; Carthage mines, 71,800 lbs. zinc ore, value $807; Galena, Kan., mines, 1,020,820 lbs. zinc ore and 931,340 lbs. lead, value $31,200; district's total value, $81,438. March 13th—Joplin mines, 2,130,150 lbs. zinc ore and 224,340 lbs. lead, value $28,179; Webb City mines, 999,190 lbs. zinc ore and 35,540 lbs. lead, value $10,531; Carterville mines, 791,290 lbs. zinc ore and 75,000 lbs. lead, value $10,274; Zincite mines, 142,660 lbs. zinc ore and 4,520 lbs. lead, value $1,629; Oronogo mines, 89,720 lbs. zinc ore and 143,760 lead, value $2,872; Carthage mines, 69,000 lbs. zinc ore, value $812; Wentworth mines 45,630 lbs. zinc ore, value $456; Galena, Kan., mines, 1,443,600 lbs. zinc ore and 369,270 lead, value $22,830; district's total value $77,583. This makes a grand total for the two weeks of $179,021, but represents but nine days' work of the mines, as the last three days of the first week in March had the worst snowstorm and blizzard of the winter, preventing all out-door work at the mines. Since that time the weather has cleared up. One marked feature of the mining industry of the season is the vast amount of new development in almost every direction; that is to say, development on new tracts of land. Perhaps the most important and productive new camp is that of Spring City, located five miles due south of Joplin, and two miles south of Shoal Creek. This camp was opened by a Mr. J. W. Allen, formerly of Philadelphia, Pa. The development at Spring City has demonstrated the fact that the ore is found at a depth of 35 to 50 ft., and very late prospecting has proved the lead ore to have been found almost under the grass roots. In fact, a short time ago two prospectors commenced a shaft in the morning and in the evening had not less than 500 lbs. of lead ore piled up. Of course this was nothing but float lead found in the wash, but it proves that land south of Shoal Creek is practically of the same formation as that on the north side, and it would seem now that development already commenced will open up valuable and productive mines.

MINNESOTA.

Iron—Mesaba Range.

Lake Superior Mine.—It is reported that a controlling interest in this property, owned by A. J. Trimble, Frank Hibbing and others, has been sold to the Wetmore-Merritt syndicate, which also controls the Duluth, Mesaba & Northern road; 51% of the stock was purchased and $250,000 in cash was paid. This gives the syndicate control of all four of the centers of ore deposit on the Mesaba range.

Mountain Iron Company.—This company is employing two steam shovels in stripping. About 100 men are now employed.

New England Iron Company.—This company is now raising 200 tons of ore per day, with a force of 42 men; 1,500 tons are on the stock piles. The drift at bottom of No. 4 shaft is now in about 30 ft. each way.

Olive Mining Company.—Active work has been commenced under charge of Captain Florida, of the Mesaba Mountain mine. The test pits show good ore.

East Vermilion Range.

(From an Occasional Correspondent.)

Gun Flint District.—Great activity has been going on for the last six or seven months in the northeastern part of Minnesota. Excellent iron ore in large quantities was found here years ago, but nothing could be done with it on account of lack of transportation facilities. Early last year, Mr. K. Kortgaard, president of the Minneapolis State Bank, and other capitalists succeeded in making certain arrangements with the Port Arthur, Duluth & Western Railroad, in consequence of which the road was extended to the Canadian frontier, and a new company built an extension into Cook County, Minn. The present terminal is on Section 29, township 65, range 4 west, making the railroad distance to deep water at Port Arthur about 95 miles. The railroad companies have granted the Kortgaard-Paulson syndicate very favorable conditions for handling the ore, and the Canadian government very promptly granted facilities for shipping through the province in bond. Ore can thus be shipped to Cleveland or any other Lake port direct from the Gun Flint district on terms equal to any that Duluth or Two Harbors can afford. The Gun Flint Lake Iron Company, a corporation controlled by John Paulson, K. Kortgaard and some Chicago capitalists, owns about six miles on the iron range, the entire length of which contains fine Bessemer ore, running all the way from 60 to 68% iron, low in phosphorus and free from titanium. A town by the name of Gun Flint is now being laid out at the railroad terminus. Mr. Paulson has been superintending a large force of men for the last six months, and is now mining excellent ore on sections 27, 28, 29 and 30. The railroad will be extended to section 30 this summer.

MONTANA.

Beaverhead County.

Jay Hawk Mining Company, Limited.—The latest report states that the vein at the lowest level is 8 ft. wide, and runs rich.

Jefferson County.

Elkhorn Mining Company, Limited.—From Manager Molson's report for January it is learned that on the 1,050-ft. level, south, the vein is 4 ft. 6 in. wide, and has both smelting and milling ore. The former is 2 ft. wide and assays 70 oz. silver and 8% lead. The balance of the vein assays 45 oz. On the 1,150-ft. level, south, the south end of the main stope has 3 ft. of 30-oz. dry ore. The vein in the center back stope is 5 ft. wide, and assays 45 oz., exclusive of the smelting ore, which occurs in irregular bunches and bands. On the 1,250-ft. level, south, in the north end of the main stope the vein is 4 ft. wide, and assays 40 oz. In the center stop it is 9 ft. wide and assays 80 oz. silver and 10% lead. The south end has 6 ft. of ore, assaying 45 oz., in which bunches of high-grade sulphide are found. In the 1,350-ft. level, south, the vein in the center of the main stope is 10 ft. wide, and assays 45 oz. On the footwall there is a band of smelting ore 15 in. wide, assaying 80 oz. silver and 10% lead. In the 1,450 ft. level, north, the vein is 6 ft. wide and assays 60 oz. Prospecting has been carried on in the following levels: 1,150-ft., north drift, 58 ft., making total length February 1st 198 ft., the face still in sandrock; 1,450 south drift, total length February 1st, 659 ft. The extension of the drift did not develop anything new. Shaft sunk in January, 75 ft.; depth February 1st, 1,643 ft. 3 ins. The contact shows the same general character as in the previous lifts; 1,252 tons of ore were hoisted, of which 380 tons were smelted. The January mill work was as follows: dry ore panned, 883 tons, average assay value, 39.67 oz.; per cent. saved, 92.9%; fine silver produced, 34,475 oz.; fine gold, 33.57 oz.; value of bullion shipped, $28,500; value ore shipped, $21,231; current expenses, $25,765; January profit, $23,966.

Silver Bow County.

Alice Gold and Silver Mining Company.—Heretofore the mills of this company have worked no ore except that from its own properties, but the company is now doing custom work, and since January 1st it has crushed many tons of ore for leasers and small mines. The Alice company handles ore of a very low grade successfully, and the prospect is that the old mill of 20 stamps will be started up in a month or less to do custom work exclusively. This will no doubt start up many mines that are now lying idle because the owners or would-be lessees have not been able to get the ore treated, says the Walkerville "Telegraph."

Anaconda Mining Company.—The company commenced work on some of its properties on March 6th, and others will be started soon, and shipments made to the smelter at Anaconda as soon as possible. When running full time the company will employ about 910 men.

Anaconda Mining Company.—Ore is being hoisted at all of the properties, with the exception of the Modoc; 200 men are employed at the Green Mountain and Wake Up Jim, and 150 will be put to work during the next week. Sinking is in progress at both mines.

Butte.—The Butte "Miner" gives the following estimate regarding the number of men employed by Butte mining companies: Anaconda Mines, 900 men; Boston & Montana mines and smelters, 800; the Butte & Boston, 500; Colorado, 300; Parrot, 300; Moulton mine and mill, Butte Reduction works, Original mine, Black Rock mine, Colusa-Parrot mine, Black Chief, and half a dozen others owned and operated by W. A. Clark, 900; Lexington, 250; Alice mine and mill, 300; at the 50 other smaller properties, being worked under lease and by their owners, 2,500.

Silver Horn.—This mine has been closed down, although according to report only temporarily. The tunnel is in 400 ft.

Tiger Mining Company.—At present five men are stoping, taking out about two cars per week. The upraise is now up 55 ft., and as the ground is getting softer, will soon be completed.

NEVADA.

Storey County—Comstock Lode.

The following Comstock mining companies report having had balance cash on hand March 1st, with the mine expenses for February to be paid: Andes, $18,595; Alta, $13,279; Alpha, $5,232; Best & Belcher, $12,786; Bullion, $3,956; Caledonia, $3,266; Consolidated California & Virginia, $37,850 in cash here and in Virginia City, a clean-up shipment of bullion, amount unknown, to be received and a large portion of the month's expenses to be paid; Consolidated New York, $8,763; Confidence, $820; East Sierra Nevada, $6; Exchequer, $3,610; Gould & Curry, $6,668; Hale & Norcross, $21,204; Kentuck, $2,184; Lady Washington, $5,217; Mexican, $4,262; Sierra Nevada, $3,545; Scorpion, $2,644; Seg. Belcher, $5,220; Silver Hill, $351; Utah Consolidated, $311; Union Consolidated, $965. The following mining companies report having had an indebtedness March 1, 1893, with the mine expenses for February to be paid: Belcher, $25,937; Chollar, $8,319; Crown Point, $3,199; Challenge Consolidated, $4,845; Consolidated Imperial, $6,638; Occidental Consolidated, $910; Ophir, $18,128; Overman, $3,874; Potosi, $21,657, with February expenses to be paid; Savage, $14,395.

The amount of money disbursed by the Comstock mining, milling and other kindred companies for labor for the month of February last was $105,-

338, and was the smallest for any month for many years.

Belcher Mining Company.—The latest official weekly letter says: There is on hand at the mine about 300 tons of fair-grade ore, and about 20 tons of ore of fair quality is being hoisted daily. This ore will be shipped to the mill for reduction in a few days.

Consolidated California & Virginia Mining Company.—Superintendent D. B. Lyman writes to president C. H. Fish to explain why the ore shipped during the past fiscal month to the Morgan mill was worked to such a low percentage. The average battery assay of 2,938 tons of ore worked was $27.21 per ton, and the average assay value of the bullion returned was only $17.28 per ton, or at the rate of about 63½% of the average battery assay value. Superintendent Lyman says that this poor working was due to the ore being partly fillings taken from the old stopes, and containing chips of old timbers which could not be separated from the pay. All this material came from the mine in a very wet condition, having been saturated with water that had been poured into the old stopes to extinguish the recent fire. Now, under its contract with the Consolidated California & Virginia Mining Company, the Comstock Mill and Mining Company, owning the Morgan mill, guarantees to return in bullion 70% of the average battery assay value of the ore. The Comstock Mill and Mining Company, of which John W. Mackay and James L. Ford are the principal stockholders, on learning of the poor work done last month, promptly instructed Superintendent Lyman to reimburse the Consolidated California & Virginia for the 6½% loss. The loss amounts to between $3,500 and $4,000, and it will probably be deducted from the mill bill.

Crown Point Mining Company.—The latest official weekly letter says: The west cross-cut from the southwest drift, 150 ft. south of the shaft on the 400-ft. level, is out a total distance of 350 ft. The face is in a mixture of quartz, clay and porphyry, with spots of pay through. The stope above the 160-ft. level shows no change of importance since last report.

Hale & Norcross Mining Company.—The annual meeting of this company was held at San Francisco on the 8th inst., with a representation of 107,800 shares. Of the old board of directors A. G. Gurnett and W. H. H. Hart retired in favor of John W. Twiggs and Herman Zadig, the other old directors, viz., Natt T. Messer, George R. Wells, C. H. Fish, W. S. Lyle and W. Edwards, being re-elected. Nat T. Messer was re-elected president; George R. Wells, vice-president; A. B. Thompson, secretary, and Joseph R. Ryan, superintendent. During the meeting a resolution to remove W. H. H. Hart from his position as attorney for the company was laid on the table, and a petition from W. T. Baggett and attorney McKisick asking the company to advance them $3,000 was received and discussed, but not approved by the directors.

Potosi Mining Company.—At the annual meeting of this company at San Francisco on the 8th inst., 100,471 shares were represented. Three members of the old board of directors, A. W. Rose, Jr., W. E. Sells and C. T. Bridge, resigned, and Thomas Cole, Thomas Anderson and D. C. Bates were elected in their places; the other members being A. K. P. Harmon and Emmett Barrett, of the old board. A. K. P. Harmon was elected president; Thomas Cole, vice-president; C. E. Elliot secretary, and A. C. Hamilton, superintendent. The company has a present indebtedness at bank of $30,067. During the year bullion of the gross assay value of $385,061 was produced from 19,214 tons of ore, being an average of $20 per ton. The discount on the silver portion of the bullion was $91,774, leaving net returns of $293,287. Deducting $115,284, which was paid for milling ore, there was left net returns of $178,007 to help defray the running expenses.

Savage Mining Company.—The latest official weekly letter says: We hoisted 254 cars of ore from the 1,100, 1,400 and 1,450 levels. Shipped to the Nevada mill 232½ tons, and milled 160 tons. Average car sample assay, $17.64; average battery assay, $17.63; bullion yield for the week, $1,974.40. Shipped to the United States Mint at Carson, March 3d, 417½ lbs. of crude bullion. On the 950 level, the east cross-cut from the 8th floor is advanced 33 ft.; face is in pay ore. Have started a north drift at the top of the upraise from the sill floor and advanced some 18 ft.; face in quartz and porphyry. On the 1,100 level, the north prospecting drift from the 16th floor is advanced 54 ft.; face in quartz and porphyry. The south prospecting drift from the 15th floor is advanced 30 ft.; face in quartz and porphyry. On the 1,030 level we have started an upraise in the vein from the west cross-cut. On the 1,400 level the east cross-cut from the north drift started 50 ft. north of the ore stope is advanced 105 ft.; face is in porphyry. The west cross-cut from the north drift is advanced 24 ft.; face in quartz giving low assays. On the 1,450 level we continue to stope ore upward from the end of the west cross-cut, started 100 ft. from our south boundary. Have not shipped the usual quantity of ore during the week, as the quality has deteriorated.

(From our Special Correspondent.)

The mining assessments in this state falling delinquent during March aggregate $137,400.

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, the car and battery assays, bullion product and bullion shipped:—

Mines.	H'st'd Tons	Car assay.	Mil'd. Tons.	Bat'ry assay.	Bullion for week.	Bullion Shipped.
Belcher..	140	.....	.....	.....	.. ...	.....
C. C. & Va.	[1]561	28·52	970	26 06	....	{[3]$23,351 50 / [4]$27,443.50}
Justice....	56	20·	.....		.....	.....
Potosi.....	459	26 15	400	26 14	.....	[5]347 lbs.
Savage....	[2]251	17 64	160	17 63	1,974,40	[6]417½ l's.

[1], [5] Cars. [2] Shipped to San Francisco. [3] Shipped to Carson Mint. [4], [6] Crude bullion.

Challenge Consolidated and Confidence Mining Companies.—Small quantities of ore are being found on the upper levels, which is being hoisted and sent to the Brunswick mill for reduction.

Ophir Mining Company.—The hoist engine and other machinery on the 1,465 level are in position, and the work of sinking may begin at any moment, but it is probable it will not be commenced until Mr. Mackay arrives on the Comstock.

West Consolidated Virginia Mining Company.—The suit now on trial before Judge Slack, in Department of the Superior Court of California, has fizzled out. When M. W. Fox, the defendant, was called as a witness, his testimony related principally to the manner in which he obtained control of the property. From Sam Curtis he obtained the idea that the claim by Steel was valuable. He formed a combination with Brown, believing him to be a wealthy man, and in that belief the West Consolidated Virginia Company was formed, and the plan arranged to gain control of the Andes mine adjoining. As a practical miner he knew that $500 worth of work from the Andes side of the property was more valuable than the expenditure of $2,000 worth of work in the West Consolidated Virginia ground. At the time Brown retired from the presidency of the Andes company, witness distrusted him, and asked him to deliver up the stock in the West Consolidated pool. Brown replied that he had no faith in either Curtis or Steel, or believed that there was any ore in the mine, and that Fox or anyone else could have the stock upon reimbursing him for his outlay. Angry words passed, but finally Fox contrived to so arrange matters that he got the stock and paid Brown for his outlay. Later, upon examining the certificates, he discovered they represented less stock than he had receipted for, but at the time he thought little about it. He was anxious to get the majority, and so the 75,500 shares contented him.

Attorney Morgan replaced Steel on the stand for the purpose of examining him regarding a telegram received by him from Deal, a well-known attorney on the Comstock, at the time the arrangement between Fox and himself was about to be made, and by which, he now alleges, he has suffered so much loss. Steel identified the telegram, stated that Deal was his attorney in Virginia City, and that he had acted upon the advice given in the telegram to "agree to the arrangement," and furthermore, that Deal himself owned a one-tenth interest in the West Consolidated Virginia mine.

White Pine County.

(From our Special Correspondent.)

The Joanna Mine, Ely.—It is reported that this property has been sold for $100,000 to Montana capitalists. The mine is to be fully developed, and mills, hoisting works, etc., erected.

NEW MEXICO.

Grant County.

Brockman.—This mill at Lone Mountain is turning out about 1,500 oz. of silver bullion a week, and is now the only mill in this county which is producing silver in any considerable quantity.

Manhattan Gold Mining and Milling Company.—Another assessment has been levied on the capital stock of this company to complete the tunnel, which is being driven to the main vein on the company's property. When work was commenced on the tunnel last summer it was expected that it would be finished by this time, but the extreme hardness of the rock for over 200 ft. of the distance retarded the work so that it will not be completed until the end of this month. The tunnel is being driven under contract at $14 a foot.

Sierra County.

Mamie Richmond.—This mine, in the Hillsborough district, is being worked again, and starts off with an output of 30 tons. The mine has been worked for a number of years, but the results which have been obtained within the past three years have not been very satisfactory. The mine has been developed to a depth of more than 300 ft., and a tunnel is now being driven to the old shaft.

Socorro County.

Graphic.—A dispatch from Santa Fe states that the Graphic group of silver mines, consisting of five patented claims at Kelley, in the Magdalena district, has been sold to Terre Haute, Ind., parties. The consideration is not stated.

PENNSYLVANIA.

Coal.

A press dispatch from Hazleton states that the recent rain is causing much trouble in mining operations in that section, and March 13th nearly all of the collieries were obliged to shut down, owing to the inability of their pumps to hold the water. About 1,600 men and boys are now idle. The collieries of Cranberry, Highland and Hazle mines are completely flooded.

Rainbow Coal and Coke Company.—An explosion of gas occurred at the Whitsett mine of this company, at Perryopolis, on the 13th inst., and five miners were fatally burned.

Philadelphia & Reading Railroad and Philadelphia & Reading Coal and Iron Company.—The statement of the receivers of these companies has been made public. It is signed by all of them and contains a complete account of the floating liabilities and assets of the company, so far as the receivers have been able to discover them after a careful examination. The total debt outstanding on February 20th, 1893, was $9,867,347, in addition to amounts due for coal purchases, rentals, supplies, wages, etc., bringing the total floating liabilities up to $18,472,838. The total current assets in the way of coal and money due for coal, freight, etc., are put at $15,779,784, leaving a deficiency of $2,693,043.

The receivers gave for publication the following statement of the figures: Liabilities: Floating debt, Speyer & Co., $3,000 000 secured by the following collaterals: $5,340,000 collateral trust bonds; $200,000 Philadelphia, Harrisburg & Pittsburg bonds; $1,000,000 third preference income bonds. The next item is the loan from the Pennsylvania & Philadelphia Warehouse Company, of $3,0 0 000, secured by the following collateral: $1,000,000 third preference income bonds; $440,000 collateral trust bonds; $25,000 general mortgage bonds; also coal on hand and coal accounts. Bills payable amounting to $3,867,347, secured by the following collaterals: $3,521,000 collateral trust bonds; $16,000 general mortgage bonds; $169,000 first preference income bonds; $119,000 second preference income bonds; $200,000 third prefereuce income bonds; $900,000 Philadelphia, Harrisburg & Pittsburg Railroad bonds; $600,000 Philadelphia, Newtown & New York Railroad Company bonds; $300,000 Tamaqua, Hazleton & Northern; $100,000 Tamaqua Trust bonds; $44,000 Coal Hill Trust bonds; $106,000 Ely & Rienle bonds; $200,000 Montour Railway and Steamship Company; 1.4 4 shares Twelfth Street Market stock. The floating debt outstanding February 20th was $9,867,347.

In addition the statement shows as follows: Due for coal purchases, $1,476,156; due for material, supplies, royalties, etc., $2,6-0,691; due connecting roads for freight and tolls, car service, etc., $751,033; due for rental of leased lines, taxes, etc., $1,055,249; due on unpaid coupons and interest, $544,353; unpaid wages of January, 1893, $748,000; accrued wages of February, 1893, to date, $1,350,000; total, $18,472,828. The assets are given as follows: Approximate value of coal on hand, 1,107,839 tons at $4.50 a ton, $4,085,276; due by sundry parties for coal sold on 30 and 60 days, $5,291,829; material on hand, $1,933,443; due for freight and tolls, $2,150,000; due by sundry parties on account of coal business, $300,000; due by connecting roads, $1,000,000; bills receivable, $89,995.76; cash, $29,240.88; grand total of assets, $15,779,784. Recapitulation—total liabilities, $18,472,828; total assets, $15,779,785.49. Excess of current liabilities over assets, $2,693,043 60. Some of the above amounts are approximated, but they will not vary greatly from the actual figures.

West End Coal Company.—The large coal breaker of this company, at Mocanaqua, was totally destroyed by fire on March 12th. The engine house and machine shops were saved. About 500 men and boys were thrown out of work by the disaster.

Schuylkill County.

The Pottsville "Chronicle" says that Scranton capitalists for some time past have been buying up coal lands in Schuylkill County. H. C. Russel, of Pottsville, has sold the coal reserve of the Navigation tract, lying north of Pottsville, in the Fishbach district. The tract contains 321 acres, and is underlaid with all of the coal measures north of the Gate vein anti-clinal. The pitch is toward St. Clair and the coal reserve line extends beyond the Odd Fellows' Cemetery, and adjoins the Philadelphia & Reading Coal and Iron Company's lands on the north. Mr. Russel, in the estate, represented the Starr, Biddle and Benson estates, and James W. Paul, the original owner of the tract. The consideration for which the land was sold was $192,600, or $600 per acre. The Shippen-Wetherill tract of 300 acres of coal land, in the lower Schuylkill region, near Brockville, was sold March 11th for $200,000, to a syndicate of Scranton capitalists.

Oil.

The statement of the various pipe lines for February shows a decrease in net stocks of 221,363 barrels, a decrease in runs of 53,147 barrels, and a decrease in regular deliveries of 369,098 barrels. Buckeye runs decreased 74,834 barrels, deliveries decreased 36,017 barrels, and net stocks decreased 295,690 barrels.

The exports of mineral oil for February, 1893, amounted to $2,659,810, against $3,217,578 for the same period of 1892. The exports of the first eight months of the fiscal year 1893 amounted to $27,591,316, against $30,515,596 for the same period of 1892.

The Crescent Oil Company's pipe line, which passes through the lower end of Huntingdon County, was blown up with dynamite three miles

west of Saltillo on March 12th. Before the break was discovered several thousand barrels of oil had escaped and ignited. The perpetrators are unknown.

SOUTH DAKOTA.

Lawrence County.

Custer Peak District.—According to the Deadwood "Pioneer" a large amount of work is at present being done in this district. A shaft is down on the St. John property over 100 ft., and a cross-cut of 50 ft. has been made showing a large vein of gold ore, which goes from $7 to $35 per ton.

Deadwood & Delaware Smelter.—It is expected that the new smokestack will be furnished by April 1st. When this stack is completed the matte stack recently built will be "blown in," says the Black Hills "Times." The plant at present with one stack is handling 60 tons of ore daily. The ore comes from the Two Bears, Sonora, Calumet and Carthage properties, owned by the company.

Hawkeye Mining Company.—At the mill 25 stamps are running, the other 15 being hung up on account of breakages. The tramway is unable to carry enough ore to keep all the stamps supplied.

Horseshoe.—The work of sinking continues uninterruptedly. The shaft is now down 330 ft. Lately, the shale changed into sandstone. Water, which heretofore has not hampered the work, is gaining steadily.

Imogene.—Development work on this property, near Perry, is progressing satisfactorily, and three veins of free-milling gold ore have been exposed.

Pennington County.

Black Hills Mining and Smelting Company.—According to the Rapid City "Republican" Judge Gardner has ordered the Welcome Chlorination Company to restore its mine to the above-named company.

TENNESSEE.

Tennessee Coal, Iron and Railroad Company.—Mr. Thomas C. Platt has resigned the presidency, giving as his reasons lack of time and an understanding that when the company should acquire the Bardaleben and Cahaba companies' properties the management should pass to the Southern interest in the company. It is understood that Mr. H. de Bardaleben will succeed Mr. Platt.

This company is considering the question of establishing works on a large scale for making steel by the Talbot open-hearth process. It is stated that the Talbot patent has been offered to the company, and an option on it till April 4th has been taken.

Sullivan County.

Shady Valley.—A syndicate of English capitalists has purchased 62,000 acres of land in the Shady Valley, a few miles east of Bristol, for $600,000. The tract is said to be rich in iron ore and manganese.

UTAH.

Juab County.

Anchor Mining Company.—This company has levied another assessment of 20 cts. per share, payable March 27th. The "Park City Record" says that it is expected that this will be the last.

Bullion Beck Mining Company.—The attempt of Mr. Hyde, the manager, to work the mine, has failed so far. On March 9th some 40 non-union men were taken to the mine from Salt Lake City, but were met at the Eureka Station by the old miners and persuaded to return.

Cumberland.—In the tunnel on this group several streaks of good ore have been encountered, but it is still being driven ahead to cut the ore body that shows up in the old incline shaft.

Daly West Mining Company.—Connections have been made between this mine and the Daly by means of the drift driven from the Daly 800-ft. level. This connection obviates the necessity for pumping and taking water, which has been a considerable expense since the shaft attained its present depth.

Glencoe Mining Company.—Considerable development work is being done and some ore piled, but none will be shipped until summer.

Steele.—Development work on the group is progressing rapidly, and it is expected that the vein will soon be reached by the cross-cut from bottom of shaft.

Salt Lake County.

The Hanauer smelter has been running but one stack recently, but the second is being started, according to the Salt Lake "Tribune." The Mingo Smelter, at Sandy, has started up more furnaces and roasters. The company was running three stacks, and have increased their number.

Bingham.—There are more men leasing in this place at the present time, says the "Bingham Bulletin," than for years past, and all seem to be doing well. At the Northern Chief a tunnel has tapped the vein at a depth of 120 ft. Twenty men are employed and regular shipments are being made.

Summit County.

Park City Sampling Works.—These works, owned and operated for the past 15 years by Richard Mackintosh, of Salt Lake City, took fire, and were completely destroyed March 9th. The loss is considered to be $25,000, while the insurance is $14,000 or $15,000.

VIRGINIA.

Wythe County.

Pennsylvania Mining Company.—This company has begun mining operations on its tract along New River, near Ivanhoe, on the Cripple Creek branch of the Norfolk & Western Railroad. For the present both zinc and iron ore will be shipped, but a zinc furnace is to be put up soon.

WASHINGTON.

Bellingham Bay.—This coal mine, which underlies that part of Whatcom formely known as Sehome, has been discovered to be on fire after being abandoned for 16 years. At that time the waters of Whatcom Creek were turned in the main shaft and the fire supposed to be drowned out. For several days smoke has been arising from the shaft. The Cornwall Coal Company is making an effort to smother the fire. This is the oldest coal mine on the coast.

WEST VIRGINIA.

Coal.

Inspector Haar's report for the First mining district shows an increase in the production of coal for 1892 of 282,283 tons, or a total of 2,427,662 tons; while the total coke production is 348,225 tons, an increase of 33,467 tons. The total number of men employed in the district is 4,087.

WYOMING.

Coal.

Towner.—The shaft of this mine is down 55 ft. The coal is proving of satisfactory quality.

Albany County.

(From our Special Correspondent.)

Coal.—On account of the attitude of the Union Pacific on the coal question, people in self-defense have been compelled to prospect for coal in this immediate vicinity. Mr. B. W. Towner, at the head of Mill Creek, and a J. W. Brown, on Dutton Creek, have both opened up coal mines, and are now hauling coal from 25 to 33 miles by team to Laramie, as well as supplying all near-by ranchmen. The feeling in favor of a railroad to the mines is very strong.

FOREIGN MINING NEWS.

AUSTRALIA.

The advance statistics of the gold production of the Australian colonies during 1892, as given by the "Australian Mining Standard," are as follows:

	1892. Ounces.	1891 Ounces.
Victoria	654,457	576,399
Queensland	602,758	576,758
New South Wales	144,259	142,470
Tasmania (estimated)	50,000	40,000
West Australia (estimated)	50,000	15 000
South Australia (estimated)	10,000	10,000
Total	1,511,474	1,360,627

The increase in the Victorian output is due to the developments at Bendigo and to the steady output at Ballarat. New South Wales has just held its own, and Queensland has advanced 26,000 oz. Western Australia has also made a marked increase. The estimate of South Australia is low, but the yield of Tasmania is placed a little above what it was last year.

BRITISH COLUMBIA.

Duluth & St. Paul Mining Company.—This company has been incorporated to engage in a general mining and smelting business, with headquarters at St. Paul and an office in Ainsworth, B. C. The capital stock is $2,000,000.

Slocan.

Idaho.—According to the Spokane "Review" a good body of ore has been struck in the lower tunnel, about 125 ft. deeper than the present workings. The ore is of shipping grade.

Young Dominion.—At this mine, a half mile distant from the Idaho, ore has been discovered. The tunnel is in 125 ft. The vein is 12 ft. wide and contains 12 to 20 ins. of clean ore, the rest being good concentrating ore.

CHILI.

Nitrate.—A cable dispatch says that a law has been passed by the Chamber of Deputies compelling the President to sell within three years the nitrate lands owned by the government of Chili and which they acquired by conquest from Peru. The proposed sales are to be advertised in London, Paris, Berlin and New York.

Rosario Nitrate Company, Limited.—The fourth annual general meeting of the shareholders in this company was held in London, February 27th. The chairman stated that during the 15 months covered by the report the company had disbursed £127,720 in the sinking fund for debentures. During the same time the total gross profit was £148,000, while the works had only been going half time. He said that some years ago the nitrate trade had drifted into an unhealthy condition. The total consumption was something like 800,000 or 900,000 tons per annum, whereas the productive capacity of the whole of the works on the west coast was fully half as much again. The result was that the selling price dropped to a ruinous figure and it became necessary to restrict production. Simultaneously arrangements were made to push to the utmost possible extent the use of nitrate all over the world. The combination to restrict expires in 1894.

ENGLAND.

Coal Miners and Wages.—The Durham miners have received notice from the employers, making application for a 10% reduction in wages. The Associated Coalowners in the counties of Fife and Clackmannan announce that the wages of miners in their employment will be reduced 12½%. The reduction will be calculated on wages current in 1888, and will be equivalent to about 10% on current rates. Many of the Durham collieries are closed on account of the slackness of orders, but the miners oppose the cut in wages, preferring short time.

London Chamber of Commerce.—At the next meeting of the Mining Section two important resolutions will be introduced. One is that the Mining Section should issue a quarterly sheet showing returns of all English companies working mines in foreign countries, and the other "that a joint committee of members of the Mining Section of the London Chamber of Commerce and of the Institution of Mining and Metallurgy should be formed to consider the expediency of taking steps to promote the holding of an International Exhibition of Mining and Metallurgy in London, 1894."

Mining Boards.—It is proposed to introduce a bill into Parliament which will provide for the establishment of district mining boards composed of representatives of miners and owners in equal numbers. These boards are to have power to make by-laws regulating the hours of labor in mines, and to inforce penalties for breaches of such laws.

Miners' Federation.—At a meeting held at Birmingham, England, March 1st, this body negatived the recommendation of the Executive Committee for a four weeks' stoppage in all mines. The conference also negatived by a large majority the resolution that the necessary regulation of the coal trade could be best carried out by working not more than four days a week. During 1892 the Federation adopted the plan of a miners' holiday for the purpose of decreasing stocks of coal and maintaining the price of coal and wages. The plan was successful to a small extent only, although it was aided by the great Durham strike.

FRANCE.

Coal.—The coal production of the Pas de Calais for 1892 was 9,822,514 (metric) tons, an increase of 1,210,888 tons over 1891. In 1892 there were 55 collieries at work. In 1892 the Bassin du Nord produced 4,875,963 tons from 42 collieries, a decrease of 69,546 tons from the preceding year.

GERMANY.

The output of the government coal mines of the Saar during January, 1893, was only 319,545 tons, or about 200,000 tons less than the average.

During 1892 the coal output of Prussia amounted to 65,395,721 tons, a decrease of 2,118,529 tons compared with 1891. During the same period the number of workmen increased from 251,559 to 257,636, an increase of 6,077, showing that the effective work per miner has decreased.

INDIA.

The Deccan.

Hyderabad-Deccan Company.—A report just issued by this company states that the total sales of coal at the Singareni collieries for the year ended June, 1892, amounted to 121,887 tons, as against 104,766 tons in 1891. The receipts in rupees were greater, yet, owing to the fall in the exchange, the proceeds converted into sterling were less. Operations continue to indicate an ample supply of coal. Prospecting has been carried on vigorously, and applications have been made to the government for the leases of various tracts of land, including coal, gold, diamonds, iron and copper. Further underground operations have been carried on throughout the 12 months, with encouraging results in the Raichur gold tracts, but in the Partyal diamond fields prospecting has not been satisfactory.

MEXICO.

New Pinos Altos Mining Company.—This company has been registered in London, with a capital of £160,000, its object being to acquire the mining rights and undertakings of the Pinos Altos Bullion Company.

Santo Niño Mining Company.—This company has been registered in London, with a capital of £25,000, its object being to acquire and work mines in Mexico.

Coahuila.

Sierra Mojada.—La Fortuna mine is reported to be shipping 1,500 tons per month to the Monterey smelter.

Durango.

The concession granted to Mr. Carlos Eisenman for the construction of a railway from Marquez, on the Mexican Central, to Zimapan, a distance of over 100 miles, has been declared forfeited on the ground that the stipulations of the concession have not been complied with. The concession carried a subsidy of $8,000 per kilometer, and some 23 kilometers of the road have been constructed.

Guanajuato.

I found two concerns in Guanajuato handling ore for shipment, and although they reported business quiet, they seemed to be handling a fair tonnage. It would surprise an ore buyer in the States to see how a "rescate" (ore buying agency) is run in Mexico. In the morning, about seven, there is a motley collection waiting for their turn to have their ore weighed. The lots vary in size from a hatful to one thousand pounds, which is a large amount for a Mexican to have at one time I noticed some of the miners had their families all packed with loads as well as their burros. The ore is weighed in pounds and kilos, sampled, assayed and settled for in one day, so you can see that a considerable work is done in a short time. There is no machinery used in the mill, the ore all comes in broken up as fine as peas, and it is simply quartered down to a tomato can full and this is rubbed down to a pulpon a large flat granite stone and sent to the assayer. It does not pay an ore buyer to assay himself as he can have gold and silver assays made for 25 cents, Mexican money. Everything is settled for in "marcos," about eight ounces, and the weights figured in "cargas" (the "cargas" vary from 300 to 350 lbs. in the different camps).

Some of the largest producing mines in the vicinity of Guanajuato are the Raices, in Guanajuato district, Jesus Maria, San Pedro, Refugio, Rosario, La Huilota, in the La Luz district, and the Mina de Augustas, Santa Brigida, Garabaldi in the Pozos district. The ore is mainly dry, running high in silver and some gold. Most of the specimens I saw were ruby silver and some sulphide. Part of the ore shipped out goes to El Paso and the balance to Monterey, Mexico, although some shippers claim they can do better shipping to Europe. If the Mexican Central could understand the difference between a long and short haul I think all the Guanajuato tonnage would come to the States for reduction.

Guerrero.

Huitzuco Mines.—This property is now turning out about 100 tons per week, and 250 men are employed. The unassorted ore is said to run 49 oz. of silver per ton.

Hidalgo.

(From our Special Correspondent.)

The typhus fever, which has been raging for several months, has seriously impeded work, as most of the people who could afford to leave have done so, and the ones remaining do so at the risk of their lives, as there are no sanitary arrangements at all. I found a large amount of work being done in the mines in Pachuca, in spite of the low price of silver and high cost of living (on account of the failure of crops for two years). The Real Del Monte mines are extracting and shipping their usual tonnage of high grade ore to Europe. Mr. M. P. Boss has built a mill in Pachuca, and I understand he has made a success of his continuous system there. Among the producing mines can be mentioned the Peregrenos mine, of Real Del Monte, La Zorra, El Carmen, and Armistad and Concordia mines, all in Pachuca district.

Pachuca.

La Redenciou Mine.—A small quantity of rich ore is being extracted from a winze in the lower level.

San Felipe de Jesus Mine.—The Escobar lode has been cut in good milling ore. The north crosscut to the Santa Brigida lode is still uncompleted.

Santa Elena Mine.—This mine is reported absolutely barren.

San Luis Potosi.

Hacienda Concepcion del Oro y Auexas.—This company is about to purchase 60 more stamps and a 250 H. P. Corliss engine. This inereased plant will, it is expected, he erected by June 1st.

Zacatecas.

Cabezon Miue.—This property is being worked by an American company, of which Alexander Sanger is president; Frank Cockrell, vice-president; J. P. Murphy, secretary, and A. J. Porter, manager. The capitalization is $480,000 gold. The ore contains silver averaging 25 oz. per ton, with a trace of gold. For some years past, the company has been opening up the mine, but now it is beginning to pay, says the "Mexican Trader." The richest ore is shipped to the United States, and the remainder is treated atthe mines by the patio process. The shaft has a depth of 500 ft.

POLAND.

The Dombrova coal fields are now being worked by a French company which is trying to introduce the coal into St. Petersburg. The London "Mining Journal" says that if the experiment succeeds English coal exports to St. Petersburg will cease.

QUEENSLAND.

Heberton Tiu Mining Company.- The tinstone crushed during the last quarter amounted to 2,040 tons, yielding 334¼ tons block tin. The total output for the year was 1,323 tons of block tin.

Mount Morgan Gold Mining Company, Limited.—It is reported than an ore body six feet wide has been struck in the Crown shaft at a depth of nearly 800 ft.

REPUBLIC OF COLOMBIA.

(From an Occasional Correspondent.)

Colombian hydraulic mining is played out owing to the adverse legislation upon the débris question, and, with the exception of two mines, all are shut down. Mr. Russell is now superintendent of the Frias (Tolima) property, J. G. Green having been in England since November. It is said he will soon return. The output is about $55,000 monthly. Malpaso is doing well. These are the only mines in operation.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see page 264.]

NEW YORK, Friday Evening, March 17.

The week which has just passed at the Consolidated Stock and Petroleum Exchange has developed nothing new or interesting in the mining stock market. There was the same lack of features and the small volume of business which we have been reporting in this column for several months past.

The Comstocks have been quiet and featureless. There was some inquiry for Consolidated California & Virginia and for Ophir, but on the whole the demand has been small. Of Consolidated California & Virginia only 200 shares were sold at $2.55@$2.60. Ophir shows sales of 400 shares at $1.80@$2. Sales of Savage aggregated 500 shares at 65@79c. Comstock Tunnel was weak and closed at 11c.; total sales aggregated 400 shares. Other sales were as follows. 200 shares of Best & Belcher at $1.50@$1.60, 100 shares of Chollar at 70c., 450 shares of Mexican at $1.65@$1.85, 325 shares of Union Consolidated at 90@95c. The monthly financial statements of the various Comstock mining companies will be found in our mining news columns.

Of the California stocks Brunswick Consolidated shows sales of 3,800 shares at 5@6c. The superintendent of the Brunswick Consolidated Gold Mining Company writes as follows from Grass Valley, under date of the 8th inst.: "Work has been going on steadily at the mine during the past week. The ground is quite hard in both drifts. There is a little more quartz showing in the east drift, but no settled ledge. In the west drift there is no change. The east drift was extended six feet and the west drift five feet."

The product of the Standard Consolidated Mining Company's property during the month of February amounted to $13,400, and the expenses for the same period were $12,150, leaving a profit of $1,250. This comparatively poor showing was due to the fact that a body of low grade ore was struck. Late advices state that the mine is yielding better. During the past week there were sales of 700 shares of the stock at $1.50 to $1.55. Of Belmont, 400 shares were sold at 22c. to 23c. Quicksilver, common, had a solitary transaction of 100 shares, at $2. Plymouth Consolidated shows sales of 550 shares, at 75c.@$1.

Mr. P. T. Farnsworth, Manager of the Horn Silver Mining Company, writes from Frisco, Utah, to the president of the company under date of the 1st inst.: "Everything is going on very nicely here. The mine is looking well in all its stopes and the quality of the ore is good. We have never had a better showing since I came here than we have to-day, both for quality and quantity. There are no new developments of importance. We have favorable ground both in the 1,100 north drift and in the 700 north." The directors will meet on Monday next to declare the regular quarterly dividend of 12½c. per share. During the past week there were sales of 200 shares at $3.20. Ontario was very quiet this week, only 10 shares being sold at $15.

Of the Colorado stocks, Leadville Consolidated was quiet, only 600 shares being sold at 18@19c. There was a single sale of 100 shares of Breece at 30c., and one of 200 shares of Little Chief at 20c. Of Robinson Consolidated 100 shares were sold at 35c. Chrysolite was stationary at 21c., with sales of 300 shares.

Of the Black Hills stocks the only one which was dealt in during the week was Caledonia, of which 410 shares were sold at 90c.@$1.

There were no sales of Phœnix of Arizona this week. The plans of the Reorganization Committee of the Phœnix Mining Company will be made public very shortly. In our next issue we shall probably give an account of them.

Sales of El Cristo this week amounted to 10,200 shares at 44@51c., and of Monte Cristo 2,000 shares at $3.15@$3.20.

Boston. March 16.

(From our Special Correspondent.)

The market for copper stocks the past week has ruled extremely dull and inactive, with a downward tendency in prices. The speculative element seems to be entirely wanting, and the transactions are confined to a few stocks for investment. Boston & Montana sold early in the week at $31½, but later lost the fraction, touching the lowest price for the year.

Butte & Boston was also inclined to be heavy, and declined to $10, with recovery to $10¼ in to-day's transactions. Calumet & Hecla sold at $305, same as last week. Tamarack advanced on small lots to $165, with later sales at $160. Osceola was pressed for sale for some reason, and declined from $36½ to $34⅞. Franklin sold at $12¾ @ $13, and was fairly steady. Kearsarge still declines, touching $9 to-day, a loss of $1 from last week. Centennial holds fairly steady at $8@$8¼, but tnere is not so much desire to buy it as was apparent last week. Atlantic sold at $9¾, same as last report, and Allouez at 75c. Tamarack, Jr., advanced to-day from $20 to $23 on a dispatch from Houghton reporting the vein in the third level 15 to 16 ft. wide and rich.

Wolverine sold at 2½@2¾, and National appeared with sale of 100 shares at $1½. There are no reported sales of Quincy this week, but $132 is bid for the stock and $135 asked.

The market closed dull.

San Francisco. March 10.

(From our Special Correspondent.)

The fluctuations in the mining share market have not been great during the week, but the amount of trading has been small. Next week Mr. Flood, with other of the mine controllers, will leave for the Comstock, and possibly Mr. Mackay, but it can scarcely be hoped that he will have sufficiently recovered from his wound to join the party in their trip. Upon their return it is anticipated that something will be definitely known regarding the plan for resuming pumping operations. The engineers reported that it would take at least two months to make the necessary calculations as to cost, etc., but no such time is necessary to arrange for a reduction in milling and transportation costs, and a cut in the prices paid for wood and water The Miners Union have also been considering the situation, but whether a cut in wages is to be resisted or not is yet a remote point. It would seem as if the Union would not have much to say in the matter.

The monthly statements filed this week in all the company's offices make such a poor showing that assessments along almost the entire line of the Comstocks are expected. In many cases, however, the decline has been discounted.

Consolidated California & Virginia has shown a five cents decline on the week's trading, ruling at $2 45. Ophir sold to-day for $1.90; Mexican for $1.70; Sierra Nevada for $1.10, and Union Consolidated for 90 cents. All these prices are much the same as a week ago.

In the middle group of Comstock shares prices have been a shade stronger. Best & Belcher has ruled at $1.55, Chollar at 60c., Gould & Curry at 75c., Hale & Norcross at $1.15, Potosi at $1.30, and Savage at 70c Attention is being centered on Potosi on account of the improvements on the 1,000 level, which seem to indicate an ore body.

The Gold Hill and South End stocks have been the weakest on the list, and while prices have ruled less than a week ago, the volume of trade has also been smaller. Belcher has ruled at 55 cents; Caledonia at 15 cents; Bullion, 45 cents; Consolidated New York, 45 cents; Confidence, $1.20; Occidental, 10 cents; Overman, 25 cents, and Yellow Jacket at 45 cents. The decline in these stocks has ranged from 5 to 15 cents per share.

Of outside stocks Bodie has sold for 5 cents and Bulwer for 25 cents. Small lots of Mayflower have sold for 25 cents, and the remainder of the outside list have not obtained a ruling rate, being simply quoted.

SAN FRANCISCO, March 17th (*By telegraph*).—The opening quotations to-day were as follows: Best & Belcher, $1.40.; Bodie, 2 0c.; Belle Isle, 10c.; Bulwer, 20c.; Chollar, 60c.; Consolidated California & Virginia, $2.40; Eureka Consolidated, $1.50; Gould & Curry, 65c.; Hale & Noreross, $1.05; Mexican, $1.50.; Mono, 5c.: North Belle Isle, 10c.; Navajo, 10c.; Ophir, $1.85; Savage, 50c.; Sierra Nevada, 95c.; Union Consolidated, 80c. (with assessment of 25c.; Yellow Jacket, 35c

MEETINGS.

General Electric Company, at the office of the company at Schenectady, N. Y., April 11th, at 12 o'clock, noon.

Kearsarge Mining Company, at the office of the company, room 301, Sear's Building, No. 199, Washington street, Boston, Mass., March 21st, at 11 A. M.

New Tintic Mining and Smelting Company, at the office of the company, rooms 404-407 McCormick Block, Salt Lake City, Utah, April 5th, at 1 P. M.

Sloass Iron and Steel Company, at the office of the company in Birmingham, Ala., March 22d, at 12 o'clock, noon.

Tennessee Coal. Iron and Railroad Company, at the office of the company in New York, April 4th, at 12 o'clock, noon.

DIVIDENDS.

Cambria Iron Company, dividend of five per cent. payable April 1st, at the office of the company in Philadelphia, Pa.

Centennial Eureka Mining Company paid dividend No. 27, of fifty cents per share, $15,000, March 15th, at office of the company. No. 34 West Second South street, Salt Lake City, Utah.

Daly Mining Company, dividend No 73 of twenty-five cents per share, $37,500, payable 31st at the office of Messrs, Lounsbery & Co., Mills Building, No. 15 Broad street, New York.

Homestake Mining Comnany, dividend No. 176, of ten cents per share, $12,500, payable March 25th at the office of Messrs. Lounsbery & Co., Mills Building, No. 15 Broad street, New York. Transfer hooks close March 20th and reopen March 27th.

Mayflower Mining Company paid dividend of ten cents per share, $10,000, payable March 15th, at the office of the company in San Francisco, Cal.

North Star Mining Company, dividend No. 8 of 50 cents per share, $50,000, payable March 20th at the office of the company, No. 18 Wall street, New York City.

METAL MARKET.

NEW YORK, Friday Evening, March 17, 1893.

Prices of Silver per Ounce Troy.

March.	St. Ex.	London Pence.	N.Y. Cts.	Value of sil. in $1.	March	St. Ex.	London Pence	N. Y. Cts.	Value of sil. in $1.
11	4 86½	38⅞	83¼	633	15	4 85¾	38⅜	83	631
13	4 85¾	38⅞	83¼	633	16	4 85½	38⅜	83	631
14	4 85¼	38⅛	83⅛	632	17	4 85½	38⅜	83	631

Silver has been very quiet the past week. There is an absence of all speculation in the metal. Some disposition to contract amount of production shows itself, and the probabilities are, even if the price remained stationary at current rates, the result would be materially decreased output in time, as old mines would become exhausted, and prospecting is discouraged.

The United States Assay Office at New York reports the total receipts of silver for the week to be 124,000 ounces.

Government Silver Purchases.

The government has purchased during the week the following quantities of fine silver at the accompanying prices per fine ounce:

March 13th, 380,000 oz., at 83·64c.
March 15th, 300,000 oz., at 83·25 to 83·3c.
March 17th, 220,000 oz., at 83·3 to 83·45c.
Total purchases for month, 2,579,000 oz.

Gold and Silver Exports and Imports at New York for Week Ending March 11th, 1893, and for Years from January 1st, 1893, 1892.

	Gold.		Silver.		Excess of Exports.
	Exports.	Imports.	Exports.	Imports.	
Week....	$4,219 057	$1,659,693	$706,841	$116,489	$3,149 716
1893.....	30,745,405	2,623,740	5,902,065	824,356	33,181.524
1892.....	9,972,961	3,320,309	4,854,715	290,183	11,217,184

Of the gold exported but $2,300,000 went to Europe $1,150,000 in foreign coin going to Havana. This latter was imported the same week and should be classified as gold in transit.

During the five days ending March 17th the exports and imports, so far as ascertained, have been as follows: Exports, gold, $1,497,720; silver, $353,675; imports, gold, $1,309,414; silver, $8,411. Of the gold imported $1,295,030 was foreign gold coin, which was immediately re-exported to Havana. The sum of $173,000 in American gold coin was sent to Venezuela.

NOTES OF THE WEEK.

To the attentive student the present financial situation points a lesson. During the last 10 days money has commanded high rates, and sterling exchange has dropped so low that it is impossible to ship gold at a profit notwithstanding the premium paid for it by Austria and France. Brokers feeling assured that gold will not be exported, complain of the interest that must be paid for money, indifferent to the fact that nothing but the high interest rate prevents the shipments of the yellow metal. In other words, money that would have been exported if the interest rates continued low, has been loaned here for a time to get the benefit of the prevailing high rates. When money becomes easier, as it necessarily soon will, gold will again be exported.

The causes for the present stringency are not far to seek. Since January 1st the volume of currency at our money centers has been reduced not only by the net excess of gold exported, say $29,000,000, but also by the amount of gold locked up with the expectation that it will sell at a premium. The amount withdrawn from circulation on this account is unknown, but there is every reason to suppose that it is considerable. Then again the movement of currency to the West commenced this year some three weeks earlier than is usual, owing to the easiness of the money market. Following these movements came a break on the stock market, an unusual volume of transactions and a consequent need of large amounts of money. Money rates went up and shippers of gold sold bills and loaned the money here. It should not be forgotten, however, that settlement of our foreign adverse balance is only postponed; we owe the money and must pay it sooner or later.

Meanwhile the free gold in the Treasury is increasing owing to the fact that a number of Western banks have found it convenient and profitable as well to exchange gold with the Treasury for small notes. As yet we understand that the gold so exchanged has not been actually sent to the Treasury, being left on deposit in the banks loaning it, but it nevertheless counts as part of the Treasury stock. The small amount of gold, say $5,000,000, accumulated in this manner, will not, however, last long when the export movement recommences, as it must unless something is done to restore confidence in the permanency and quality of our currency.

The Austrian loan of 60,000,000 florins has all been taken by the Rothschild syndicate, which is bound to supply the government with £3,000,000 in gold. Unless affairs change this gold will be taken from the United States.

Russia, too, is again in the market for gold, an Imperial Ukase recently issued authorizing an internal loan of 100,000,000 credit roubles, or about $80,000,000, at 4½%, to be placed by the sale of bonds by the Imperial Bank. The bank has given notice that it will undertake the purchase and sale of foreign drafts and issue bills of exchange. In this manner it collects a large amount of gold abroad.

The composition of the Senate Finance Committee is not reassuring to those who wish for an unconditional repeal of the Sherman Act. The committee consists of Voorhees, chairman; McPherson, Vance, Harris, Vest and Jones, Democrats, and Morrill, Sherman, Jones, Allison and Aldrich, Republicans. Among the Democrats, McPherson is the only anti-free coinage man, and the committee is a tie, excluding Senator Vest, whose opinions are by no means certain.

Sir William Houldsworth, British delegate to the Brussels International Monetary Conference, at a session of the House of Commons, March 16th, criticised the action of the British delegates at the Conference and asked what would be the attitude of the government should proceedings at Brussels be resumed. To this Sir William Harcourt, Chancellor of the Exchequer, replied that the delegates would be instructed to oppose every bi-metallistic scheme proposed at the Conference.

The exports of silver from London to the East during the past two months of 1893 and 1892 were as follows: To India, £1,179.680 in 1893, against £1,230,-112 in 1892; to China, nothing in 1893, against £14,200 in 1892; to the Straits, £348,500 in 1893, against £261-691 in 1892.

The influence of the new Austrian Currency Law upon the movement of gold is made apparent by the following figures taken from the London "Economist":

The amount of raw gold imported by Austria-Hungary during 1892 was 21,803 kilos., against 511 kilos. in 1891; of broken gold, 730 kilos, against 533 kilos. in 1891; of gold coin, 29,290 kilos., against 23,595 kilos. in 1891. The total amount of gold imported during 1892 was 51,816 kilos., or 26 797 kilos. more than in 1891; the exports were 11,384 kilos., or 5,388 kilos. more than in 1891. The Monarchy's stock of gold has, therefore, increased 40,432 kilos., beside what may have been produced in the mines of the country.

Domestic and Foreign Coin.

The following are the latest market quotations for the leading foreign coins:

	Bid.	Asked.
Mexican dollars	$.65¼	$ 66
Peruvian soles and Chilian pesos	.59¼	.60
Victoria sovereigns	4.86	4.88
Twenty francs	3.86	3.89
Twenty marks	4 74	4.78
Spanish 25 pesetas	4.80	4.85

Copper.—The demand having fallen off the market is dull, and if anything, quotations are easier. Lake being offered in larger quantities at 11¾ and Casting at 10⅞@11c. From Montana it is reported that at the Anaconda the hoisting of ore has been resumed, the stocks at the smelters having been much depleted. In Europe there exists a good demand for fine copper, which seems to be a little scarce, causing comparatively high prices to be paid. The statistical position improves month by month, and during the first half of this the visible supply was diminished by 1,600 tons. G. M. B.'s closed at £45 5s. for spot, and £45 15s. for three months prompt, while refined and manufactured we quote as follows: English Tough, £48@£48 10s.; Best Selected, £49 5s.@£49 15s.; Strong Sheets, £56@£57; India Sheets, £51 10s.@ £52; Yellow Metal, £4 7s. 8d.

The following figures give the production, in tons of 2,240 lbs., of copper in the United States and also by the chief foreign mines, and the exports of fine copper from the United States for the month of February and for the two months since the beginning of the year.

	Feb. Fine Tons.	Jan. 1, '93. Tons.
Reporting mines in United States	8,213	17,400
Pyrites and outside sources, U. S.	1,042	2,031
Reporting foreign mines	6,762	12,498
Total, long tons	t6,017	31,929
Exports from U. S. (fine copper)	1,815	4,986

The exports of copper from the port of New York during the past week were as follows:

To Liverpool—	Copper Matte.	Lbs.	
S. S. Bovic	4,332 bags	472,899	$20,000
" Servia	4,050 bags	622,975	26,000
To Liverpool—	Copper.	Lbs.	
S. S. Bovic	370 pigs	1t6,570	$35,000
" Servia	40 casks	50,000	$5,700
To Hamburg—	Copper.	Lbs.	
S. S. Tourmina	63 bbls.	78,750	$10,200
To Rotterdam—	Copper.	Lbs.	
S. S. Obdam	50 casks	44,800	$5,100
" "	2,850 pigs	837.208	83,000
" "	652 bars	112,134	13,456

Tin is very firm, with a good volume of business doing at gradually hardening prices. Whatever is brought into this country prior to July 1st will have to be bought in London or Holland, as the time left is too short to permit of further purchases in the East, and this circumstance must affect the European markets. The late scarcity of spot metal has been relieved by the arrival of several steamers, although the bulk of what has come in has been shipped to the interior. Spot closes 21·25 and April-May 21⅜. Abroad the market has advanced from day to day, and closes at £95 5s. for spot, and nominal for three months prompt.

The shipments of tin from England to the United States during the first two months of 1893 show an enormous increase over those for the same period of 1892, 1891 and 1890. They are as follows: 1893, 1,615 tons; 1892, 1,220 tons; 1891, 332 tons, and 1890, 675 tons.

Lead has shown much more firmness in consequence of supplies being rather meagerly offered; here there are no sellers below 4c. In London prices are slightly lower, Spanish lead being quoted at £9 15s., and English at £9 17s. 6d.

Chicago Lead Market.—The Post, Boynton, Strong Company telegraph us as follows: "Market has been stronger under more inquiry with sales of 300 tons latterly at 3·75c."

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "Lead is slowly advancing, last sales being at 3·75c. Consumers appear to believe the metal is cheap enough and are quite willing to lay in supplies at the advance."

Spelter.—The market remains unaltered at 4·27½ @·30, New York. Manufacturers are well covered for the next few months. The foreign market for good ordinaries to be quoted at £17 10s, and at £17 15s. for specials.

Antimony remains dull, with Cookson's obtainable at 10¾@11c., L. X. at 10¾@½c, and Hallett's at 10@10¼c.

Quicksilver.—The market abroad has undergone an advance in prices, which has been reflected here. Quotations: London, £6 10s.; New York, $38.50@ $39. There is a fair average demand for the metal.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 17, 1893.

Pig Iron Production During Weeks Ending March 11th, 1892, and March 11th, 1893, and During Both Years to These Dates.

Fuel used.	Week ending Mar. 11, 1892.		Week ending Mar. 11, 1893.		From Jan., '92	From Jan., '93.
Anthracite.	94	38 970	73	34,310	389 700	329,820
Coke.	164	t38,990	146	134,595	1,389,900	1,321 990
Charcoal	55	11,820	36	8,623	118,200	88,446
Totals	313	189,780	255	177,528	1,897,800	1,740,236

Prices: Southern, ex-steamer No. 1 F., $15.26; No. 2 F., $14.26; No. 3 F., $13.76; Gray Forge, $13.01, Northern, tide water, No. 1 X, $15; No. 2 X, $14; No. 2 plain, $13.50; Gray Forge, $13. Southern irons are quoted, nominally, 26c. higher than Northern.

Scotch pig: Coltness, $21.50 to $22; Eglinton, $19 50 to $20.

Spiegeleisen and Ferromanganese.—Quotations are: Ferro, $56.25@$56.75; Spiegel, $25.50@$26.

Steel Rails $29 at tidewater.

Rail Fastenings.—Fish and angle plates, 1·55@ 1·65c. at mill; spikes, 1·9@2c.; bolts and square nuts. 2·40@2·70c.; hexagonal nuts, 2·70@2·80c. delivered.

Merchant Steel.—Quotations this week are: Mushet's special, 48c.; English tool steel, 15c. net; American tool steel, 6½@7½c.; special grades, 13@ 18c.; crucible machinery steel, 4·75c.; crucible spring, 3·75c.; open hearth machinery, 2·25c; open hearth spring, 2·30c.; tire steel, 2·25c.; toe calks, 2·25@2·50c.; first quality sheet, 10c.; second quality sheet, 8c.

Structural Iron and Steel.—We quote: Beams, 2·3@2 55c., except for 20-in. beams, which are 2·75c.; angles, 1·95@2·15c.; sheared plates, 1·90@2·10c.; tees, 2·30@2·60c.; channels, 2 35@2 50c.; universal plates, 2@2·10c.; bridge plates, 2@2·10c., steel hoops, 1·90@ 8c. All on dock.

Buffalo. March 16.

(Special Report by Rogers, Brown & Co.)

Prices continue low, but are firmer than for many weeks. There is quite a little activity at present, although mostly for small lots from a carload to 100 tons. Considerable interest in the market is being manifested by consumers, it now being generally conceded that a very great slump in prices is improbable in the near future. We quote for cash f. o. h. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, $15.50; No. 2 X foundry strong coke iron, Lake Superior ore, $13.75; Ohio strong softener, No. 1, $14.50; No. 2, $14; Jackson County silvery, No. 1, $17@$17.30; No. 2, $16.30@$16.80; Lake Superior charcoal, $17.25; Tennessee charcoal, $18; Southern soft, No. 1, $14; Alabama car wheel, $19; Hanging Rock charcoal, $20.50.

Chicago. March 16.

(From our Special Correspondent.)

The imminent danger to the business interests of Chicago by the threatened switchmen's strike is happily averted. The determined attitude and prompt refusal of the managers of the various railroads centering here to accede to the demands of the union, together with the wise council and coolness of the leaders, showing that public opinion would surely be against a strike at this juncture, have prevailed. The railroads, however, appear to have been, and are even now, well prepared for any émeute on the part of the discontented ones, one of the roads, with a view of finding out how the men stood, demanded an immediate answer from the leaders as to what they were going to do. The reply was of a pacific and satisfactory nature.

In several departments of the various branches of the iron trade business during the past week has been quieter than earlier in the month, and more observable in crude iron, both Northern and Southern. With regard to the latter most of the larger

consumers appear to be well supplied, but a notable feature is that buyers want their iron at once, and in many instances are exceeding the contract rate of delivery—a very encouraging sign. Limited iron is quiet for bars and plates, but inquiry is active for structurals and slats of the lighter gauges. Old iron rails are in better demand, but scrap is still dormant.

Pig Iron.—The market on local coke iron continues strong, but transactions on the whole have been fewer and for smaller quantities than any week since the end of January. Inquiry, however, continues good, and there is still quite a large tonnage in sight. Orders generally have been limited to 50 or 100 tons, and while several contracts for 500 to 1,000 tons have been placed, they were exceptional. All foundries, large and small, are well employed and using quantities of metal, many exceeding their regular contracts. Some grades of coke iron are being very successfully used instead of charcoal in the manufacture of car wheels. Southern coke iron has also fallen off and most of the buyers appear to have supplied their more immediate wants.

The demand is light and the market very much in buyer's favor. Prices are weak and somewhat irregular as the result of pressure to sell. Lake Superior charcoal is in very light demand, and while orders are small, prices hold steady.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $16.50@$17.25; Lake Superior coke, No. 1, $13.50@$14.00; No. 2, $13.25@$13.50. No. 3, $12.75@$13; Lake Superior Bessemer, $14.25; Lake Superior Scotch, $14.25@$14.75; American Scotch, $16.25@$16.75; Southern coke, foundry, No. 1, $14.25; No. 2, $13.35; No. 3, $13.00; Southern coke soft, No. 1, $13 35; No. 2, $13.00; Ohio silveries, No. 1, $16.50; No. 2, $16.00; Ohio strong softeners, No. 1, $16.75; No. 2, $16.25; Tennessee charcoal, No. 1, $17; No. 2, $16.50; Southern standard car wheel, $19.50@$20.

Steel Billets and Rods.—Small orders from stock for 4 x 4 billets are fair at $25. Nothing doing in rods, which are nominal at $32.50.

Structural Iron and Steel.—There is quite a good inquiry for architectural shapes and bridge material, and several large contracts are still pending. Some small jobs were let, aggregating 900 or 1,000 tons. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, $1.90@$2; tees, $2.15@$2.25; universal plates, $1.95@$2; sheared plates, $1.95@$2; beams and channels, $1.95@$2.25.

Plates.—There is a fair volume of business, all told, but it is at lower prices, and the trend is evidently downward. Tubes are badly demoralized. Steel sheets, 10 to 14, $2.30@$2.40; iron sheets, 10 to 14, $2.20@$2.30; tank steel, $1.90@$2; shell iron or steel, $2 50@$2.75; firebox steel $4.25@$5.25; flange steel, $2.75@$3; boiler rivets, $4@$4.15; boiler tubes, all sizes, 60%.

Merchant Steel.—Indications are already beginning to multiply pointing to an early buying movement, and some implement makers have already notified manufacturers of their desire to place contracts in April. Shipments continue large. Quotations are: Tool steel, $6.50@$6.75 and upward; tire steel, $2@$2.10; toe calk, $2.30@$2 40. Bessemer machinery, $2.10@$2 20. Bessemer bars, $1.70@$1.75; open hearth machinery, $2.30@$2.40; open hearth carriage spring, $2.10@$2.20; crucible spring, $3.75@$4.

Galvanized Sheet Iron.—Manufacturing consumers, cornicemen principally, are free buyers from warehouse and mill. Discounts are unchanged at 70 and 10% off on Juniata and 70 and 15% off on charcoal, and jobbing quantities at 70 and 5% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—The sheet iron season may be said to have fairly opened. Inquiry is heavy, several mills have refused large blocks, and some are asking 50c. to $1 a ton more than they did in February. A large tonnage could be placed at once at old figures. Quotations on iron sheets are 2·85c. for No 27, common; steel sheets are 2·35c. Jobbers quote 3@3·10c. for iron and 3·10@3·15c. for steel, same gauge.

Bar Iron.—Probability of trouble with the rollers in July has somewhat stimulated the inquiry during the week, but transactions are slow, many consumers holding back, expecting lower prices. Prices are certainly a little easier at 1·57½@1·60e., Chicago Warehouse business is only fair at 1·70@1·80c. rates for iron or steel in less than carloads.

Steel Rails.—So far Western railroads have been chary with orders for good round lots, but, as their known requirements are large, contracts cannot be withheld much longer. Inquiry is fair and small lots of several thousand tons are frequent. Quotations are steady at $30@$32 at mill, according to quantity and delivery. Track supplies are in moderate demand at 1·60@1·65c. for iron and steel splice bars; track bolts, square nuts, 2·55c.; hexagon, 2·65c.; spikes, 2·05@2·10c. according to style.

Nails.—Wire nails from mill are inactive, but $1.65 base is bottom on all new business offering. Jobbers quote $1.70 from store. Steel cut nails are in better demand than they have been since the new card was adopted, and $1.40, Chicago, is steady. Jobbing quotation is $1 50 base for small lots.

Scrap.—Consumers continue to buy lightly, and dealers are declining to quote on offers of material from railroads. Quotations are largely nominal: Railroad, $15; No. 1 forge, $14; No. 1 mill, $9.50; fish plates, $15.50; axles, $18.50; horseshoes, $15; pipes and flues, $7; cast borings, $5.50; wrought turnings $8; axle turnings, $9.50; machinery castings, $10; stove plates, $6.50; mixed steel, $10.; coil steel, $15; leaf steel, $15.50; tires, $14.50.

Old Material.—Negotiations are in progress for several 1,000 ton lots of iron rail bids, and asking prices are $18@$19. Steel rails are selling at $11@$14.75, according to length and condition. Car wheels are in better demand at $14.50@$14.75, and some 500 to 600 tons sold last week at those figures.

Philadelphia. March 16.

(From our Special Correspondent.)

Pig Iron.—More iron has been contracted for this week for spring delivery than would be supposed from the dolorous expressions of brokers and agents of makers. This is particularly true of foundry irons. Special brands are scarce; at least makers feel so sure of selling all they will have that they have practically withdrawn them from the market. Standard brands are not treated quite so independently, but even with them there is not the same pushing to sell. The demand for forge iron is light. Millmen are waiting for orders. Standard, $13. Southern, $12.50. No. 1 Foundry, $15. No. 2, $14.50. Slight variations occur from these figures for quality. Standard Bessemer, $16. No business.

Muck Bars.—The only hope of makers is higher price for steel, of which there is a very slim hope. Price $23.50.

Steel Billets.—Quotations have been made on large orders for summer delivery under $25, for early delivery $25. The upward tendeney has frightened no one into ordering heavily, but more interest is felt in the market; manufacturers assert that the only thing wanted to start up heavy buying is a little more confidence.

Merchant Iron.—Business is done in a moderate way at $1.50@$1.70. It is probable three or four mills in the Schuylkill Valley will come to single turn next week. Some mills have suffered from high water.

Nails.—An increasing demand from retailers is reported at old prices.

Skelp.—Prices, $1.50@$1.55. Orders small. A good deal of business is in sight, but there are no inducements to place it.

Sheet Iron.—The only bright spot is the satisfactory volume of business at all the mills. The prices realized are very low, and no effort is made to get better figures. Best refined, 2¾@3¼. The orders for galvanized are large.

Pipe.—Unusual discounts are being offered to induce some business of a desirable nature.

Plate and Tank.—Small buyers paid higher prices on small orders this week for early delivery than for two months past. The past week brought a large amount of business in small lots. If this run continues May deliveries will soon be fully a tenth higher than February. Yet there is the same anxiety and shading on large orders. Steel flange, 2·25, and iron or steel tank, 1·75.

Structural Material.—Excellent prospects loom up this week for large orders within 60 days, but the struggle for them shows prices are weak. Angles and universal plates, 1·75@1·80; beams, ties and channels, 1·90@2.

Steel Rails quoted dull at mill at $29.

Old Rails.—Offers to-day at $17.50, which buyers say will yet be accepted.

Scrap.—An active demand for No. 1 R. R. at $15.50.

Pittsburg. March. 16.

(From our Special Correspondent.)

Raw Iron and Steel.—The consumption of iron and steel continue very large. The probables advance indicated in our last report has been realized. The demand for Bessemer pig and steel billets continues active, the consumption large; at the same time it requires more money to purchase them than it did one week ago; still, at the same time, prices are fully $1 to $1.50 per ton below what they ought to be. The difference in the price of Grey Forge and Bessemer is only $1.25@$1.50 per ton; this ought to be at least $2.50.

The Valley furnaces are running full, principally in Bessemer, with sales at the furnace, $13@$13.25, being equal to $13.60@$13.80 Pittsburg delivery. There are different opinions in regard to the recent upward movement in leading descriptions which seems to have started at several points. The immediate foundation for the feeling is probably due to increased cost on foreign ores, and a sympathetic movement in leading markets. Makers show more disposition to ask still higher figures than to concede anything in buyer's favor. The fact that we are consuming upwards of 9,000,000 tons of pig iron a year proves that we are doing a business averaging well up to the largest on record, and yet prices are at the lowest. If this is true, and there is no denying it, the natural inquiry is, why is it so? It is not easy to give a completely satisfactory answer, and yet there is no donbt that it arises from the general substitution of steel for iron.

During the past five years nearly every mill in the country has increased its capacity in machinery and general appliances and to this must be added the largely increased capacity for turning out steel as compared with iron. A mill with a capacity for 500 tons of iron can easily turn out 700 to 750 tons of steel; hence it will be seen that in spite of the enormously increased consumption there is still greater relative increase in production, so that even with the demand equal to the largest in the history of the trade prices are low, weak, unremunerative, and in every sense of the word unsatisfactory.

A leading Eastern dealer has this to say: "There is considerable competition for orders, and while some producers are making terms to suit buyers, others refuse to meet the prices which are named by their competitors."

Pig Iron.—The leading producers continue firm in their prices, and the sales of well known and standard brands have kept up well, so that the furnaces producing this grade of iron are supplied with orders sufficient to absorb their current output for some weeks. There is considerable competition in other grades, the advantage being on the side of the buyer, and prices are being cut pretty fine. Reports from the West show a weakening of the Southern furnaces supplying these markets." As regards the statistical situation, production has shown an increase during the month, although stocks of pig iron have slightly declined. Weekly capacity, 171,211 tons; during February sold and unsold stocks at the furnaces decreased 7,697 tons. The very latest: Bessemer pig and steel billets show a further advance, with spot deliveries scarce. Sales were large, viz.:

Coke Smelted Lake and Native Ore.

Tons.	Cash.
5,000 B., Mar., April..	$13.45
4,000 B., Mar., April..	13.65
3,000 B, Mar., April..	13.70
3,000 B., April, May..	13.50
3,000 B. Mar., April..	13.60
1,500 B., April, May..	13.50
1,000 B., Mar., April..	13.75
1,000 G. F., Mar.....	12 25
1,000 G. F., April....	12 25
1,000 G. F., April....	12.25
1,000 B. at Valley Furnace.....	13.00
1,000 M.....	12.35
500 B, prompt..	13 75
300 O. M.....	12 35
300 No. 1 F	14 00
300 No. 2 F.....	13.25
250 No. 1 S.....	16.00
200 No. 2 S.....	15.00

Blooms, Billets and Slabs.

4,500 B., Apr., May, June, at mill ..	22.15
3,000 B. and S., March, Apr.....	22.25
2,500 R. B, Mar.....	22.75
2,000 B. and S,, Apr., May.....	23.00
1,500 B., Mar., Apr., May.....	22.50
500 B., Mar	23.00

Charcoal.

200 C. B.....	26.00
150 C. B	26.50
100 No. 2 F....	18.80

Charcoal.

Tons.	Cash.
50 No. 3 F.....	$18.50
50 No. 1 F.....	20.00
25 C. B., extra.....	30 00
1,000 N.....	24.25
500 N., Mar., Apr....	24.50
500 N.....	24.25
450 N.....	24.30

Iron Skelp.

850 S.....	1.75	4 m.
700 N. G	1.52½	4 m.
850 W. G.....	1 50	4 m.

Skelp Steel.

650 W. G.....	1.50	4 m.

Ferro-Manganese.

200 80% dvd.....	59.20
100 80% dom.....	59.50

Sheet Bars.

500 S. B., at mill.....	28.50

Steel Wire Rods.

850 5 gauge Amer. at mill.....	30.00

Spelter.

75 Spelter.....	4 15

Blooms, Billets and Bar Ends.

500 Bar and Billet Ends.....	15 25
300 Bar and Billet Ends	15.25

Old Iron and Steel Rails.

600 O. I. Rails, Youngstown, Del.	20.00
500 O. I. Rails, Youngstown, Del.	20.25
500 O. S. Rails.....	14.75

Scrap Material.—1,000 Tons O. H. Milling stock, net, $15.25; 500 Tons Bessemer Steel Scrap, gross, $15.75; 300 Tons Cast Scrap, gross, $11.75.

ABBREVIATIONS: B., Bessemer; G. F., Grey Forge; F., Foundry; S., Silvery; O. M., Open Mill; C. B., Cold Blast; N. G., Narrow Grooved; W. G., Wide Grooved; M. I., Mill Iron; N., Neutral; S. S. Short Steel.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 17.

Statement of shipments of anthracite coal (approximated), for week ending March 11th, 1893, compared with the corresponding period last year:

Regions.	March 11, 1893. Tons.	March 12, 1892. Tons.	Difference.
Wyoming Region.....	468,375	410,280	Inc. 58,095
Lehigh Region.....	134,862	116.371	Inc. 18,491
Schuylkill region.....	260,470	248,827	Inc. 11,643
Total.....	863,707	775,478	Inc. 88,229
Total for year to date....	7,531,571	7,355,090	Inc. 176,481

Statement of shipments of anthracite coal for month of February, 1893, compared with the corresponding period last year. Compiled from the returns furnished by the mine operators:

	February, 1893.	February, 1892.	Difference.
Wyoming region....	1,816,567.02	1.623,615.14	Inc. 192,551.08
Lehigh region.....	455,487.08	429,187.07	Dec. 33.699.19
Schuylkill region...	856,752.11	1,059,218.15	Dec. 202,466.01
Total.....	3,128,807.04	3,172,021.16	Dec. 43,214.12
	For year.	For year.	Difference.
Wyoming region....	3,691,661.07	3,143,117.13	Inc. 548,543.14
Lehigh region.....	863,282.02	885,579.19	Dec. 22,297.17
Schuylkill region...	1,643,443.04	1,994,810.19	Dec. 351,367.15
Total.....	6,198,386.13	6,023,508.11	Inc. 174,878.02

The stock of coal on hand at tidewater shipping points February 28th, 1893, was 601,854 tons; on January 31st, 1893, 532,375 tons; increase, 69,479 tons.

PRODUCTION OF BITUMINOUS COAL for week ending March 11th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1893. Week.	1893. Year.	1892. Year.
Phila. & Erie R. R.....	2.616	28,846	18,117
Cumberland, Md.....	73,871	653,391	613,875
Barclay, Pa.....	1,263	15,713	42,934
Broad Top, Pa.....	18,263	158,673	113,699
Clearfield, Pa.....	68,516	784,942	711,310
Allegheny, Pa.....	33,645	222,671	227,322
Beach Creek, Pa.....	27,642	415,437	455,784
Pocahontas Flat Top.....	58,412	490,822	500,622
Kanawha, W. Va..... ...	59,007	621,724	480,294
Total.....	343,235	3,392,219	3,163,957

WESTERN SHIPMENTS.

	1893. Week.	1893. Year.	1892. Year.
Pittsburg, Pa.	24,363	259,269	259,475
Westmoreland, Pa.	43,483	391,369	352,690
Monongahela, Pa	16,957	147,864	88,119
Totals	84,803	798,502	700,284
Grand totals	428,038	4,190,721	3,867,241

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending March 11th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 121,997 tons; year 1,107,309 tons; to corresponding date in 1892, 1,181,458 tons.

Anthracite.

Stricken with remorse, actuated by a desire for public office, or, what is more probable, succumbing to the inevitable, the sales agents have reduced the prices of standard sizes of anthracite.

At a meeting held March 14th the following schedule was announced, to go into effect at once: Broken and egg, $3.90; stove and chestnut, $4.15; The old prices were: Broken, $4; egg, $4.40; stove, $4.75; chestnut, $4.65, for free-burning white ash. This is a reduction of 10c. on broken, 50c. on egg, 60c. on stove, and 50c. on chestnut.

This is the first reduction in the price of standard sizes which the sales agents have made since the Reading combine ordered the circular prices of last April. In the meantime the Jersey Central has been forced to withdraw from the combine, the Lehigh Valley has reduced its dividend from 7% to 5%, and the chief offender, the Philadelphia & Reading, is undergoing painful experiences. It has seen its stock decline in value until people began to wonder where it would stop, and stood from under. It has seen public sentiment arrayed against one of the most unjust and oppressive combinations of recent years, which, in truth, have been full of such things. It has seen the invasion of what it regarded as its own territory by soft coal and crushed coke, and it is to-day badly hampered by the attempt to control the New England anthracite trade.

The combination which has ruled the anthracite coal trade with a rod of iron during the last 12 months is still able to say to the sales agents "Thumbs up," or "Thumbs down, Simon," and Simon's thumb, like that of a Roman emperor, signals life or death.

Let no one imagine that the powers that be are nor able to fix the price of coal now and that outsiders exert a more powerful influence than they did six months or one month ago. The reduction in price was opposed by several of the agents, who said that it was good policy to hold to circular rates as long as the public needed coal and was forced to buy it, but the majority favored a reduction and it was ordered. The combination is able to-day to put prices where they were before, and what is more, to maintain them for a month longer. The combination is not broken, in reality it is scarcely shaken, and it bears to the coal-consuming public the same relations it bore last fall and at the beginning of winter. That is to say, it is just as grasping, as unjust and as illegal as it was then.

The action of the sales agents is as commendable as any act of tardy justice forced from a despot by circumstances entirely beyond the sphere of his desires. It is the Magna Charta of the consumers, revocable, however, at the will and pleasure of the coal barons, not of King Public.

The receivers of the Reading have published a statement of the approximate tonnage and value of the coal on hand. These items are as follows:

Stock.	Tons.
Port Richmond	125,706
New York and vicinity	341,886
Schuylkill Haven and line points	35,740
Baltimore and vicinity	4,506
Buffalo and vicinity	296,630
Chicago and Western points	257,920
Boston and Eastern depots	45,448
	1,107,836

This is valued at $4,985,262, or $4.50 per ton.

The coal tonnage passing over the Reading system for the week ending March 11th, was 548,138, and for the year 5,918,279, as against 432,658 for the corresponding period in March, 1892, and 6,089,677 for the corresponding period in the year 1892.

Arnot's appeal in the matter of the Philadelphia & Reading Railroad Company, mentioned in our issue of February 4th, 1893, page 115, dealing with the legality of the lease of the Central Railroad of New Jersey and the Lehigh Valley to the Philadelphia & Reading, has been postponed to the June term of the Supreme Court of Pennsylvania. It was fixed for argument this week, but was postponed so that the court might pass upon this as well as upon the appeal from the decision of the Dauphin County Court in the case of the Commonwealth of Pennsylvania vs. the Philadelphia & Reading Railroad Company. The two appeals involve practically the same questions, and they will be settled at the June term.

Bituminous.

The reduction in the price of anthracite will not affect the soft coal trade except to stimulate it to greater activity. With the disappearance of cold weather and the improvement in the car supply consequent upon a relief of several blockades the transportation of soft coal may be expected to resume its usual course at this time of the year.

An interesting feature of the contest between anthracite and bituminous coal in and around Boston is illustrated by the statistics of coal receipts at that port during the last three years.

In 1891 the total receipts of coal at the port of Boston were 3,065,989 tons, of which 2,088,717 tons, or 68·2% was anthracite, and 977,272 tons, or 31·8% was bituminous. In 1892 the total receipts were 2,941,446 tons, of which 2,065,536 tons, or 66·4% was anthracite and 875,910 tons, or 33·6% was bituminous. The decrease during 1892 was 124,543 tons, made up of 23,181 tons of anthracite and 101,362 tons of bituminous. In 1890 the receipts of coal at the port of Boston were 2,812,611 tons, of which 1,740,574 tons, or 62·5%, was anthracite and 1,072,037 tons, or 37·5%, was bituminous. The combination in the anthracite trade does not seem to have affected the soft coal tonnage at Boston beyond an increase of 1·8%.

Our Nova Scotia friends are worrying over the retail price of Cape Breton coal at Halifax. It seems that the retail price of a chaldron of 3,000 lbs. is $2.48 f. o. b. mines, and $6 in Halifax, and they want to know, you know, why they have to pay $3.52 between Sydney and Halifax. The statement is made that the f. o. b. mine price of a gross ton of coal in Cape Breton is $1.85, which would make the chaldron cost $2.48. Well, brethren, we will answer your question if you will answer one for us, and that is, why a ton of Pocahontas coal sells for $2.40 and has often sold for $2, at Norfolk, 400 miles from the mines, and for $3 50 at Roanoke, 150 miles from the mine, both places being on the same line of rail and the Norfolk coal having to pass through Roanoke on its way from the mines?

When you begin to inquire as to the origin of things, as Bentham used to say, you begin to ask questions that cannot be answered. The same remark applies to the transportation of coal.

We understand that the Dominion Coal Company thinks that coal is too cheap, so when the Halifax people have to pay $7 per chaldron they will begin to appreciate the latest American invention—Government by Monopoly.

When the Dominion coal company shall have perfected its plans, and the combination among the American soft coal producers and transporters shall have made itself felt and the anthracite combine shall have renewed its youth, then it will be time to return to a state of nature and keep warm by excess of wrath.

Prices in New York Harbor are from $3.10 to $3.15, and at lower tidewater ports $2.50 to $2.60.

Charter rates are: New York to Rhode Island, 65 to 75 cents; to Boston, 75 to 90 cents. Philadelphia to Sound ports, $1.10 to $1.15; to Boston, $1.15; to Portsmouth, $1.25. Baltimore to Sound ports, $1.10 to $1.15; to Boston, $1.20 to $1.25.

Boston. March 16.

(From our Special Correspondent.)

The reduction of 60c. in stove coal, 50c. on egg and chestnut and 10c. on free broken was somewhat of a surprise here, as it was thought a reduction would not be made until later in the month. After such a reduction trade is naturally quiet.

Prices quoted here are, f. o. b. New York, stove and chestnut, $4.15; broken and egg, $3.90.

The large contracts closed this week were: Lawrence Manufacturing Company, 20,000 tons; Amoskeag Mills, of Manchester, 30,000 tons; Naumkeag Mills, of Salem, 10 000 tons. There is but a fair demand for spot coal. George's Creek on cars is worth $4@$4.05; Clearfield, $3 85.

Freight rates continue firm. From New York, 75@80c.; from Philadelphia, $1.10@$1.15; from Baltimore, $1.25; from Norfolk and Newport News, $1 10@$1.15.

Retail trade is fair and prices remain unchanged.

Buffalo. March 16.

(From our Special Correspondent.)

The anthracite coal trade continues in a satisfactory condition. Good trade and remunerative prices rule. The weather is all that the coal producers can desire, and at time of writing the thermometer is about zero. It is many years since our section of the United States has experienced such steady cold temperature for so long a period; over three months have passed since the wintry spell commenced.

The bituminous trade is also in excellent shape. Dealers make no complaints with regard to supply, demand or quotations. Our factories are all running full time and every week adds to their number.

The coke business is good and the increase of manufactures necessarily causes an increased consumption. Prices unchanged.

The coal docks to be erected by the Northwestern Fuel Company on Allouez Bay, head of Lake Superior, will be the largest in the world and supplied with every modern device. They will have a water frontage or length of 3,160 ft., and will be 958 ft. in width. It is expected that when this dock is completed the four docks now operated by the company at Duluth will be abandoned.

The ice went out of Buffalo River last Sunday without doing any damage. Our fire tugs did efficient work in breaking up the ice at points where it had lodged.

A Bay City firm has laid the keel of the largest steel vessel on the lakes, to be called the "Centurion." She will carry 4,000 tons of coal on 16 ft. draft, and will cost $280,000. Her length over all will be 378½ ft.; keel, 360 ft.; beam, 45 ft.; and hold, 26 ft.

The Reading receivership and matters connected with Mr. McLeod's affairs continue to absorb a great deal of attention among our public men and merchants.

The prospect of a late opening of navigation and a consequent short season, taken in connection with the immense amount of coal, grain, lumber, etc., to be transported, has caused vessel owners to be very stiff in their ideas of the price to be paid for transporting ore from Lakes Superior and Michigan shipping ports to Buffalo, Erie, Cleveland, Ashtabula and other Lake Erie ports. The probable rate will be from 10 to 15 cents higher than the figures of 1892.

Our citizens are agitating for cheap gas. "If Cleveland companies can supply gas at 80 cents per 1,000 ft.," they say, "why cannot the Buffalo concern do the same?"

The severe cold has frozen Buffalo River over again.

Two million feet of gas daily is the capacity of another well struck a few days since in Canada, owned by Buffalo men.

Chicago. March 16.

(From our Special Correspondent.)

The wholesale anthracite trade for the past week has been very dull, the mild weather, together with muddy roads in the country, has produced the usual absence of orders from that source, and the prospects of a material decline in the price to be made before the opening of navigation is not very encouraging for any shipper or dealer to buy, except for his immediate requirements. Some little inducements are held out and offered by several of the shippers having coal in or near Chicago on tracks which it is desirable to move. These amounts are fortunately small and the cuts made have had no appreciable effect on the market. Retail trade has fallen off very materially, but still with the daily average output of 3,000 tons of anthracite for the next month or six weeks, or probably to the opening of navigation, all stocks will be practically absorbed by that time. Several of the largest shippers are piecing out their stocks and trading with each other their surplus for sizes of which they are short. The present season, now about past, should have been a prosperous one for all dealers in anthracite coal, and it is expected that the annual crop of spring failures will be very light this year. With the softening of certain of the too rigid restrictions put upon the trade last year, a continuation of the major part of the combination's policy for the past twelve months seems to us the wisest judgment which could be shown. The public are beginning to realize that the prices exacted are not exorbitant in comparison with the cost of the article at this distance from the mines, and another year will probably show a greater amount of profit for all concerned if the various interests continue to hold their agents in the West firmly and emphatically to the line pursued during the past season in regard to the maintainance of prices and the non-interference with each other's trade.

Bituminous coal is in heavy supply, largely due to shipments coming forward which should have arrived last month; this, together with the warmer weather, has caused a temporary surplus of coal for which there is little demand. The switchmen having wisely determined not to strike, and the mild weather limiting the demand from all quarters, the market is fast acquiring its normal condition, and stocks and prices are somewhat easier than they have been for several months. The only exception to the foregoing is probably Indiana block coal; the limited supply and the very limited transportation facilities afforded this coal, the C. & E. I. R. R. refusing to allow its cars to go beyond Chicago and group points, tend to keep the price at from $2.60 to $2 75 per ton on track here. This price is now further strengthened by the advance in coal freight rates of 10 cents per ton by the road mentioned, on everything outside of absolute contracts, which will be protected until May 1st. There are large amounts of bituminous coal of all grades within a narrow radius of the city, but as this accumulated from the railroads' inability to handle and deliver the coal at a time during the past month when it was anxiously sought for by the consignees, little has been said about car service or demurrage charges, and the owners are gradually working it off at fair prices. Wilmington and other coal from the northern Illinois coalfield has dropped a notch or two, and Eastern coal is much easier.

Coke is in fair demand, nearly all foundries are busy, and supply of Connellsville, though irregular is ample. Except for manufacturing purposes crushed coke is dull.

Quotations are: $4.65 furnace; $5.05 foundry, crushed; $5.40 Connellsville; West Virginia: $3.90 furnace, $4.10 foundry; New River foundry, $4.75; Walston: $4.65 furnace, $5 foundry.

Circular prices are at the following rates: Lehigh lump, $6.50; large egg, $5.85; small egg, range and chestnut, $6.10. Retail prices per ton are: Large egg, $7.25; small egg, range and chestnut, $7.25.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, $3.40; Hocking Valley, $3 10; Youghiogheny, $3.25; Illinois block, $2.75; Brazil block, $2.60@$2.75.

Pittsburg. March 16.

(From our Special Correspondent.)

Coal.—There is but little change in the mining situation. In speaking of the proposition to arbitrate, the coal men don't want it; they can't pay 3½c., and will keep their mines closed until the 3c. price is agreed to. They also claim the diggers heretofore have never accepted a decision that was not favorable to them. A member of W. H. Brown Sons said: "We are operating the Black Diamond and old Eagle mines, and have all the miners we need."

There is no dissatisfaction or trouble of any kind at our pits. Reports show that within a short time, 1,058 new men have gone to work. Capt. S.

Brown is arranging with the Alabama coal men for 300,000 tons of Alabama coal for Memphis and New Orleans and other Southern markets; he also said that the miners' strike in western Pennsylvania had paralyzed the coal business, and that this was the reason he was trying to get coal elsewhere.

Parkersburg, West Va., March 14th.—It seems that Pittsburg parties have contracted for nearly the entire output of the coal mines in this vicinity. The big tow boat Diamond stopped here this morning and made up an immense tow of coal, as the coal goes to Cincinnati and Louisville. As both sides say they are sure to win all we can do is to wait and report the winner when the battle is over. Operations in the railroad mines are still retarded by the lack of shipping facilities. Many of the mines are being run at only half their capacity. Prices unchanged.

Connellsville Coke.—Trade is still under the disadvantage of inadequate transportation facilities. Several idle Pittsburg and valley furnaces have gone into blast, increasing the demand from 50 to 75 cars per day. The active ovens are being increased to meet the enlarged demand. Production has remained stationary at 120,000 to 125,000 tons per week during the last two months, while the shipments have fluctuated from 4,631 to 7,563 cars. Over 600 cars of eastbound coke were held over in this region last week.

The shipments of coke from the region for the week aggregated 125,932 tons, distributed as follows: To Pittsburg, 1,800 cars; to points east of Pittsburg, 1,072 cars; to points west of Pittsburg, 3,756 cars; total, 6,628 cars. Western shipments increased 275 cars; eastern shipments decreased 297 cars; Pittsburg shipments increased 80 cars, making a net increase of 59 cars. The highest week's shipment this year was February 18th—141,037 tons. Prices show no change.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, March 17.

Heavy Chemicals.—The market generally is somewhat easier in tone than last week, owing to various arrivals during the past few days. Bleaching powder is somewhat lower in price than last week, being quoted at 2·50@3c. The demand for caustic soda has been so good that there are surplus stocks on hand. There is no change to report of the other heavy chemicals. We quote this week: Caustic soda, 60%, 2·95@3·10c.; 70%, 2 70@2 80c.; 74%, 2 72½@2·82½c.; 76%, 2·80@2·90c. Carbonated soda ash, 48%. 1·40@1·60c.; 58%, 1·35@1·40c. Alkali, 48%, 1·35@1·40c.; 58%, 1·30@1·40c., according to package. Sal soda, English, on the spot, 1·05@1.10c.; American, ·90@·95c.; bleaching powder, 3@3·50c.

Acids.—Prices of acid continue as last reported. During the past week a fair business has been done and manufacturers state that the demand continues good. Our quotations this week are as follows: Acid, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, $1.75@$2, according to quality; muriatic, 18°, 90c.@$1.10; 20°, $1@$1.25; 22°, $1.25@$1.50; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 90c.@$1.10; mixed acids, according to mixture, oxalic, $6.15@$6.50. Blue vitriol is quoted all the way from $3.25 to $3.75; glycerine for nitroglycerine, 11½@12½, according to quality and quantity.

Brimstone.—Prices are slightly lower this week, as follows: Best unmixed seconds, on the spot or near by, $21; to arrive, April-May or May-June shipments, $20; best unmixed thirds, 75c.@$1 lower. Some sales are reported at these prices.

Fertilizing Chemicals.—There is very little change to report of this market. The ammoniates continue scarce and prices correspondingly high. Sulphate of ammonia has undergone an advance on the other side which has been reflected on this market. A fair demand and a good inquiry are reported for the various fertilizing chemicals, and several sales were made during the week. Prices continue firm. Quotations are as follows: Dried blood, $3.20@$3.25 per unit; azotine, nominally. $3 20@$3 25; sulphate of ammonia, on the spot, $3.30@$3.40 for bone goods and $3.50@$3 60 for gas liquor. Acidulated fish scrap, no stocks on hand; dried scrap is scarce and is quoted at $31 f. o. b. fish factory. Tankage, high grade, $31@$33; low grade, $29@$31. Bone tankage, $24@$25; bone meal, $24@$25.50.

Phosphate Rock.—There is nothing of interest to report of the phosphate market this week. Quotations are unchanged: $4.75 for 55% rock, free alongside at Charleston, S. C.

The potash salts generally have been in very fair demand. The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, $1.12; Philadelphia, $1.14½; Charleston and Savannah, $1.17 cwt. basis, 48@50% in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%-96%, basis, 90%: New York and Boston, $2.07; Philadelphia, $2.09½; Charleston and Savannah, $2 12; sulphate of potash, 96-99%, basis 90%, is 4% higher.

Muriate of Potash.—The arrivals of muriate this week aggregated 200 tons, all of which were sold prior to arrival. There is only a small stock on hand, and it is held at high prices, $1.87½@$2, according to quantity being asked. A fair business has been done. The prices fixed by the syndicate for 1893 are as follows: New York or Boston, $1.7c; Philadelphia, $1.80½; Southern ports, $1.83.

Kainit.—Some sales were made this week, both spot and to arrive. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, $8.75 for foreign invoice weight and test, and $9 for actual weight; Charleston, Savannah and Wilmington, $9.50 for invoice weight and test, and $9.75 for actual weight. Shipments after September 1st, 25c. higher.

Nitrate of Soda.—Prices are somewhat lower than last week, otherwise no change of importance can be reported of the nitrate market. Quotations are: On the spot, $2:30; summer shipments, $1.75. To arrive, according to position.

Liverpool. March 8.

(Special Correspondence of Jos. P. Braunner.)

Our market for heavy chemicals is rather quieter this week and less business reported. Soda ash is in moderate demand and prices are nominally unchanged, the range being about as follows, viz.: Caustic ash, 48%, £5 to £5 5s. per ton; 57 to 58%, £5 15s. per ton. Carb. ash, 48%, £5 to £5 5s. per ton; 58%, £5 7s. 6d. to £5 15s. Ammonia ash, 58%, £5 to £5 5s., all net cash. For deliveries over all 1893, orders have been booked at concessions on above price. Soda crystals are dull at £3 to £3 2s. 6d. per ton, less 5%.

Caustic Soda.—There are a fair number of inquiries, but at the same time few transactions are reported. Quotations vary considerably according to quantity and export market and may be nominally quoted as follows, viz.: 60%, £8 5s. to £9 per ton; 70%, £9 5s. to £10 per ton; 74%, £10 5s. to £11 per ton; 76%, £11 15s. to £12 5s. per ton, all net cash. For parcels under 10 tons, 5s. per ton extra is charged.

Bleaching powder is strong at £8 10s. to £8 15s. per ton, net cash for hardwood packages. Chlorate of potash is less active again, and there is not much going on, but at the same time the article is very scarce for this month. The nearest values are, March, 9¼d.; April, 9d.; May, 8¾ to 9d.; June, 8¼d.; July-December, 7¾d. to 8d.

Bicarb. soda is steady £6 15s. per ton, less 2½% for 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia has had a very considerable advance, and the article is very scarce, buyers having a difficulty in filling any orders, and nearest values to-day are: £11 12s. 6d. per ton for good gray, 24%, and £11 15s. for 25%, both in double bags, less 2½% f. o. b. Liverpool.

Nitrate of soda is quiet, but at the same time prices are unchanged at £10 5s. to £10 7s. 6d. per ton, less 2½% in double bags, f. o. b. Liverpool.

Carb. ammonia.—Lump, 2¾d. per pound; powdered, 3½d. to 3¼d. per pound, net cash.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, chem. pure .16@.17
Commercial, in bbls. and cbys. .015@.017
Carbonic, liquefied, ℔ lb. .18@.25
Chromic, chem. pure, ℔ lb .1.00
for hatteries .40
Hydrobromic, dilute, U. S. P. .25
Hydrocyanic, U. S. P. .45
Hydrofluoric .20
Alcohol—95%, ℔ gall .$2.30@$2.40
Absolute .$3.80
Ammoniated .$2.80
Alum—Lump, ℔ cwt. .$1.75@$1.80
Ground, ℔ cwt. .$1.85@$1.90
Powdered, ℔ lb. .04½@.05
Lump ℔ ton, Liverpool .£5
Aluminum Chloride—Pure, ℔ lb. .$1.25
Amalgamating solution, ℔ lb. .60
Sulphate, ℔ cwt .$1.90@$2.50
Ammonia—Sul., in bbl. lots, ℔ lb. .02½@.03
Carbonate, ℔ lb., English and German .07½@.07¾
Muriate, white, in bbls., ℔ lb. .08¼
Aqua Ammonia—(in cbys) 18° ℔ lb. .03@.04
20°, ℔ lb. .04@.05
26°, ℔ lb. .05@.05½
Antimony—Oxymur, ℔ lb. .04@.06
Regulus, ℔ lb. .10@.11¼
Argols—Red, powdered, ℔ lb. .15
Arsenic—White, powdered ℔ lb. .03@.03¼
Red ℔ lb. .065@.07
Yellow .08@.09
White at Plymouth, ℔ ton .£12 2 6
Asbestos—Canadian, ℔ ton .$50@$300
Italian, ℔ ton, c. i. f. L'pool .£18@£60
Ashes—Pot, 1st sorts, ℔ lb. .4.75@5
Pearl .06@.06¼
Asphaltum—
Prime Cuban, ℔ lb. .04@.05
Hard Cuban, ℔ ton .$28.00@$30.00
Trinidad, refined, ℔ ton .$30.00@$35.00
Egyptian and Syrian, ℔ lb. .05@.07½
Californian, at mine, ℔ ton $12.00@$26.00
at San Francisco, ℔ ton. $15.00@$29.00
Barium—Carbonate, pure, ℔ lb. .45
Carbonate, commercial, ℔ lb. .05@.10
Chlorate, crystal, ℔ lb. .75
Chloride, commercial, ℔ lb. .05@.10
pure, ℔ lb. .16
Iodide, ℔ oz. .40
Nitrate, ℔ lb. .06½@.07½
Sulph., Am. prime white, ℔ ton $17.50@$19
Sulph., foreign, floated, ℔ ton. .$21@$23
Sulph., off color, ℔ ton .$11.50@$14.00
Carb., lump, f. o. b. L'pool, ℔ ton .£6
No. 1, Casks, Runcorn, " " .£4 10 0
No. 2, bags, Runcorn, " " .£3 15 0
Bauxite—℔ ton .$10.00
Bichromate of Potash—Scotch, ℔ lb. .11@.12
American, ℔ lb. .11@.12
Bichromate of Soda—℔ lb. .09½@.10
Borax—Refined, ℔ lb., in car lots .08@.09
San Francisco .08@.08½
Concentrated, in car lots .07½@.08
Refined, Liverpool ℔ ton .£2
Bromine—℔ lb. .15@0.2
Cadmium Minion—℔ lb. .$2.00
Cadmium Iodide—℔ lb. .$5.50
Chalk—℔ ton .$1.10@$1.75
Precipitated, ℔ lb. .05@.06
China Clay—English, ℔ ton .$13@$18.00
Domestic, ℔ ton .$9@$11
Chlorine Water—℔ lb. .10
Chrome Yellow—℔ lb. .10@.25
Chrome Iron Ore—℔ ton, San Francisco .$10.00
Chromalum—Pure, ℔ lb. .40
Commercial, ℔ lh. .12
Cobalt—Oxide, ℔ lb. .$1.90@$2.00
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary, ℔ lb. 03¼@.0[illegible]
" " extra .04½
Nitrate, ℔ lb. .40
Copperas—Common, ℔ 100 lbs. .90@$1.00
Best, ℔ 100 lbs. .$1.35@$1.50
Liverpool, ℔ ton, in casks .£2@£2 10s.
Corundum—Powdered, ℔ lb. .04½@.09
Flour, ℔ lh. .03
Cryolite—Powdered, ℔ lb., bbl. lots. .07
Emery—Grain, ℔ lb. (℔ kg.) .04½@.05
Flour, ℔ lb. .02½@.10
Epsom Salt—℔ lb. .01@.01½
Feldspar—Ground, ℔ ton. .$6.00@$10.00
Crude .$2.00@$3 00
Fluorspar—Powdrd, No. 1, ℔ ton. $20@$30
Lump, at mine .$6@$8
French Chalk—
Fuller's Earth—Lump, ℔ ton. $16@$20
Glauber's Salt—in bbls., ℔ lb. .01@.01¼
Glass—Ground, ℔ lb. .10
Gold—Chloride, pure, crystals, ℔ oz. $1 .00
pure, 15 gr., o. v., ℔ doz. $5.40
liquid, 15 gr., g. s. v., ℔ doz. .$5.50
Chloride and sodium, ℔ oz. .$6.00
15 gr., c. v., ℔ doz. $2.88
Oxide, ℔ oz. .$27.25
Gypsum—Calcined, ℔ bbl. .$1.25@$1.50
Land Plaster .
Iodine—Resublimed .$3.30@$3 35
Iridium—Oxide ℔ lb. .$90
Iron—Nitrate, 40°, ℔ lb. .01@.01½
47°, ℔ lb. .02@.02½
Kaolin—*See China Clay.*
Kieserite—℔ ton .$9@$10
Lead—Red, American, ℔ lb .06¾@.07½
White, American, in oil, ℔ lb. .06½@.07½
White, English, ℔ lb., in oil .08½@.08¾
Acetate, or sugar of, white .06@.06½
Granulated .
Nitrate .09@.10
Lime Acetate—Am. Brown .90@.95
" Gray .$1.75@$1.87½
Litharge—Powdered, ℔ lb. .06¾@.07½
English flake, ℔ lb. .09@.09½
Magnesite—Crude, ℔ ton of 1,015 kilos .$14.75
Calcined, ℔ ton of 2,240 lbs .$22.00
Brick, ℔ ton of 2,240 lbs .$47.50
Manganese—Ore, per unit .23@.28
Oxide, ground, ℔ lb. .02½@.06½
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. .62@.64
Powdered, ℔ lb. .50
Marble Dust—℔ bbl. .$1.25
Metallic Paint—Brown ℔ ton. $20@$25
Red .$20@$25
Mineral Wool—Ordinary slag .01½
Ordinary rock .02½
Ground, ℔ ton .
Mica—In sheets according to size, 1st quality, ℔ lb. .25@$6.00
Naphtha—Black .
Nitre Cake—℔ ton .$10.00
Ochre—Rochelle, ℔ lb. .$1.10@$1.50
Washed Nat Oxf'rd, Lump, ℔ lb. 06½@.06¾
Washed Nat Oxf'rd, Powder, ℔ lb. 07@.07½
Golden, ℔ lb. .03@.05
Domestic, ℔ ton .$12@$20
Oils, Mineral—
Cylinder, light filtered, ℔ gal. .14@.16
Dark filtered, ℔ gal. .10@.13
Extra cold test, ℔ gal. .20@.24
Dark steam refined, ℔ gal. .09@.17
Phosphorus—℔ lb. .50@.55
Precip., red, ℔ lb. .82@.85
white, ℔ lb. .85@.90
Platinic Chloride—℔ oz. .$7
Plumbago—Ceylon, ℔ lb. .04@.05
American, ℔ lb. .05@.07
Potassium—Cyanide, ℔ lh., C. P. .70
67%, ℔ lb. .45
fused .40
Bromide, domestic, ℔ lb. .25@.28
Chlorate, English, ℔ lb. .14@.15
Chlorate, powdered, English, ℔ lb. .14½@.15½
Carbonate, ℔ lh., hy casks, 82% .04½@.05
Caustic, ℔ lb., pure slick .06@.06½
Iodide, ℔ lb. .$2.58@$2.80
Nitrate, refined, ℔ lh. .06@.08
Bichromate, ℔ lb. .10@.11½
Yellow Prussiate, ℔ lb. .23
Red Prussiate, ℔ lb. .42@.45
Pumice Stone—Select lumps, lb 03½@.15
Original cks., ℔ lb. .01½@.02
Powdered, pure, ℔ lb. .01½@.01¾
Pyrites—Non-cupreous, p. units. .12@.15
Quartz—Ground, ℔ ton .$6.00@$10.00
Rotten Stone, Powdered, ℔ lb. .03¼@.03½
Lump, ℔ lb. .06@.07
Original cks, ℔ lb. .04½@.05½
Rubbing stone, ℔ lb. .03½@.04
Sal Ammoniac—lump, in hhls., ℔ lb. .80½
Salt—Liverpool, ground, ℔ sack .700
Domestic, fine, ℔ ton .$7@$7.5
Common, fine, ℔ ton .$4.50@$5
Turk's Island, ℔ bush .28@.28
Salt Cake—℔ ton .$10.0 @$15.00
Saltpeter—Crude, ℔ lb. .03½@.04
Soapstone—Ground, ℔ ton .$6@$
Block and slab according to size.
Sodium—Prussiate, ℔ lb. .22@.24
Phosphate, ℔ lb. .04@.05
Stannate, ℔ lb. .06@.12
Tungstate, ℔ lb. .
Hyposulphite, ℔ lb., in casks .0235@.0245
Strontium—Nitrate, ℔ lb. .03¾@.09
Sulphur—Roll, ℔ lb. .02½
Flour, ℔ lb. .02¾
Sylvinit, 27@35%, S.O.P., per unit .40
Talc—Ground French, ℔ lb. .01¼@ 01½
American No. 1, ℔ lb. .01¼@ 01½
American No. 2 .006
Terra Alba—French, ℔ lb. .65@.80
English, ℔ lb. .60@.80
American, No. 1, ℔ lb. .60@.70
American, No. 2, ℔ lb. .45@.50
Tin—Crystals, in kegs or bbls. .14@.10
feathered or flossed. .20
Muriate, single .07@.05
Double or strong, 54° B. .10@.15
Oxymur, or nitro .19
Vermillion—Imp. English, ℔ lb. .85@.90
Am. quicksilver, bulk .57 @.6[illegible]
Am. quicksilver, bags .58 @ .6[illegible]
Chinese .85 @$1.00
Trieste .90 @ .95
American .11½@ .12
Zinc White—Am., Dry, ℔ lb. .04½@ .05
Antwerp, Red Seal, ℔ lb. .06½@.07
Paris, Red Seal, ℔ lb. .07¾@.08
Muriate solution .06
Sulphate crystals, in bbls., ℔ lb. .03¾

THE RARER METALS.

Aluminum—℔ lb. .50@.65
Arsenic—(Metallic), per lb. .40
Barium—(Metallic), per gram .$4.00
Bismuth—(Metallic), per lb. .$2.25
Cadmium—(Metallic), per lb. .$1.00
Calcium—(Metallic), per gram .$10.00
Cerium—(Metallic), per gram. .$7.50
Chromium—(Metallic), per gram. .$1.00
Cobalt—(Metallic), per lh. .$6.00
Didymium—(Metallic), per gram. .$9.00
Erbium—(Metallic), per gram. .$7.50
Gallium—(Metallic), per gram .$140.00
Glucinum—(Metallic), per gram .$12.00
Indium—(Metallic), per gram. .$9.00
Iridium—(Fused), per oz. .$12.00
Lanthanum—(Metallic), per gr. .$10.00
Lithium—(Metallic), per gram .$10.00
Magnesium—(Powdered), per lb. .$4.00
Manganese—(Metallic), per lb. .$1.10
Chem. pure, per oz. .$10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), per gram .$5.00
Osmium—(Metallic), per oz. .$65.00
Palladium—(Metallic), per oz. .$35.00
Platinum—(Plate), per oz. .$9.75
Potassium—(Metallic), per lb. .$28.00
Rhodium—(Metallic), per gram .$5.00
Ruthenium—(Metallic), per gm. .$5.50
Rubidium—(Metallic), per gram. .$2.00
Selenium—(Metallic), per oz. .$1.80
Sodium—(Metallic), per lb. .50@.75
Strontium—(Metallic), per gm. .60
Tantalium—(Metallic), per gram. .$9.00
Telurium—(Metallic), per lb. .$5.00
Thallium—(Metallic), per gram .20
Titanium—(Metallic), per gram .$2.20
Thorium—(Metallic), per gram .$17.00
Tungsten—(Metallic), per lb. .80
Uranium—(Oxide), per lb. .$5.00
Metallic, per gm. .20
Vanadium—(Metallic), per gm .$22.00
Yttrium—(Metallic), per gram .$9.00
Zirconium—(Metallic), per oz .$65.00

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Mar. 11		Mar. 13		Mar. 14.		Mar. 15.		Mar. 16		Mar 17		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.													
Alice, Mont.													
Amador, Cal.													
Atlantic, Mich.													
Belcher, Nev.													
Belle Isle, Nev.													
Bodie Cons., Cal.													
Bos. & Mont., Mont													
Breece, Colo.							.50						100
Bulwer, Cal.													
Caledonia, S. Dak.			1.00								.80		410
Catalpa, Colo.													
Chrysolite, Colo.	.20												300
Colorado Central, Colo.													
Commonwealth, Nev.													
Comstock T. bonds, Nev.													
" scrip., Nev.													
Cons. Cal. & Va., Nev.	2.60								2.55				200
Crown Point, Nev.													
Deadwood, Dak.													
Enterprise													
Eureka, Cons., Nev.													
Father de Smet, Dak.													
Freeland, Colo.													
Gould & Curry, Nev.													
Grand Prize, Nev.													
Hale & Norcross, Nev.													
Homestake, Dak.													
Horn Silver, Utah.	3.20												200
Independence, Nev.													
Iron Hill, Dak													
Iron Silver, Colo													
Leadville Cons., Colo.	.19				.18								600
Little Chief, Colo.							.20						200
Martin White, Nev													
Minnesota Iron													
Mt. Diablo, Nev.													
Navajo, Nev.													
N. Belle Isle, Nev													
Ontario, Utah.							15.00						10
Ophir, Nev							1.80		2.00		2.00		100
Overman, Nev													
Plymouth, Cal.							1.00		.75				550
Quicksilver, Pref., Cal.													
" Com., Cal.					2.00								100
Quincy, Mich.													
Robinson Cons., Colo.							.35						100
Savage, Nev.							.50		.70	.65			500
Sierra Nevada, Nev.													
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Min. of L. Valley													
Small Hopes, Colo.													
Standard Cons., Cal.			1.55		1.50								50
Yellow Jacket, Nev													

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Mar. 11.		Mar. 13		Mar 14.		Mar 15.		Mar. 16.		Mar. 17.		SALES
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha., Nev.													
Alta, Nev.													
American Flag, Colo.													
Andes, Cal.													
Astoria, Cal.													
Augusta, Ga.													
" bonds.													
Barcelona, Nev													
Belmont, Cal.	.22								.22		.23		.22	400
Best & Belcher, Nev.	1.60								1.50					200
Bonanza King, Cal.														
Brunswick, Cal.							.06				.06		.05	3,800
Bullion, Nev.														
Butte & Bost., Mont.														
Castle Creek, Idaho.	.03													1,000
Chollar	.70													100
Comstock T., Nev.	.16										.11			400
Con. Imperial, Nev.														
Cou. Pacific, Cal.														
Crescent, Colo.														
Del Monte, Nev.														
El Cristo, Rep. of Col.	.50	.49	.49	.45	.49		.18	.16	.50	.41	.51	.47		10,200
Emmett, Colo														
Exchequer, Nev.														
Independence, Nev.														
Julia, Nev.														
Justice, Nev														
Kentuck, Nev														
Lacrosse, Colo.														
Lee Basin, Colo.														
Mexican, Nev.	1.85								1.75		1.70	1.65	1.66	450
Middle Bar, Cal.														
Monitor, Colo.														
Monte Cristo, N. S. of C.	3.20	3.15	3.15		3.15						3.15			2,000
Nevada Queen, Nev.														
N. Standard, Cal.														
N. Commonwealth, Nev.														
Occidental, Nev.														
Oriental & Miller, Nev.														
Phœnix Lead, Colo.														
Phœnix of Ariz.														
Potosi, Nev.														
Rappahannock, Va.														
S. Sebastian, S. Sal.														
Santiago.														
Scorpion, Nev.														
Seg. Belcher, Nev														
Shoshone, Idaho.														
Silver Hill, Nev														
Sullivan Con., Dak.														
Sutro Tunnel, Nev.														
Syndicate, Cal.														
Tornado Con., Nev.	.05	.04							.06				.06	1,400
Union Cons., Nev.									.95		.95	.90		325
Utah, Nev														

*Ex-dividend. †Dealt in in New York Stock Ex Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 4,450. Non-dividend shares sold, 20,275. Total shares sold, 24,645.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Mar. 10.		Mar. 11.		Mar. 13.		Mar. 14.		Mar. 15.		Mar. 16.		SALES.
Atlantic, Mich.							9.75						100
Bodie, Cal.													
Bonanza Development.													
Bost. & Mont., Mont.	31.50	31.13	31.25	31.00			31.25	31.13	31.50	31.00	31.00		921
Breece, Colo.													
Calumet & Hecla, Mich.	305												12
Catalpa, Colo.													
Central, Mich.													
Cœur d'Alene, Id.													
Con. Cal. & Va., Nev.													
Dunkin, Colo													
Eureka, Nev.													
Franklin, Mich.	12.75	12.38									13.00		300
Honorine, Utah.													
Horn Silver, Utah.													
Kearsarge, Mich.	9.50		9.50				10.00		9.50		9.50	9.00	530
Lake Superior, Iron.									25.50				50
Little Pittsburg, Colo.													
Minnesota Iron, Minn.													
Napa, Cal.													
Ontario, Utah.													
Osceola, Mich.			36.00	35.50			36.00	35 25	35.50		35.00	34.88	572
Quincy, Mich.													
Ridge, Mich.													
Sierra Nevada, Nev.													
Silver King, Ariz.													
Stormont, Utah.													
Tamarack, Mich.			162				165		161	160	160		44
Tecumsen, Mich.													

NAME OF COMPANY.	Mar. 10.		Mar. 11.		Mar. 13.		Mar. 14.		Mar. 15.		Mar. 16.		SALES.
Allouez, Mich.											.75		100
Arnold, Mich.													
Aztec, Mich.													
Brunswick, Cal.													
Butte & Boston, Mont.	10.13	10 00	10 00										
Centennial, Mich.	8.25		8.13	8.00						10.38		10 25	10.00	750
Colchis, N. Mex.											8.38	8.25	515
Copper Falls, Mich.													
Crescent, Colo.													
Dana, Mich.													
Don Enrique, Mex.													
Geyser, Colo.													
Hanover, Mich.													
Humboldt, Mich.													
Hungarian, Mich.													
Huron, Mich.													
Mesnard, Mich.													
National, Mich.									1.13				100
Native, Mich.													
Oriental & M., Nev.													
Phœnix, Ariz.													
Pontiac, Mich.													
Rappahannock, Va.													
Santa Fe, N. Mex.													
Shoshone, Idaho.													
South Side, Mich.													
Tamarack, Jr., Mich.									20.00				
Washington, Mich.											23.00	20.00	150
Wolverine, Mich.	2.50									2.75			400

Dividend shares sold, 3,582. Non-dividend shares sold, 2,035. Total shares sold, 4,621.

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and amount of last			Dividends. Total paid.	Date & amount of last.		
1	Adams, s. L. C.	Colo..	$1,500,000	150,000	$10				$637,500	Jan..	1892	.05
2	Alaska-Treadwell, g.	Alska	5,000,000	200,000	25				1,150,000	Oct.	1892	.37½
3	Alice, s.	Mont.	10,000,000	400,000	25				975,000	Nov..	1891	.06¾
4	Alma & Nel Wood., g	Idaho	300,000	30,000	10				60,000	Jan..	1893	.50
5	Amador, G.	Cal.	1,250,000	250,000	5				31,250	Aug..	1890	.12½
6	American, G	Colo..	3,000,000	300,000	10				225,000	Mar..	1892	.05
7	American Belle, s.g.c	Colo.	2,000,000	400,000	5				50,000	April	1891	.12½
8	Americ'n & Nettie, g.s	Colo..		300,000					175,000	Mar..	1892	.05
9	Atlantic, c.	Mich.	1,000,000	40,000	25	280,000	April	1875	$1.00	700,000	Feb..	1891	1.00
10	Argenta, s.	Nev..	10,000,000	100,000	100	335,000	July.	1889	.10	40,000	Feb..	1880	.20
11	Argyle, G.	Colo..	1,000,000	1,000,000	1					20,000	Mar.	1892	.01
12	Aspen Mg. & S., s. L..	Colo..	2,000,000	200,000	10					704,000	Sept.	1892	.10
13	Aurora, t.	Mich..	2,500,000	100,000	25					650,000	Feb..	1893	2.00
14	Badger, s.	Ont..	250,000	50,000	5					37,500	Mar.	1890	.25
15	Bald Butte	Mont	250,000	250,000	1					72,500	Mar..	1892	.03
16	Bates Hunter, s. g.	Colo..	1,000,000	1,000,000	1						Dec..	1891	.03¾
17	Belle Isle, s.	Nev..	10,000,000	100,000	100	220 00	Aug.	1892	.10	300,000	Dec..	1879	.25
18	Belcher, s. G.	Nev..	10,400,000	104,000	100	3,16 100	May	1892	.25	15,397,000	April	1876	1.00
19	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	1. 000	Dec..	1889	.25	200,000	Jan..	1890	.19
20	Best Friend	Colo.	1,000,000	1,000,000	1					90,000	Feb..	1892	.01
21	Bi-Metallic, s. G.	Mont.	5,000,000	200,000	25					2,22 1,000	Feb .	1893	.20
22	Bodie Con., G. I.	Cal...	10,000,000	100,000	100	0,000	June	1890	.25	1,802,572	April	1885	.50
23	Boston & Mont., G.	Mont.	2,500,000	250,000	10					520,000	June	1886	.15
24	Boston & Mont., C. &	Mont.	3,125,000	125,000	25					2,075,000	Nov..	1891	1.00
25	Brooklyn Lead, L. s.	Utah.	500,000	50,000	10					127,000	July.	1887	.05
26	Bulwer, G.	Cal...	10,000,000	100,000	10	130,000	Aug..	1889	.25	190,000	Oct..	1892	.05
27	Bunker Hill & S.s.L.	Idaho	3,000,000	300,000	10					150,000	Oct..	1888	.06⅔
28	Caledonia, G.	Dak..	10,000,000	100,000	100	505,000	May.	1885	.15	192,000	Oct..	1890	.08
29	Calliope, s.	Colo..	1,000,000	1,000,000						140,000	Jan..	1891	.00½
30	Calumet & Hecla c	Mich..	2,500,000	100,000	25	1,200,000				38,850,000	Dec.	1882	5 00
31	Centen'l-Eureka, s.L.	Utah.	1,500,000	30,000	50					607,500	Feb.	1893	.50
32	Central, C.	Mich..	500,000	20,000	25	100,000	Oct..	1861	.65	1,970,500	Feb..	1891	1.00
33	Champion, G	C		34,000	10					114,900	Dec	1892	.10
34	Chrysolite, s. L.	Colo..	10,000,000	200,000	50					1,650,000	Dec..	1884	.25
35	Clay County, G.	Colo..	200,000	200,000	1					56,000	Nov..	1891	.02
36	Clinton Con, g	Cal...	5,000,000	100,000	5					80,000	Nov.	1891	.10
37	Cœur D'Alene, s. L.	Idaho	5,000,000	500,000	10					310,000	Nov.	1891	.02
38	Colorado Central, s.L	Colo..	2,750,000	275,000	10					502,500	Jan..	1892	.05
39	Commonwealth, s.	Nev..	10,000,000	100,000	100	190,000	Sept.	1892	.10	20,000	Nov..	1890	.20
40	Confidence, s. L.	Nev...	2,496,000	24,960	100	1,589.550	Aug..	1892	.50	199,680	April	1889	1.00
41	Cons. Cal. & Va., s.G	Nev...	21,600,000	216,000	100	108,000	Jan..	1885	.20	3,682,800	Aug.	1891	.50
42	Contention, s.	Ariz..	12,500,000	250,000	50					2,637,500	Aug.	1892	.20
43	Cook's Peak, s	N. M..	2,000,000	200,000	10					114,552	Nov.	1892	.05
44	Cop. Queen Con., c	Ariz..	2,000,000	20,000	10					1,360,000	Feb.	1893	.50
45	Coptis	Nev..	10,000,000	100,000	100					67,000	July.	1892	.12
46	Cortez, s.	Nev..	1,500,000	300,000	05					687,000	Mar..	1892	.50
47	Crescent, s. L. G.	Utah!	15,000,000	300,000	25	60,000	Oct	1892	.10	233,000	Oct..	1888	.03
48	Crown Point, g. s.	Nev...	10,000,000	100,000	100	2,700,000	Sept.	1892	.25	11,898,000	Jan..	1875	2.00
49	Cumberland, L. s.	dont.	5,000,000	500,000	10					15,000	Nov.	1889	.08
	Daly, s. L.	Utah.	3,000,000	150,000	20					2,687,500	Feb..	1893	.25
	Deer Creek, s. G.	Idaho	1,000,000	200,000	5					20,000	June	1889	.05
	Deadwood-Terra, g..	Dak..	5,000,000	200,000	25					1,150,000	Oct..	1892	.05
	DeLamar, s. G.	Idaho	2,000,000	400,000	5					550,000	Oct...	1892	.25
	Derbec B. Grav., G.	Old..	10,000,000	100,000	0	100,000	Sept.	1892	.10	60,,000	Aug..	1891	.10

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.		
1	Alliance, s. G.	Utah.	$100,000	100,000	81	$120,000	Feb..	1891 .20
2	Allouez, c.	Mich.	2,000,000	80,000	25	737,000	Jan..	1890 .70
3	Alpha Con., G. s.	Nev..	3,000,000	30,000	100	209,000	Sept.	1892 .10
4	Alta, s.	Nev..	10,080,000	100,800	100	3,369,880	Jan.	1892 .10
5	American, c.	Idaho	5,000,000	50,000	100			
6	American Flag, s.	Colo..	1,250,000	125,000	1	300,000	June	1887
7	Amity, s.	Colo..	250,000	250,000	20			
8	Anchor, s. L. G.	Utah.	3,000,000	150,000	5	410,000	June	1890 .2
9	Anglo-Montana, Lt..	Mont.	600,000	120,000	125			
10	Appalachian, g.	N. C.	1,750,000	1,400,000	20			
11	Arizona, c.	Ariz..	3,575,000	160,000	2			
12	Astoria, G.	Cal...	200,000	100,000	5			
13	Atlanta, g. s	Idaho	3,250,000	650,000	25			
14	Barcelona, G.	Nev..	5,000,000	200,000	5			
15	Bear Creek	Idaho	100,000	20,000	1			
16	Belmont, G.	Cal...	500,000	500,000	100			
17	Belmont, s.	Nev	5,000,000	50,000	100	735,000	April	1886 .10
18	Best & Belcher, s. G.	Nev..	10,080,000	100,800	10	2,405,275	Aug..	1892 .25
19	Black Oak, G.	Cal...	3,000,000	300,000	100			
20	Boston Con., G.	Cal...	10,000,000	100,000	1	170,000	Nov..	1888 .25
21	Brownlow, G.	Colo..	250,000	250,000	5			
22	Brunswick, G.	Cal...	2,000,000	400,000	2			
23	Buckeye, s. L.	Mont.	1,000,000	500,000	100			
24	Bullion, s. G.	Nev.	10,000,000	100,000	100	2,890,000	Aug.	1892 .25
25	Burlington, g. s.	Cal...	10,000,000	100,000				
26	Butte & Boston, c. s..	Mont.	5,000,000	200,000	10			
27	Butte Queen, G.	Cal...	1,000,000	100,000	1	6,000	Jan..	1892 .04
28	Calaveras, G.	Cal...	500,000	500,000	5			
29	Calaveras Con., g.	Cal...	800,000	160,000	10			
30	California, c.	Cal...	1,000,000	100,000	5	9,000	Mar.	1892 .08
31	California Con. L. Q..	Cal...	2,250,000	450,000	10			
32	Camille, g	Ga	1,500,000	150,000	5			
33	Carisa, G.	Wy...	500,000	100,000	2			
34	Carupano, G. s. L. C..	Ven...	200,000	100,000	2			
35	Cashier, G. s.	Colo..	500,000	250,000	100			
36	Challenge Con., g. s..	Nev..	5,000,000	50,000	10			
37	Cherokee, G.	Cal...	1,500,000	150,000	100			
38	Chollar, s. G.	Nev..	11,200,000	112,000	2	1,320,000	May..	1892 .50
39	Cleveland, T.	Dak..	1,000,000	500,000	10			
40	Colchis, s. G.	N. M..	500,000	150,000	5			
41	Colorado, s.	Colo..	1,625,000	325,000	1			
42	Comstock, s.	Utah.	1,250,000	250,000	100			
43	Comstock Tun.	Nev..	10,000,000	100,000	100	35,000	Mar.	1887 .15
44	Con. Imperial, G. s	Nev..	5,000,000	50,000	50	2,062,500	Jan..	1892 .25
45	Con. New York, s. G.	Nev..	5,000,000	100,000	100	110,000	Mar..	1892 .10
46	Con. Pacific, G.	Cal ..	6,000,000	60,000	10	198,000	June	1890 10
47	Con. Silver, s.	Mo....	2,500,000	250,000	5			
48	Cordova Union, g.	Cal...	1,000,000	200,000	10			
49	Crescent, s. L.	Colo..	3,000,000	300,000	100			
50	Crocker, s.	Ariz..	10,000,000	100,000	1	165,000	Aug.	1892 .05
51	Crowell, G.	N. C..	500,000	500,000	1			
52	Dahlonega, G.	Ga....	250,000	250,000	10			
53	Dandy, s.	Colo..	5,000,000	500,000				
54	Decatur s.	Colo..	1,500,000	300,000				

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares No.	Shares Par	Assessments. Total Levied.	Assessments. Date and amount of last	Dividends. Total paid.	Dividends. Date & amount of last.
5*	Dexter, g. s	Nev..	1,000,000	100,000	10			80,000	Aug.. 1892 .25
56	Dunkin, s. L	Colo..	5,000,000	200 00	25	*		890,000	Oct.. 1889 .05
57	Elkhoru, s. L	Mont.	1,000,000	200 00	5	*		885,545	Dec. 1892 .50
58	Enterprise, s.	Colo..	2,500,000	500,000	5	*		750,000	Feb. 1893 .15
59	Eureka Con., s. L., G.	Nev..	1,000,000	50,000	100	550,000	June 1889 .50	5,017,500	Jan 1892 .25
50	Evening Star, s. L	Colo..	500,000	50,000	10	*		1,450,000	Dec. 1889 .2
61	Father de Smet, G	Dak..	10,000,000	100,000	100	200,000	Nov.. 1878 1.00	3,125,000	Dec.. 1885 .20
62	Franklin, c..	Mich..	1,000,000	40,000	25	220,000	June 1871	1,106,00	July 1892 2.00
63	Freelaud, s. G	Colo..	5,000,000	200,000	25	*		190,000	July.. 1886 .10
64	Garfield Lt., G. s	Nev ..	500,000	100,000	5			90,000	April 1888 .12½
65	Glengarry	Mont.	1,000,000	100,000	10			10,000	June 1891 .10
66	Gold Rock	Colo..	500,000	500,000	1				Dec.. 1891 .01
67	Golden Reward	S.Dak	1,250,000	250,000	5			75,000	Feb. 1893 .02
68	Gould & Curry, s. G	Nev...	10,800,000	108,000	100	4,591,200	June 1892 .25	3,826,800	Oct.. 1870 10.00
69	Grand Prize, s	Nev...	10,000,000	100,000	100	785,000	Jan.. 1890 .30	495,000	Mar. 1884 .25
70	Graulte, s. L	Idaho	500,000	500,000	1	*		83,400	Nov.. 1890 .02
71	Granite Mountain. s.	Mont.	10,000,000	400,000	25			12,120,000	July. 1892 .20
72	Great Western, L. Q	Cal..	5,000,000	50,000	100			394,861	Dec. 1892 .25
73	Green Mountain, G	Cal..	1,250,000	125,000	10	*		212,000	Nov.. 1881 .07½
74	Hale & Norcross, G. s.	Nev...	11,200,000	112,000	100	5,534,800	Ang. 1892 .50	1,822,000	Aug. 1888 .50
75	Hecla Cou., s. G. L. C.	Mont.	1,500,000	30,000	50			1,950,000	Feb. 1893 .50
76	Hel'a Mg.& Red,s.L.G.	Mont.	3,315,000	663,000	5	*		197,970	July.. 1886 .06
77	Helena & Frisco, s.L.	Idaho	2,500,000	500,000	5			170,000	July.. 891 .02
78	Helena & Victor	Mont.	1,000,000	200,000	5			80,000	May.. 1891 .05
79	* Holmes, s	Nev...	10,000,000	100,000	100	370,000	May. 1890 .25	75,000	April 1886 .25
80	Homestake, G	Dak..	12,500,000	125,000	100	200,000	July. 1878 1.00	4,953,750	Feb.. 1893 .10
81	Honorine, s. L	Utah.	500,000	250,000	2	37,500	April 1889 .05	125,000	Sept. 1887 .05
82	Hope, s	Mont.	1,000,000	100,000	10	*		408,252	Feb. 1893 .50
83	Horu-Silver, s. L	Utah.	10,000,000	400,000	25	*		4,650,000	Dec. 1892 .12½
84	Hubert, G	Colo..	1,000,000	1,000,000	1	*		247,000	Dec.. 1889 .00½
85	Idaho, G	Cal...	310,000	3,100	100			5,419,250	Dec. 1892 2.50
86	Illinois, s	N. M..	100,000	100,000	1	*		45,000	April 1889 .20
87	Iron Hill, s	Dak..	2,500,000	250,000	10	134,000	July. 1889 .03	156,250	Nov.. 1887 .07½
88	Irou Mountain, s	Mout.	5,000,000	500,000	10	*		215,000	Aug.. 1892 .03
89	Irou-Silver, s. L	Colo..	10,000,000	500,000	20	*		2,500,000	April 1889 .20
90	Jack Rabbit, G	Cal..	10,000,000	100,000	100	100,000	Sept. 1892 .10	260,000	Aug 1891 .10
91	Jackson, G. s	Nev ..	5,000,000	50,000	100	237,500	Nov.. 1880 .20	60,000	Jan. 1891 .10
92	Kearsarge, C	Mich..	1,000,000	40,000	25	190.000	Oct.. 1887 1.00	*80,000	Jan. 1890 2.00
93	Kennedy	Cal..	10,000,000	100,000	100			367,000	May.. 892 .15
94	Kentuck, s. G	Nev..	3,000,000	30,000	100	454.180	Oct.. 1891 .15	1,350,000	Dec. 1886 .10
95	La Plata, s. L	Colo..	2,000,000	200,000	10	*		610,000	Sept. 1882 .30
96	Leadville Con., s. L	Colo..	4,000,000	400,000	10	*		304,000	May.. 1892 .03
97	Lexington, G. s.	Mout.	4,000,000	40,000	100	*		695,000	Jan.. 1890 2.00
98	Little Chief, s. L	Colo..	10,000,000	200,000	50	*		320,000	Dec.. 1890 .05
99	Little Rule, s	Colo..	500,000	500,000	1			220,000	Dec. 1891 .02
100	Maid of Erin	Colo..	3,000,000	600,000	5			557,757	April 1892 .25
101	Mammoth, s. L	Utah	10,000,000	400,000	250	110,000	1892 .25	1,040,000	Dec.. 1891 .10
102	Martin White, s	Nev..	10,000,000	100,000	100	1,275,000	Jan.. 1892 .25	140,000	Dec.. 1886 .25
108	Mary Murphy, s. G	Colo..	350,000	3,500	101	*		175,000	May.. 1888 5.00
104	Matchless, s. L	Colo..	500,000	500,000	1	*		15,000	Feb.. 1890 .00½
105	Maxfield	Utah.	3,000,000	300,000	10			117,000	April 1892 .03
106	Mayflower, D. gravel	Cal	1,000,000	100,000	10			100,000	Dec 1892 .25
107	May Mazeppa, s. L	Colo..	1,000,000	100,000	1			205,000	Oct.. 1891 .03¾
108	Minas Prietas, G. s	Mex..	1,000,000	100,000	10	*		350,000	Dec.. 1890 .50
109	Minnesota, c	Mich..	1,000,000	40,000	25	420,000	April 1886 1.00	1,820,000	May.. 1876
110	Mollie Gibson, s	Colo..	5,000,000	1,000,000	5			3,150,000	Mar 1893 .15
111	Monitor, G	S.Dak	2,500,000	250,000	10			45,000	Oct. 1890 .03
112	Mono, G. s	Cal..	5,000,000	50,000	100	760,000	Sept. 1890 .25	12,500	Mar 1886 .25
113	Montana, Lt., G. s	Mont.	3,300,000	660,000	5	*		2,619,075	June. 1891 12½
114	Morning Star, s. L	Colo..	1,000,000	100,000	10			925,000	April 1891 .25
115	Morning Star Drift, G	Cal..	240,000	2,400	100			111,800	Dec.. 1892 3.00
116	Moulton, s. G	Mout.	2,000,000	400,000	5	*		410,000	Nov. 1892 .07½
117	Mt. Diablo, s	Nev..	5,000,000	50,000	100	137,500	June 1880 2.00	210,000	July. 1891 .20
18	Napa, G	Cal..	700,000	100,000	7			520,000	Jan.. 1893 .20
119	Navajo, G. s	Nev..	10,000,000	100,000	100	520,000	May. 1891 20	229,995	April 1889 .10
120	Newton	Cal ..	10,000,000	100,000	100			10,000	May.. 1891 .05
121	New California, G	Colo..	800,000	160,000	5	*		48,800	May.. 1890 12½
122	New Guston, s	Colo..	550,000	110,000	5			1,877.500	April 1892 .75
123	North Banner Con	Cal..	1,000,000	100,000	10			20,000	July.. 1891 .05
124	North Commonw'th	Nev..	10,000,000	100,000	10			25,000	June. 1891 .25
125	N. Hoover Hill, G. s.	N. C .	300,000	120,000	2½	*		30,000	Dec.. 1885 .06½
126	North Belle Isle, s	Nev..	10,000,000	100,000	100	474,689	Nov. 1892 .10	220,000	May .. 1888 .50
127	North Star, G	Cal..	1,000,000	100,000	10			350,000	Dec 1892 .50
128	Omaha Cons., G	Cal..	2,400,000	24,000	100			30,000	May.. 1892 .15
129	Ontario, s. L	Utah	15,000,000	150,000	100			13,175,000	Oct.. 1892 .50
130	Ophir, G. s	Nev..	10,000,000	100,000	100	4,210,640	April 1890 .50	1,595,800	Jan.. 1880 1.00
131	Original, s. C	Mout.	1,500,000	60,000	25	*		138,000	Jan.. 1889 .05
132	Oro, s. L. G	Colo..	500,000	100,000	5			95,000	July, 1890 .20
133	Osceola, C	Mich..	1,250,000	50,000	25	480,000	April 1876 1.60	1,697.500	Dec. 1892 1.00
134	Pacific Coast, B	Cal...	1,500,000	15,000	100			36,000	Dec. 1892 1.00
135	Parrot, c	Mont.	1,800,000	180,000	10			1,405,385	Dec. 1892 .10
136	Petro	Utah.	10,000,000	10,000	100			17,500	July. 1891 .75
137	Plumas Eureka, G	Cal...	1,406,250	140,625	10			2,643,559	April 1892 .18
138	Plymouth Cou, G	Cal...	5,000,000	100,000	50	*		2,280,000	Feb. 1888 .40
139	Poorman, G. s	Idaho	375,000	300,000	125	*		68,260	Sept 1892
140	Quicksilver, pref., Q	Cal	4,300,000	43,000	100			1,822,911	June 1891 1.25
141	" com., Q	Cal...	5,700,000	57,000	100			643 867	July. 1882 .40
142	Quincy, c	Mich..	1,250,000	50,000	25	200,000	Dec.. 1862	6,470,000	Feb. 1893 3.00
143	Red Cloud	Idaho	1,000,000	200,000	5			153,000	Dec. 1892 .10
144	Reed National, s. G	Colo..	500,000	500,000	1	*		50,000	Dec.. 1890 .01
145	Retriever, L	S.Dak	1,250,000	250,000	5			20,000	Aug.. 1891 .03
146	Rialto, G	Colo..	300,000	300,000	1	*		50,250	April 1892 .01½
147	Richmond, s. L	Nev.	1,350,000	54,000	25	*		4,346,213	Aug.. 1891 .25
148	Ridge, C	Mich..	500,000	20,000	25	219,939	Mar. 1886 50	99,785	Feb.. 1890 .50
149	Robinson Con., s. L	Colo..	10,000,000	200,000	50	*		585,000	Mar 1886 .05
150	Ruuulug Lode, G	Colo..	1,000,000	1,000,000	1	*		36,000	May .. 1892 00 1-10
151	Savage, s	Nev..	11,200,000	112,000	100	6,772,000	Feb.. 1892 .50	4,460,000	June 1869 3.00
152	Sberidan, s. G	Colo..	300,000	3,000	100	*		300,000	Oct.. 1891 2.50
153	Shoshone, G	Idaho	150,000	150,000	1			7,500	April 1883 .01
154	Sierra Buttes, G	Cal...	2,225,000	122,500	10			1,529,307	Oct. 1892 .18
155	Sierra Nevada, s. O	Nev..	10,000,000	100,000	100	6,411,910	June 1892 .25	102,000	Jan.. 1871 1.00
156	Sierra Nevada, s. L	Idaho	1,000,000	1,000,000	1	*		40,000	May.. 1889 .02
157	Silent Friend	Colo..	500,000	500,000	1			60,000	Aug.. 1891 .02½
158	Silver Cord, s. L. G	Colo..	4,500,000	450,000	10			265,000	April 1889 .10
159	Silver King, s	Ariz..	10,000,000	100,000	100	130,000	Nov. 1890 .30	1,950,000	July 1887 .25
160	Silver Mg.of L. V., s.L	N. M..	500,000	500,000	1			300,000	Dec.. 1891 4.05
161	Silde	Colo..	500,000	5,000	100			20,000	Nov.. 1891 4.00
162	Small Hopes Cou., s.	Colo..	5,000,000	250,000	20	*		32,00,000	Nov.. 1892 .15
163	Spring Valley, G	Cal...	200,000	200,000	1	50,000	Oct. 1888 .25	50,000	Jan.. 1881 .25
164	Standard, G. s	Cal...	10,000,000	100,000	100	100,000	June 89 .50	3,655,000	Mar.. 1892 .10
165	Stormont, s	Utah.	500,000	500,000	1	*		155,000	Nov . 1881 .05
166	St. Joseph, L	Mo..	1,500,000	150,000	10	*		1,974,000	Dec.. 1890 .02
167	Swansea, g. s	Colo..	600,000	60,000	10			27,000	Mar. 1893 .10
178	Tamarack, C	Mich..	1,250,000	50,000	25	520,000	Aug. 93 3.00	3,160,000	Oct. 1892 .00
169	Teal & Poe	N. M..	150,000	150,000	1			9,000	Nov. 1891 .01½
170	Tombstone, G. s. L	Ariz..	12,500,000	300,000	25	*		1,250,000	April 1882 .10
171	United Verde, C	Ariz.	3,000,000	300,000	10	*		207,500	Jan.. 1892 .10
172	Viola Lt., s. L	Idaho	750,000	150,000	5			337,500	Nov. 1885 .37½
173	Ward Con., s	Colo.	2,000,000	200,000	10			20,000	Dec. 1889 .05
174	Woodside, s. L	Utah	100,000	100,000	10			25.000	Oct.. 1885 .25
175	W. Y. O. D	Cal..	30,000	15,000	2	22,500	May. 1891 .10	42,000	Dec. 1892 .10
176	Yankee Girl, s	Colo.	1,300,000	260,000	5			1,406,000	April 1891 1.50
177	Yellow Jacket, G. s.	Nev	12,000,000	120,000	10	5,808,000	Sept 1892 .25	2,184,000	Aug. 1871 1.50
178	Yosemite No. 2	Utah.	1,000,000	100,000	10			25,000	Oct.. 1891 .05
179	Young America, G	Cal...						175,000	Jan.. 1889 1.00

NON DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares No.	Shares Par	Assessments. Total levied.	Assessments. Date and am't of last.
55	Denver City, s	Colo..	5,000,000	500,00	11	*	
56	Denver Gold, G	Colo..	300,000	60,000	5		
57	Dickens-Custer, s	Idaho	2,100,000	420,000	5		
5	Durango, G	Colo..	500,000	500,000	1	*	
59	Eastern Dev. Co., Lt	N. S..	1,500,000	150,000	10	990,000	Mar. 1886 1.00
60	El Dorado, G	Cal..	1,000,000	250,000	4	*	
61	El Talento, G	U.S.C.	1,000,000	500,000	2		
62	Emma, s	Utah.	625,000	500,000	12		
63	Emmons, s. L	Colo..	2,000,000	2,000,000	1		
64	Empire, s	Utah.	10,000,000	100,000	100		
65	Eureka Tunnel, s. L	Nev..	10,000,000	100,000	100	*	
66	Exchequer, s. G	Nev..	10,000,000	100,000	100	940,000	Jan.. 1892 .25
67	Found Treasure, G. s.	Nev..	10,000,000	100,000	100	130,500	Jan.. 1892 .50
68	Gogebic I. Syn., I	Wis..	5,600,000	200,000	25		
69	Gold Bank, g. s	Colo.	250,000	250,000	1	*	
70	Gold Cup, s	Colo..	500,000	500,000	1	*	
71	Golden Era, s	Mont.	2,000,000	200,000	10	*	
72	Gold Flat, G	Cal.	1,000,000	100,000	10	5,000	Mar.. 1892 .05
73	Gold King, g	Colo..	1,650,000	350,000	5		
74	Gold Rock, G	Cal..	1,000,000	500,000	2		
75	Golden FeatherCa., g	Cal..	900,000	180,000	5		
76	Goodshaw, G	Cal..	10,000,000	100,000	100	*	
77	Goodyear G. s. L	Mont.	1,000,000	200,000	5	13,000	Feb.. 1892 .01
78	Grand Belt, c	Tex..	12,000,000	120,000	100		
79	Grand Canyon, s	Ariz..	375,000	75,000	5		
80	Grand Duke, s	Colo..	800,000	80,000	10		
81	Gregory Con., G	Mont.	3,000,000	300,000	10		
82	Harlem M. & M. Co., G.	Cal..	1,000,000	200,000	5		
83	Hartery Con., G	Cal..	1,000,000	100,000	10	22,000	Oct.. 1890 .05
84	Hartshorn, g s. l.	S.Dak	1,250,000	250,000	5	8,750	Sept. 1891 .00½
85	Head Cent. & Tr., s. G	Ariz..	10,000,000	100,000	100	16,981	Mar.. 1892 .03
86	Hector, G	Cal..	1,500,000	300,000	5	45,000	Jan.. 1889 .15
87	Highland, c	Mich..	500,000	25,000	20		
88	Himalaya, g. s l	Utah.	1,800,000	180,000	10	12,800	Oct. 1892 .00½
89	Holywood	Cal..	200,000	100,000	2		
90	Hortense, s	Colo..	2,000,000	200,000	10		
91	Huron, c	Mich..	1,000,000	40,000	25	280,000	May.. 1887 3.00
92	Idaho, g. s	Idaho	1,250,000	250,000	5		
93	Inez, s. L	Idaho	1,000,000	1,000,000	1		
94	Ingalls, g	Colo..	100,000	20,000	5		
95	Ironton, I	Wis.	1,000,000	40,000	25		
96	Iroquois, c	Mich.	1,250,000	50,000	25		
97	Kentuck Con	Nev..	10,500,000	105,000	00	57,750	July. 1892 .10
98	J. D. Reymert, s	Ariz..	10,000,000	100,000	100		
99	Julia Con., G. s	Nev...	11,000,000	110,000	100	1,463,000	Jan.. 1889 .10
100	Justice, g. s. c	Colo.	500,000	500,000	1	*	
101	Lacrosse, G	Colo..	1,000,000	100,000	10	*	
102	La Cunibre, g. s	Mex..	150,000	3,000	50	*	
103	Lee Basin, s	Colo..	5,000,000	500,000	10	*	
104	Little Josephine, s	Colo.	250,000	50,000	5		
105	Lone Star Cons., G	Cal..	500,000	500,000	1	10,000	April 1892 .00½
106	Lynx Creek, g	Ariz..	237,500	147,500	5		
107	Madeleine, G. s. L	Colo..	750,000	50,000	1	4,500	Feb. 1892 .00½
108	Mammoth Gold, G	Ariz..	245,000	49,000	5	*	
109	Mayflower Gravel, G.	Cal..	1,000,000	100,000	10	*	
110	Medora, G	Dak..	250,000	250,000	1	585,000	Mar. 189 .56
111	Merrimac Con., G. s.	Colo..	5,000,000	500,000	10		
112	Mexican, G. s	Nev...	10,000,000	100,000	100	2,917,56	ct.. 1892 .50
113	Michigan, G s	Mich..	2,500,000	100,000	25	40,000	Mar. 1892
114	Middle Bar, G	Cal..	400,000	200,000	2	*	
115	Mike & Starr, s. C	Colo.	1,000,000	200,000	5	*	
116	Milwaukee, s	Mont.	500,000	500,000	1	*	
117	Minah Cons	Mont.	1,250,000	250,000	5		
118	Modoc Chief, I s. g.	Idaho	1,000,000	200,000	5	5,000	Jan.. 1892 .00½
119	Monitor, G	Colo..	100,000	100,000	1	12,500	May. 1891 .0
120	Montreal, G. s. L	Utah.	750,000	150,000	5	4,500	Feb.. 1892 .00½
121	Mountain Ledge, g	Cal.	500,000	100,000	5		
122	Mount McClellan	Colo.	1,500,000	300,000	5		
123	Mutual Mg. & sm	W'sh.	100,000	100,000	1	*	
124	Native, c	Mich.	1,000,000	40,000	25		
125	Neath, G	Colo..	1,000,000	100,000	10		
126	Nelson	Cal..	50,000	10,000	5		
127	Nevada Queen, s	Nev...	10,000,000	100,000	100	200,000	Oct.. 1889 .25
128	New Germany, G	N. S..	100,000	100,000	1	*	
129	New Gold Hill	N. C	1,750,000	350,000	5		
130	New Pittsburg, s. L	Colo..	2,000,000	200,000	10	*	
131	New Queen Gold, s	Colo..	800,000	160,000	5		
132	North Standard, G	Cal..	10,000,000	100,000	100	20,000	Nov	
133	Occidental Con., g. s		10,000,000	100,000	100	245,000	April 1892 .25
134	Oneida Chief, G	Cal..	500,000	125,000	100	*	
135	Oriental & Miller, s.	Nev...	10,000,000	400,000	100		
136	Original Keystone, s.	Nev..	10,000,000	100,000	100	250,000	Mar.. 1892 .10
137	Osceola, G	Nev...	5,000,000	500,000	10	*	
138	Overman, G. s	Nev...	11,520,000	115,200	100	4,001,840	May. 1892 .10
139	Park, s	Utah.	2,000,000	200,000	10		
140	Parker, g	N. C.	750,000	180,000			
141	Pay Rock, s	Colo.	1,000,000	200,000	5		
142	Peer, s	Ariz..	10,000,000	100,000	100	190,000	Feb.. 1892 .10
143	Peerless, s	Ariz..	10,000,000	100,000	100	405,000	Oct.. 1890 .15
144	Pennsylva'a Cons., G	Cal..	5,150,000	515,000	10	36,050	Feb.. 1892 .10
145	Phœnix, g	Ariz..	500,000	500,000	1	*	
146	Phœnix Lead, s. L	Colo..	100,000	100,000	1	*	
147	Pilgrim, G	Cal..	600,000	300,000	2	*	
148	**Ploche M. & R., s. G. L	Utah.	20,000,000	2,000,000	10		
149	Poorman, Ltd., s. L	Idaho	250,000	50,000	5		
150	Potosi, s	Nev...	11,200,000	112,000	100	1,573,000	Mar.. 1890 .50
151	Pronalite, s	Idaho	250,000	250,000	1	*	
152	Puritan, s. G	Colo..	1,500,000	150,000	10	*	
153	Quincy, c	Colo..	3,000,000	300,000	10		
154	Rainbow, g	S.Dak	1,250, 000	250,000	5	4.250	July. 1892 .00½
155	Rappahannock, G. s.	A....	250,000	250,000	1	*	
156	Red Elephant, s	Colo..	500,000	500,000	1	*	
157	Red Mountain, s	Colo..	300,000	60,000	5		
158	Ropes, G. s	Mich..	2,000,000	80,000	25	167,200	Feb. 1891 .50
159	Ruby & Dun., s. L. G	Nev..	25,300	506	50		
160	Russell, G	N. C..	1,500,000	300,000	5		
161	Sampson, G. s. L	Utah.	10,000,000	100,000	100	288,15	July. 1888 1.08
162	Seal of Nevada, G. s.	Nev..	5,000,000	100,000	50		
163	Silver Age, s l. g	Colo.	2,000,000	200,000	10	*	
164	Silver Bell, s	Ariz..	850,000	170,000	5		
165	Silver King, s	Cal. .	2,000,000	400,000	5		
166	Silver Queen, C	Ariz..	5,000,000	200,000	25	*	
167	Silverton, s	Colo,.	300,000	60,000	5		
168	Siskiyou Con., L	Cal...	2,000,000	200,000	10	13,000	May.. 1892 .01½
169	South Bulwer, G	Cal..	10,000,000	100,000	100	100,000	May. 1881 .25
170	South Hite, g	Cal..	10,000,000	100,000	100	195,000	Jau.. 1883 .05
171	South Pacific, g	Cal...	500,000	100,000	5		
172	Stanislaus, G	Cal...	2,000,000	200,000	10		
173	St. Kevin, s. G	Colo.	100,000	100,000	1	*	
174	St. Louis & Mex., s	Mex..	500,000	500,000	10	*	
175	St. Louis & St. Elmo	Colo..	000,000	200,000	10		
176	St. L. & St. Felipe, G. s.	Mex.	500,000	150,000	10		
177	St. L. & Sonora, G. s.	Ariz..	3,000,000	300,000	10	*	
178	Stenwinder, i. s	Idaho	500,000	500,000	1		
179	Sunday Lake, I	Mich..	1,250,000	50,000	25		
180	Sullivan Con., G	Dak..	600,000	200,000	3	*	
181	Sylvanite, s	Colo..	5,000,000	500,000	10	*	
182	Taylor-Plumas, G	Cal...	325,000	65,000	5	3,575	Mar.. 1892 .01½
183	Telegraph, g. s	Cal...	325,000	65,000	5	3,575	Mar. 1892 .01½
184	Telegraph, G. s	Mex..	100,000	100,000	1	70,000	Feb.. 1892 .10
185	Teresa, G. s	Cal...	1,000,000	200,000	5	10,000	Feb.. 1888 .10
186	Tioga Con., G	Nev...	10,000,000	100,000	10	295.000	May. 1888 .25
187	Tornado Con., G. s.	Nev...	100,000	100,000	1	*	
188	Tuscarora, s	Nev...	10,000,000	500,000	20	385,000	Jan.. 1892 .25
189	Union Con., G. s	Nev...	10,000,000	100,000	100	370,000	June 1892 .25
190	Utah, s	Nev..	10,000,000	100,000	100	245,000	Aug.. 1890 .25
191	Ute & Ulay, s. L	Colo..	1,000,000	50,000	2	1,500	Mar.. 1892 .0018
192	Valley, g	Cal.	575.000	460,000	125		
193	Wall Street, G. s. L	Colo..	500,000	500,000	1		
194	Washington, C	Mich..	1,000,000	40,000	5		
195	West Argentine, s	Colo..	750,000	150,000	5		
196	West Granite Mt., s.	Mont.	500,000	100,000	5	*	
197	Whale, s	Mont.	5,000,000	500,000	10	*	
198	Wood River, g	Idaho	2,000,000	200,000	10	3,000	Aug. 1891 .00½
199	Yuma, c. s. G	Ariz..	10,000, 000	400,000	2		
200	Zelaya, G. s	A	600,000				
201							

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. *Non-assessable. †This company, as the Western, up to December 10th, 1881, paid $1,400,000. ‡Non-assessable for three years. §The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000. Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Cons. Virginia $42,?90,000. **Previous to the consolidation of the Copper Queen with the Atlanta. August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶This company paid $190,000 before the reorganization in 1880. ** This company acquired the property of the Raymond & Ely Company which had paid $3,075.000 in dividends. *** Previous to this company's acquiring Northern Belle, that mine declared $2,400.000 in dividends against $425.000 in assessments

COAL AND COAL RAILROAD STOCKS.

NAMES OF STOCKS.	March 11. H.	March 11. L.	March 13. H.	March 13. L.	March 14. H.	March 14. L.	March 15. H.	March 15. L.	March 16. H.	March 16. L.	March 17. H.	March 17. L.	Sales.
Am Coal	.....	.....	.....	.....	90	.....	.....	.....	.....	.....	.....	.....	109
Balt. & Ohio	93	.....	.....	.....	.....	.....	91	.....	91¼	.....	91	.....	410
do pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buff., R. P.	.....	.....	.....	.....	.....	.....	.....	.....	33½	.....	33½	33	300
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cambria Iron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & Ohio	22¾	22⅝	.....	.....	23⅛	.....	.....	.....	22½	.....	23⅛	22½	4,193
do. 1st pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do 2d pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. C. & I	.....	.....	20	.....	.....	.....	19¼	.....	.....	.....	19⅝	19¾	976
Col. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Fuel	67¼	66¾	67	66¼	66⅜	66	66⅜	.....	.....	.....	66	64¾	2,910
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col., H. V. & Tol.	27⅝	.....	28	27	27¼	26⅜	26½	25	27	26½	27½	.....	2,885
do. pfd	.....	.....	.....	.....	69	.....	.....	.....	.....	.....	.....	.....	100
Col. & H. Coal	18	17¾	18	17¾	.....	.....	.....	.....	.....	.....	.....	.....	900
do. pfd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Coal	.....	.....	.....	.....	.....	.....	29	.....	.....	.....	.....	.....	100
Del. & Hud. C	127¼	127	128¾	127	127¼	126	126	125	126	125	126⅞	126	8,497
Del., L. & West.	144¾	143⅝	144¼	143½	144	141½	141	138¼	139	137¼	140	138¾	135 065
Hunt. & B. Top.	37	.....	37½	37	.....	.....	.....	.....	37⅜	37½	.....	.....	800
do pref	51	50¾	52¼	51	52½	52¼	53	.....	21⅜	21¼	22	21	589
Lake Erie & Wes	.....	.....	22	.....	.....	.....	21⅜	21¼	22	21	21¾	.....	1,800
do. pref.	.....	.....	.....	.....	76¾	76	.....	.....	75	.....	75¾	75	2,978
Lehigh C. & N.	51⅝	.....	51⅞	.....	51⅝	.....	51⅜	51	52	51½	.....	.....	714
Lehigh Valley	49	48½	49⅝	48¾	49¼	48¾	47⅜	46¾	47¾	46¾	.....	.....	6,010
Mahoning Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	.....	.....	22	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Morris & Essex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Cent. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. Central	116¾	116¼	117¼	.....	116½	116¼	116¼	115¼	116¾	114¼	116½	116	4,620
N. Y., L. & W.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., L. E. & W	21⅜	21¼	21¼	20⅝	21¼	20⅝	21¼	20⅝	20⅝	19⅞	20⅜	19⅝	39,921
do. pref	.....	.....	47	.....	47¾	47½	47	.....	.....	.....	47¾	44¼	1,160
N. Y., Susq. & W	17¼	17	.....	.....	17¼	16½	16½	16¼	16½	16¼	17¼	16¾	4,625
do. pref	66⅜	.....	68½	.....	68	67	67½	66½	67¼	66⅜	68	67¼	2,020
N. & West	.....	.....	.....	.....	78¼	.....	83¼	.....	.....	.....	.....	.....	200
do. pref	.....	.....	82	.....	.....	.....	81	.....	.....	.....	.....	.....	110
Penn. R. R	53⅝	53¼	53⅝	53⅜	53⅜	53½	53⅜	53⅜	53¾	53⅜	.....	.....	3,021
Phil. & Reading	24¼	23⅝	25¼	24¼	24⅜	23⅜	23⅜	23	24	23	24⅜	23½	209 812
Tenn. C. & I.	27	26⅞	27¾	27¼	27¼	26¾	26¾	26	26½	26	26	25	8,5 0
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wheel. & L. E.	.....	.....	.....	.....	17⅜	17	17	.....	16	15½	17	16	2,360
do. pref	59	.....	59⅜	.....	.....	.....	59½	57	58	.....	58⅜	.....	750

Total shares sold, 416,481.

INDUSTRIAL AND TRUST STOCKS.

NAME OF STOCKS.	March 11. H.	March 11. L.	March 13. H.	March 13. L.	March 14. H.	March 14. L.	March 15. H.	March 15. L.	March 16. H.	March 16. L.	March 17. H.	March 17. L.	SALES.
Adams Express	.....	.....	.....	.....	175	.....	.....	.....	.....	.....	.....	.....	5
Am. Cotton Oil.	47⅛	46	47⅜	47¼	47	46¾	47¼	46¼	47¾	46¾	48	47⅛	30,732
do. pref.	79½	78½	79¾	78	79	.....	80	.....	80	79½	80	.....	895
Am. Dist. Tel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Express	.....	.....	.....	.....	.....	.....	117	.....	116	.....	.....	.....	107
Am. Sugar Ref.	110⅛	117¾	106¾	107¾	103¼	95¾	98½	92½	97¾	95½	99¼	96⅝	426,138
do. pref.	100	99½	98	97	96¾	9 ¾	96¾	94	96¾	95¾	96⅜	95⅜	6,136
Edison E. Ill. Co.	121	.....	121	.....	.....	.....	121½	120	121	.....	.....	.....	135
Edison Gen. El.	102¾	98	104½	100	103	101½	102¼	101¼	103⅜	100	102¼	100¼	67,457
Nat. Cord. Co.	58¾	58¼	60	58¼	59⅝	58⅝	59	58¾	58¾	57⅜	59½	58½	27,240
do. pref	107¾	.....	107	.....	106¾	.....	.....	.....	106	105¾	106¼	104½	2,239
do. New	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nat. Lead Co.	36¾	35	38¾	36⅝	37¼	36¾	37⅛	36	37⅜	36½	38⅝	37¼	28,35
do. pref	81	.....	83	81¾	81¼	80¼	80	78¼	80	79	82	80	12,112
Nat. Linseed Oil.	35½	35	37½	35	.....	.....	35	.....	35¼	34¾	35¾	35	2,110
So. Cotton Oil.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U. S. Express	.....	.....	66	.....	.....	.....	61	.....	.....	.....	.....	.....	40
U. S. Rubber	43¼	43	44½	.....	43	.....	42¾	42	42¾	42	42	.....	2,860
do. pref.	93¾	93½	95	.....	94	.....	93¾	93	.....	.....	.....	.....	600
Wells, Fargo Ex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western Union	95	93¾	94¾	94	94⅝	94⅜	94⅜	92⅝	93¾	92½	94⅛	93⅝	52,708

Total sales, 594,856.

CALIFORNIA.

San Francisco.

NAMES OF STOCKS.	CLOSING QUOTATIONS. Mar. 10	Mar. 11	Mar. 13	Mar. 14	Mar. 15	Mar. 16.
Alpha	.....	.....	.....	.....	.....	.....
Alta	.15	.15	.15	.15	.15	.15
Belcher	.90	1.00	1.05	.90	.90	.90
Belle Isle	.....	.....	.....	.....	.....	.....
B. & Belch	1.50	1.55	1.55	1.50	1.40	1.40
Bodie	.65	.....	.....	.....	.....	.25
Bulwer	.25	.25	.25	.20	.20	.15
Challar	.60	.60	.60	.60	.60	.55
Com'w'lth	.05	.05	.05	.05	.....	.05
Con. C. & V.	2 50	2 40	2.65	2 45	2.35	2.35
Con. Pac.	.....	.....	.....	.....	.....	.....
Crown Pt.	.40	.35	.35	.30	.30	.30
Del Monte	.....	.....	.....	.....	.....	.....
Ereka Con	.....	.....	.....	.....	.....	.....
G'ld & C'y	.75	.80	.75	.75	.70	.70
Hale & N.	1.15	1.15	1.20	1.15	1.0	1.05
M. White	.....	.....	.....	.....	.....	.....
Mexican	1.75	1.70	1.75	1.75	1.55	1.50
Mono	.....	.....	.....	.....	.05	.....
Mt. Diablo	.....	.....	.....	.....	.....	.....
Navajo	.....	.....	.....	.....	.....	.....
Nev. Qu'n.	.....	.....	.....	.....	.....	.....
N. B'lle Isle	.....	.....	.....	.....	.....	.....
N. Co'w'th	.....	.....	.....	.....	.....	.....
Ophir	1.95	1.90	2.00	1.90	1.75	1 85
Potosi	1.50	1.55	1.50	1.45	1.40	1.55
Savage	.70	.70	.70	.65	.65	.50
Sierra Nev	1.10	1.15	1.10	1.00	.90	.90
Uni'n Con	.90	.90	.90	.85	.80	.80
Utah	.10	.10	.10	.10	.10	.10
Yel. Jack	.45	.40	.30	.3	.35	.35

COLORADO.

Aspen. March 11.

	Bid.	Asked
Argentum Juniata	$0.65	$0.66
Aspen Contact	1.00	1.10
Aspen Deep Mining	.10	.11
Best Friend	.10	.12
Bi-Metallic	.12	.14
Bushwacker	.20	.23
Delia S.	1.90	2.00
Gold Valley Placer	.....	.15
Little Annie	.07	.10
Mollie Gibson	7.50	8.00
Pontiac	.10	.12
Smuggler	16 50	17.00
St. Joe & Mineral Farm	.11	.13
U. S. Paymaster	.....	.20

Colorado Springs. March 6.

	Bid.	Asked.
Anaconda Gold	.48	.19
Calumet	.08½	.09
Cleopatra	.11	.16
Fanny Rawlins	.20	.20½
Gold & Globe	.08	.09
Gold King	.18	.19
Isabella	.11	.15
Jack Pot	.02	.02
Jeff Davis	.02	.04
Lemhi	1.25	.....
Matoa	.05	.06
Ophir	.10¼	.11
Orphan Bell	.03½	.07
Pharmacist	.25	.27
Summit M. & M	.25	.27
Work	08	.09
World	.05½	.06

Denver.

Prices and sales for the week ending March 11th:

	High.	Low.	Sales.
Anaconda	$0.50	$0 45	8,600
Bangkok-Cora Belle	.03¼	.02½	9,700
Brownlow	.03¼	.03¼	5,000
Claudia J	.01	.01	10,000
Clay Co	.02	.02	300
Diamond B	.01½	.01¼	13,600
Gold Rock	.07¼	.07¼	700
Ironclad	.01	.03	1,200
Justice	.01¾	.01½	5,400
Orphan Boy	.02	.02	2,000
Puzzler	.08	.07	16,600
Tam O'Shanter	.01¼	.01	1,400
Work	.09¼	.08¼	58,400
Total sales			132,900

Rico. March 11.

Atlantic Cable Cons. M. Co	$0 25
Atlantic Cable guaranteed	.70
Enterprise Mining Co	3 50
Iron Dollar Silver Mines Co.	.25
Southern Cons. Treasury Stock	.20
Uncle Ned Co	.35

MARYLAND.

Baltimore. March 9.

COMPANY.	Bid.	Asked.
Balt. & N. C	.....	.10
Conrad Hill	.....	.02
Cons. Coal	.28	.30
George's Creek Coal.	1.00	1.07@1.08
Howard C. & C	1.10	.....
Lake Chrome	.....	.05
Silver Valley	.72@.80	.75@.80

MINNESOTA.

Duluth. March 10.

LISTED STOCK.

	Par.	Bid.	Asked
Biwabik M. Iron Co	100	30.00	33.00
Cincinnati Iron Co	25	1.15	1.20
Clark Iron Co	100	.50	.90
Cosmopolitan Iron Co	...	.50	.....
Great Northern Min. Co.	100	9 00	9.75
Kanawha Iron Co	100	1.75	1.75
Keystone Iron Co	...	.....	1.00
Lake Superior Iron Co	25	2 50	3.00
Lincoln Iron Co	...	.75	.....
Little Mesaba Iron Co	100	5.00	8.50
Mountain Iron Co	100	85.00	95.00
Minneapolis Iron Co	100	.15	.50
Mesaba Moun. Iron Co.	100	17.00	19.00
Shaw Iron Co	100	5.10	6.00
Security Land & Exp. Co.	10	20.00	35 00
Washington Iron Co	100	.25	1.00

UNLISTED STOCKS.

Allegheny Iron Co	10	.02½	.05
Aurora Iron Co	..	.....	.75
Buckeye Iron Co	100	.....	2.50
Chandler Iron Co	..	15.00	.....
Chicago Iron Co	100	1.00	1.25
Charlestoa Iron Co	100	1.65	2.00
Champion Iron Co	100	.15	.60
Comstock Iron Co	100	.10	.....
Columbia Iron Co	100	.....	2.75
Camden Iron Co	..	.....	1.50
Dayton Iron Co	100	.15	.....
Detroit Iron Co	25	.50	.....
Elmira Land & Iron Co	..	.25	.....
Great Western Mining Co.	100	4.60	5. 0
Horton Mining Co	10	.06	.....
Homestead Iron Co	25	.04¾	.08
Imp. Iron Mt. Mining Co.	..	.....	.50
Kentucky Iron Co	100	.15	.....
Kakina Iron Co	25	.....	2.00
Lackawanna Iron Co.	100	.80	.90
McCaskill Mining Co	..	.05	.08
McKinley Iron Co	100	.....	28.50
Mesaba Chief Iron Co	100	8.75	9.10
Mesaba Iron Co	..	.....	.85
Myrna Iron Co	10	.....	.25
Northern Light Iron Co	100	.10	.20
New England Iron Co	100	2.00	.....
Ohio Mining Co	100	8.00	10.00
Oneota Iron Co	100	.15	.50
Pennsylvania I. & S. Co.	100	.10	.40
Rouchleau Iron Co	100	.80	.85
Republic Iron Co	25	.55	.75
Red Hematite Iron Co	100	.05	2.
Standard Ore Co	25	.50	2.00
Towanda Iron Co	100	1.25	1.75
Zenith Iron Co	25	1.75	2.50

MISSOURI.

St. Louis. March 14.

Closing quotations:

	Bid.	Asked
Adams	.....	.97½
American & Nettie, Colo.	.27½	.32½
Bi-Metallic Mont	7.50	8 00
Elizabeth, Mont	.48¾	.50
Granite Mountain, Mont.	5.05	5.30
Hope	3.00	.....
Leo	.01	.....
Pat Murphy	.05	.....
Small Hopes	.80	.95

MONTANA.

Helena.

Prices for the week ending February 18th:

	High	Low.
Bald Butte (Mont.)	$2.50	$2.10
Benton Group (Neihart), Mont	.25	.20
Combination (Phillipsb'g), Mont	1.50	1 25
Cumberland (Castle), Mont	.25	.15
Elizabeth (Phillipsb'g), Mont	.15	.42½
Florence (Neihart)	.22½	.17½
Helena & Victor, Mont	.80	.65
Iron Mountain (Missoula), Mont	.82½	.75
Poorman (Cœur d'Alene), Idaho	.75	.60
Whitlach Union & MacIntyre	.50	.40

(Special report by F. M. DAVIS.)

PENNSYLVANIA.

Pittsburg. March 16.

	Bid.	Asked.
Bridgewater Gas Co	27.00	10.00
Chartiers Val. Gas	10 00	10.50
Enterprise Mining Co	.....	3.00
Hidalgo Mining Co	5,50	6.50
La Noria Mining Co	.10	.....
Master Mining Co	8.50	9.50
Manufacturers' Gas	.....	30.00
N. Y. & Clev. G. D	51.00	51 50
Pennsylvania Gas	.....	10.25
People's N. G. & P. Co.	14.88	.....
Philadelphia Co	21.75	21.88
South Side Gas	.....	26.00
Tuna Oil	.....	20 00
Wheeling Gas Co	21.63	22.00
W'house Air Brake Co	.....	110.00

Philadelphia. March 16.

	Bid.	Asked.
Bloomington C. & C	.....	.....
Buck Mountain C	.....	.....
Cambria	71½	.....
Connellsville Gas Co	.....	.....
Excelsior B. & S	.....	.....
Locust Mt. C. & I	.....	.....
Penn. Salt	101½	.....
Penn. Steel	123	.....
Penn. Gas Coal	.....	.....
Royal Gas	.....	.....
Westmoreland C	70	.....

SOUTH DAKOTA.

Deadwood. Mar. 2.

	Bid.	Asked.
Deadwood Terra	$1 50	$1.75
Double Standard	.22	.25
Golden Reward	1.10	1.50
Hawkeye	.62	.65
Iron Hill	.12½	.15
Isadora	.25	.30
Mutual	.01¼	.01¾
Ruby Bell	.22	.25
Seg. Iron Hill	.01	.01½
Tornado	.25	.30

Pipe Line Certificates.

Week Ending March 17.

	High.	Low.	Sales.
Mar. 11	.....	.....	.....
" 13	.....	.....	.....
" 14	.....	.....	.....
" 15	.....	.....	.....
" 16	.....	.....	.....
" 17	61¼	61	5,000
Total sales in barrels			5,000

FOREIGN QUOTATIONS.

London. March 8.

	Highest.	Lowest.
Alaska Treadwell	£2¼	£2
Amador, Cal	1s. 3d.	9d.
American Belle, Colo.	2s.	1s. 6d.
Can. Phosphate, Can.	£½	£¼
Colorado, Colo	£⅛	.....
De Lamar, Idaho	£1 7-16	£1 5-16
Dickens Custer, Idaho.	7½d.	4½d.
Eagle Hawk	.....	.....
Elkhorn, Mont	£1⅜	£1¼
Eberhardt, Nev	£⅛	.....
Emma, Utah	9d.	3d.
Esmeralda, Nev	.....	.....
Flagstaff, Utah	10½gs.	7½gs.
Golden Leaf, Mont	.....	.....
Jay Hawk, Mont	8s 6d.	7s. 6d.
La Luz, Mex	1s.	6d.
La Plata, Colo	1s. 3d.	9d.
Maid of Erin, Colo	£½	£⅜
Mammoth Gold, Ariz.	1s. 9d.	1s. 3d.
Montana, Mont	3s. 6d.	2s. 6d.
Mount McClellan	1s.	3s.
New Consolidated	.....	.....
New Guston, Colo	11s.	13s.
New Hoover Hill, N.C.	2s. 6d.	...
New Russell, N. C	.....	.....
New Viola, Idaho	.....	.....
Old Lout, Colo	.....	.....
Parker Gold, N. C	.....	.....
Pittsburg Cons., Nev	2s. 6d.	1s. 6d.
Plumas Eureka, Cal	11s	9s.
Poorman, Idaho	7s. 9d.	7s. 3d.
Richmond Con., Nev.	£9-16	£7-16
Ruby, Nev	6d.	3d.
Sierra Buttes, Cal	6s.	4s.
" Plumas Eur., Cal.	£9-16	£7-16
Silver King	.....	.....
United Mexican, Mex.	2s. 6d.	1s. 6d.
Yankee Girl, Colo	2s.	1s. 6d.

Paris. March 2.

	Francs.
Belmez, Spain	660.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	648.50
Lexington, Mont	95.90
" parts	2.25
Nickel, New Caledonia	750.00
Rio Tinto, Spain	392.50
" " oblig	517.00
" " 2d	512.50
Tharsis, Spain	117 00
Vieille-Montagne, Belgium	520.00

ASSESSMENTS.

COMPANY.	No.	D'l'nqt in office.	Day of sale.	Amt. per sh're.
Anchor, Utah	17	Mar. 27	April 17	.20
Belcher, Nev	15	Mar. 11	April 4	.50
Bodie, Cal	15	Mar. 16	Apr. 17	.25
Caledonia, Nev.	15	Mar. 2	Mar. 23	.10
Challenge, Nev.	11	Mar. 16	Apr. 17	.25
Con. St. Gothard, Cal	7	Mar. 17	May 6	.05
Dalton, Utah	...	Mar. 1	Mar. 22	.10
Exchequer, Nev.	35	Mar. 3	Mar 28	.05
El Dorado, Mex.	2	Mar. 6	Mar. 29	.05
Greeley, Utah	....	April 5	.....	.01
Himalaya, Ut'h	12	Mar. 24	April 17	.00½
Mono, Cal	33	Mar. 25	Apr. 4	.25
Morgan, Cal	16	Mar. 6	Mar. 30	.10
Muldoon, Utah	....	April 10	April 25	.01
N. Belle Isle, Nev	22	Mar. 3	Apr. 3	.10
Overman, Nev.	66	Feb. 14	Mar. 30	.25
Peer, Ariz	14	Feb. 20	Mar. 22	.05
Peerless	15	Feb. 20	Mar. 21	.05
Silver Hill, Nev	32	Mar. 21	Apr. 11	.05
Teresa, Mex	10	April 1	April 19	10
Tintic, Utah	1	Feb. 20	April 17	.00½