THE ENGINEERING AND MINING JOURNAL

COAL

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

VOL. XLVIII. NOVEMBER 30. No. 22.

RICHARD P. ROTHWELL, C.E, M.E. } Editors.
ROSSITER W. RAYMOND, Ph.D., M.E. }

Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

Books for review and all communications for the JOURNAL should be addressed Managing Editor, P. O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P. O. Box 1465, New York. Articles written by Mr. Raymond will be signed thus *; and only for articles so signed is he responsible.

London Office: Finsbury Chambers, 76 Finsbury Pavement, London, E. C. Mr. Thomas B. Provis, Civil and Mining Engineer, Manager.

Mexico: Mr. R. E. Chism, M. E., Callejon Espirito Santo No. 4, City of Mexico.

Peru, South America: Mr. John Newton, No. 2 Calle Constitucion, Calla.

Australasia: Messrs. Moffat, Judd & Co., 11 Bridge street, Sydney, N. S. W.; Mr. W. Forster, 56 Elizabeth street, Melbourne, Victoria; Messrs. J. T. Partridge & Co., 134 Manchester street, Christchurch, New Zealand.

SUBSCRIPTION PRICE, including postage:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5.

Monthly Export Edition, all countries, $2.50 gold value per annum.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

FILE COVERS will be sent by mail for $1.00, or delivered at office for 75 cents each.

THE SCIENTIFIC PUBLISHING CO., Publishers,

SOPHIA BRAEUNLICH, Sec'y & Treas. R. P. ROTHWELL, Pres & Gen'l Manager

P.O. Box 1833. 27 Park Place, New York.

The Table of Contents will be found at the end of the reading matter, page 487.

ONE of the most amusing things in the mechanical engineering line that we have come across lately is the ERWIN hydraulic engine. The inventor takes a duplex direct-acting pump like the WORTHINGTON, and causes it to pump water into a turbine wheel, which is mounted directly above the pump. The water is used over and over. A hundred revolutions of the driving wheel may be produced with a single movement of the piston. The crank is dispensed with, "and the great loss of power, amounting to about 33 per cent., unavoidably incident to the use of the crank," (so the circular says) is avoided. Probably an inventor who persists in believing the old fallacy of the inefficiency of the crank is capable of inventing any absurd combination to avoid its supposed defects, but there are few worse combinations possible than a non-expansive direct-acting steam pump and a water wheel, which rarely has an efficiency of 80 per cent.

THE lavish distribution of medals and other awards at the late Paris Exposition, about two-thirds of the exhibitors being distinguished in this manner, detracts very much from the value of such distinction. A sensible suggestion on this subject has been made in reference to the electrical exhibition to be held in Edinburgh, Scotland, next year, viz., that in place of awards a certificate of efficiency should be given for those exhibits which come up to a certain standard.

This suggestion is also worthy the attention of the committee in charge of the arrangements for our own World's Fair of 1892. In addition to the objection already mentioned the system of awards by a jury is often unsatisfactory in its operation, for it is nearly impossible in the short time at the disposal of the jurors, and in the absence of competitive tests, to form a just decision on the merits of an exhibit. Let each exhibitor make certain claims, or let a standard of excellence be established, and it will be much simpler and more satisfactory for the judges to decide whether the claims are made good, or that the exhibit reaches the standard of excellence fixed upon.

IN a recent interview with Lord CRAWFORD, the chairman of the London Electric Supply Corporation, published in the *Pall Mall Gazette*, many interesting details, supplementary of what we have already described in these pages, November 10th, 1888, and subsequently; of the gigantic electric lighting system in London, are given. The boiler power already installed is 14,000 horse power. The difficulties in manufacture of the dynamos, on account of their size, were only overcome by the construction of special tools and undertaking the manufacture themselves. They tried both KRUPP in Germany and the Creuzot Works in France, but neither would contract to deliver under three years. The lathe required to turn the main shaft is of the same dimensions as that used for turning the 100-ton gun at Woolwich. The shafts are 36 inches in diameter, and in the rough weighed each 70 tons. They were the largest castings of steel ever made in Scotland.

As we have already mentioned, these dynamos are of 10,000 horse power, each being driven by two engines of 5,000-horse-power each. The energy and self-reliance of this corporation, owing, no doubt, in a great measure to the ability and courage of the chief e ngineer, Mr. FERRANTI, are an example and a shining light, and worthy of imitation when more than ordinary difficulty is met with in carrying cut the plans of an able engineer; but it is a somewhat dangerous experiment, as it is rare that the business and manufacturing knowledge necessary are at the disposal of the same concern. As a further illustration of the fertility of resource in the present instance, in place of giving out a contract for the manufacture of the electric conductors, they preferred to make them themselves, as the system is altogether novel. The conductors, consist of two concentric tubes of copper, which are being manufactured in 20-foot lengths. The smaller tube, having about ½ of an inch sectional area, conveys the current from the generating station, and is covered with insulating material, while a second copper tube compressed round this serves for the return current. This latter is also insulated, and outside of all there is an ¼-inch wrought-iron tube made tight for protection against mechanical injury.

THE DANGERS FROM ELECTRIC WIRES AND FIRE-PROOF BUILDINGS IN BOSTON.

The terrible fire which yesterday (28th November) again destroyed a large part of Boston is said to have been occasioned by an electric light wire coming in contact with one of the Electric Time Company's wires. This disaster may be expected to hasten the burying of the wires and the adoption of a more perfect insulation for them, so that accidents of this character may hereafter be rendered impossible.

The risks from high tension electric currents are so great that the promiscuous stretching their conductors through our streets and across our houses should be put an end to. We are not, however, unmindful of the difficulties attending the obtaining of such a perfect insulation for the wires as will render them harmless underground.

The whole question is one of great difficulty and not to be decided offhand by cranks and quacks.

The advantages of electric lighting and the electric transmission of power are so great that men are willing to take enormous risks to secure them; but we are now being taught, through the expensive lessons of experience, that the risks assumed are too great, and that the effective insulation of high-tension current wires is the first object to attain. The prize awaiting the fortunate inventor of such an insulation will no doubt soon find something that will render such wires as free from danger as steam pipes now are.

The fact is a startling one to contemplate, that the fire which has swept out of existence a considerable number of the business houses of Boston originated and extended itself in the buildings which we have been told were "absolutely fire-proof." Evidently much greater attention must be given to the subject of rendering buildings incombustible than it has yet received, and the use of material that will attain this object must become much more general than is now the case.

It is no secret that wood and most other combustible substances can be rendered incombustible, and the authorities in all large cities should provide such stringent regulations requiring the use of only such materials in certain classes of buildings as would render the spread of a fire impossible. It is not necessary to advocate any particular process, but to frame regulations which must be complied with by those building, and which would secure immunity from these terribly destructive conflagrations.

THE FALES FURNACE.

Our attention has been at various times called to the wonderful claims made for the Fales furnace exhibited in Philadelphia, and from the first, owing to the mass of rubbish written about it to account for the marvels exhibited, such as new gases, burning the air, etc., we were disbelievers as to the device having any merit at all. We ascertained that efforts had been made to have the invention examined and reported on by a committee appointed by the Franklin Institute, but the inventor and the committee were unable to agree upon the terms of a practical test. Subsequently we learned that the principle of the invention had been applied to a boiler furnace in the neighborhood of Philadelphia without successful result, the failure being explained by the advocates of the furnace apparently to their own satisfaction, as arising from imperfect proportions or something of the kind. Now, however, the value of the invention, or rather its want of value, has been conclusively shown by a competitive trial with an ordinary heating stove made by the Abram Cox Stove Company, of Philadelphia. The conditions were as nearly similar as possible, the sole difference of importance being that of the grates, which, in the case of the Fales, is the mysterious agent that produces such marvelous results. The grates were charged with anthracite coal, with a little bituminous on the top to assist in kindling, and both furnaces were

lighted from the top. The Abram Cox furnace roared in exactly the same strange fashion as the Fales, and exhibited the same phenomenon of melting iron in a few minutes near the edge, while a piece of wood in the centre of the furnace was only charred in the same period of time. In a thirty-three hours' test, at the end of which time it was impossible to keep the fire alight in the Fales furnace (though the claim is that it would burn all winter), the consumption of coal was 348 pounds, while in the Abram Cox furnace it was 384 pounds. The actual result in heat given out showed that the Fales furnace gave an increase of 1·2356 degree Fahrenheit on the normal temperature, and the other an increase of 1·6927 degree per pound of coal consumed, the latter thus proving itself 37 per cent. better than the Fales as a heat generator. Given appropriate conditions, the same grate of the Abram Cox Company can doubtless make a considerably better showing.

Thus are the pretensions of the Fales Furnace Company, which was to revolutionize the iron and every other industry of the world, settled once for all as unfounded, and it affords once again the lesson that it is always safe to look with suspicion upon any process or invention which is accompanied by mystery and which revolutionizes science.

AN AMERICAN ACADEMY OF ENGINEERING.

Last week we published a set of resolutions passed at the meeting of the American Society of Mechanical Engineers, on the proposition of its retiring president, Mr. HENRY R. TOWNE, which expressed the desirability of forming a new society of American Engineers, broader and more comprehensive than any of the existing societies. In this resolution the council was requested to appoint a committee of conference to meet similar committees of the other national societies and discuss with them the subject of the proposed new society, and to report the result of their labors at the next meeting of the Mechanical Engineers' Society. At the council meeting on Friday such a conference committee was appointed, with Mr. TOWNE as its chairman.

The action thus taken is the first actual step which has been made in furtherance of an idea that has for several years been informally discussed among many of our most prominent engineers. It was a favorite idea of the late ALEXANDER L. HOLLEY, as was stated in the discussion of the resolutions passed last week, but it has received its greatest impetus during the past summer in the joint excursion to Europe of members of the civil, mining, mechanical and electrical engineers. It was a frequent subject of discussion among the excursionists, and Prof. THURSTON made a public reference to it in his address in the hall of the Institution of Civil Engineers in London in response to the address of welcome by that institution.

The idea has not as yet crystallized into any definite scheme, and in various minds it has taken many different forms. Some have favored the consolidation of the four societies into one grand society. Members of the Civil Engineers' Society have thought that their society, being in a sense the parent of all the others might, in some manner take them under its wing, and overtures have been made looking to the formation of the several local societies throughout the country into chapters of the older society. Some members of the Mechanical Engineers' Society have stated that as mechanical engineering is the foundation of all engineering, including civil, electrical, sanitary, military and naval engineering, their society should be the grand society, but as it is younger and smaller than either the civil or the mining engineers' societies this plan would meet with great opposition. The most approved scheme appears to be the organization of a new society, as outlined in the resolutions referred to, which shall be composed of selected members of the existing societies and be in some manner representative of these societies.

Mr. WILLIAM KENT read a paper at the Buffalo meeting of the American Association for Advancement of Science, before the section of Mechanical Science and Engineering, in August, 1886, in which he proposed an American academy of engineering. As this paper not only gives a summary of reasons why such an academy is desirable, but gives the outline of a plan for its organization, we refer to it here, and shall republish it at an early day. Without at present expressing an opinion either as to the desirability of the proposed academy or as to the feasibility of the particular scheme proposed, we commend Mr. KENT's paper to the attention of our readers. We will be glad to receive other contributions on this subject, either for or against, and trust that the full discussion of it will lead to some benefit to the profession at large.

QUICKSILVER MINING.

A paragraph, curious for its ignorance, has lately been going the round of the English papers to the effect that

> "The increased demand for quicksilver for mining purposes and in connection with gold production has caused the recent rise in the price of this article. It is stated that the New Almaden mines in California are about to amalgamate in consequence, with a view to the increasing of their outputs. They have only been partially worked in the past, and the low-grade ore has been thrown on one side. It will now be worked by modern appliances."

Any one acquainted in the slightest degree with the condition of the quicksilver industry in California and with the wonderful economy with which the New Almaden company mines and treats its low-grade ores will at once recognize how ridiculously incorrect such a statement is. The New Almaden company produces nearly all the quicksilver in this country, as a reference to the reports published in these columns will show.

Curiously enough, on the heels of the absurd statement above referred to comes the prospectus and launching of a company in London, with a capital of $2,250,000, to work the New Idria & Picacho quicksilver mines in California and "large and valuable deposits of chrome iron ore."

One of the objects of this company, no doubt, is philanthropically to to instruct the poor, benighted administration of the New Almaden mines how to treat the low-grade ores to better advantage, and, judging from the prospectus, this treatment is to be effected by an entirely new method hitherto unknown in the history of quicksilver treatment, namely, by *smelting* the ore; the credit for which, it is only fair to state, is given to the New Almaden company in its recently improved furnaces. We need scarcely say that the practice of "smelting" cinnabar ores at the New Almaden works exists only in the fertile brains of the framers of the prospectus. That such blunders should be made by the directors of the new company, who, as far as we can learn, have no knowledge whatever of quicksilver mining and treatment, is not to be wondered at, but we are almost astonished that Messrs. Bainbridge, Seymour & Co., who are advertised as the consulting engineers of the company, should allow such ridiculous statements to appear on the same prospectus with their names.

The price to be paid for these three "valuable" properties, including the plant at the works in New York, whatever they may be, is $1,900,000, leaving for working capital $350,000, the judicious expenditure of which is beautifully figured out to produce on paper an annual profit of $1,590,000; and "even this handsome profit might be materially increased by more extensive developments and plant."

The New Idria mine is well known, and in its earlier days, from 1866 to 1877, was a considerable producer, its production of quicksilver ranging from 6,316 in the last-named year to 12,180 flasks in 1868; but since then it has gradually fallen off to a production of 1,320 flasks last year. This is scarcely a sound basis for a business represented by $2,250,000; nor does it at all justify the purchase price of $1,900,000, for we need scarcely take into account the chrome iron property, as that only figures in the prospective profits for a paltry $90,000 a year; though the total consumption of the United States in 1888 was only 1,500 tons, valued at $20,000. The statement put forward, we suppose as evidence of the value of the property, that "over $2,000,000 have been expended in opening and improving the mine, on explorations, construction of roads, buildings, sheds, machinery, furnaces, etc.," is anything but a recommendation, as if with this liberal expenditure the undertaking is now in a non-paying condition, it is in the highest degree improbable that a further expenditure of some $300,000 is to put the undertaking on a profitable basis, much less enable it to produce 75,000 flasks of quicksilver per annum. The average price of quicksilver in London for the last six years has been about £6 18s., and the annual average world's production for the last five years has been 101,395 flasks, divided into 69,200 flasks foreign and 32,195 flasks Californian. On December 31st, 1888, the estimated stock in London was about 49,000 flasks as against 38,000 at the end of 1887, thus showing that the present production is more than sufficient for the world's needs. How would it be with an addition of nearly 74,000 flasks, or more than 70 per cent. increase on the present production? A reduction in price to even below the cost of production would not stimulate consumption so as to absorb anything like the proposed output. These statistics, and in general the commercial aspect of the case, seem to have been entirely overlooked by the projectors of this enterprise; but we trust that they will be brought to the attention of the public in time to save them from making an investment which must necessarily prove disastrous.

The estimate upon which the whole fabric of profit is based is a return of "*only 4 per cent. of quicksilver in the ore*" (the italics are ours), while from the 28,861 tons of ore reduced by the New Almaden company in the past year the production of quicksilver was 2·014 per cent., while by far the larger portion of this ore gave much less than 2 per cent., and the net earnings from the operation of this admirably conducted concern (the New Almaden Company) for the past year was $131,623, and it is, therefore, simply preposterous to suppose that, with the admittedly largest and richest deposits of cinnabar in California, the greatest skill and experience in the industry, and ample capital, this profit can be increased in an inferior property to $1,500,000 simply by the magic touch of people inexperienced in the business. We will conclude by quoting an extract from an excellent paper by Mr. J. B. Randol, general manager of the New Almaden company, and, no doubt, the highest authority on the subject in the world, written for the ENGINEERING AND MINING JOURNAL March 2d, 1888. He says: "No quicksilver mines were opened, nor were any discoveries reported of new cinnabar deposits of sufficient importance to repay the outlay for their working. The rumors of 'finds' were abundant, as usual, but none could bear investigation, and it is to be greatly feared

that California will not have any new mines to be worked, while it is too certain that the quicksilver mines of to-day are unable to arrest the steady decline in their production."

We need only add that, while we are always pleased to see foreign capital come to this country and engage in the development of our mineral resources, and while we know that very large profits can be earned on investments in mining when made with that care and prudence that are essential to success in other classes of investment, yet we feel it our duty to warn investors against putting their money in enterprises that cannot fail to prove unprofitable and that can only tend to bring mining investments into disfavor.

ECONOMIES IN RAILWAY PRACTICE.

Competition and the general needs of the community in demanding lower rates of freight as a stimulus to development of business have had an irresistible influence in reducing railroad freights to a very low figure, and although there are periodical spasmodic attempts on the part of the railroads to secure better terms, at one time by some combination or pooling of traffic, at another by taking advantage of the season of the year and the forced withdrawal of water competition, yet the tendency is always toward a reduction in place of an increase in rates. This very reduction of rates, leading to an enormous business, reduced the working expenses on each ton hauled, but it seems as if on the present lines of operating further economy were now well-nigh impossible.

It is, therefore, time for the railroads to exert themselves in other directions, and to adopt measures by which new economies can be realized.

Apparently we are on the eve of seeing some important departures from accepted practice in railroading which are likely to lead to satisfactory results to the stockholders. In the first place, we have the Pennsylvania and the Baltimore & Ohio roads giving a fair trial to the compound locomotive system, which, from the evidence which we have recorded from time to time in the ENGINEERING AND MINING JOURNAL, promises to effect a saving in the fuel consumed of from 15 to 19 per cent. A recent letter to the *Railroad Gazette* from the officers of the Royal Saxon State Railroads, where the system of compounding has been in use since 1885, states that the economy in fuel consumption is about 20 per cent. This would be a substantial gain, even for our Eastern lines, favorably situated as they are for obtaining cheap fuel, but for some of the Western roads, the Southern Pacific for example, which, in addition to the cost of its coal, has to haul its fuel supply to depots along the line more than 2,000 miles, the saving would be proportionately greater.

The cost of fuel to the New York Central last year amounted to $2,228,225, being nearly 10 per cent. of the total expenses of the company, and a saving of 20 per cent. on this item would have provided one-half per cent. more for dividend, and would have added more than 4¼ per cent. to the net earnings. On many roads this saving would bear, as we have said, a much larger proportion to the net earnings.

The next point which is under serious consideration and trial by railroad managers is greater economy in maintenance of track, and this they are trying to obtain by borrowing again from abroad, where the conclusions arrived at, after thorough trial, are favorable to the adoption of metal ties in place of wooden ones. The evidence laid before the recent Railroad Congress in Paris pointed clearly to the economy to be gained by the use of metal ties.

In Switzerland metal ties have been in service a sufficient length of time to give some reliable evidence of their value as compared with wood. They were there subjected to severe tests of climate, gradient and curves. The report from Mr. Mayer, the chief engineer of the Western Railroad of Switzerland and the Simplon Railroad, was, that since 1883 metal ties had been used for a considerable portion of the renewals on all sections of the roads in his charge, the total length now in use being more than 68 miles, representing 126,990 ties in track, and that all renewals are now made with them in consequence of the satisfactory service they had given. Of the number laid down since 1883, only 43 ties had been taken out for breakage or other causes. It is impossible yet to say what would be their duration, as the first laid down show no deterioration; but out of the same number of oak ties under similar conditions of time and traffic they already had had to replace between 20,000 and 25,000. It was found sufficient to space them three feet from center to center. The gradients are as high as 2·3 per cent., while the traffic amounts to thirty trains a day in each direction, and the maximum weight of the engines is six tons per wheel, and maximum speed forty miles an hour. The experience of the company is that there is a notable decrease of ordinary road maintenance cost after the second year with the metal tie. On this point another Swiss company stated that on a section of 12·9 miles laid with metal ties against the same length of section laid with new wooden ties, the cost of maintenance (not renewal) was for the third year $869, against $1,563, or about 45 per cent. From all the Swiss railroads the verdict was in favor of metal ties.

Herr Brauns, at the recent meeting of German metallurgists at Düsseldorf, stated that on the Prussian railways alone 1,668,179 metal ties have been laid since 1886. This action has been taken after long-continued tests.

The Mexican Railway Company also after extended experience has adopted a steel tie as the standard, and at the end of June of this year had laid 77 miles of road with them. The engineer of the road states that the track laid with them is exceptionally good, while it is maintained at much less cost than before.

Of course, it is impossible to compare the cost of maintenance of track in one country with that in another; but to take the Pennsylvania Railroad Company, for example, we find an expenditure last year of $6,819,590 for maintenance of way on 2,369 miles of road operated, or nearly $2,900 a mile. A saving of 29 per cent. of this would provide two per cent. extra dividend on the Pennsylvania Railroad Company's share capital. Of course, metal are more expensive than wooden ties, but air brakes are more expensive than the old hand brakes that are so rapidly disappearing. The wooden tie will certainly go also.

It is satisfactory to note that at least three important railroad companies—the Pennsylvania, the New York Central, and the Chicago & Western Indiana—are making serious tests of this improvement on the hitherto accepted type of permanent way, and that at a very early date we may expect one of the forms of metal tie now under experiment to be adopted as the standard for all renewals.

The application of anti-friction journal bearings to rolling stock of railroads, if practicable, means an important economy of tractive power. And this problem seems to be approaching a solution, as an anti-friction journal bearing has been applied to a car on the New York & New England Railroad, and commenced running January 26th of this year, and has now run over 45,000 miles without lubrication. It is now running 381 miles daily on the Washington fast express. A dynamometer test of this car, after running more than seven months, against similar ones with ordinary bearings, showed a saving of power of more than 60 per cent. This looks like a practical solution of the question; but we must not jump to the conclusion that even if the bearing actually realizes this economy of effort in starting a car, the tractive resistance of a train furnished with such bearings at full speed will be reduced in the same proportion. The benefit to be derived from this improvement will be most notice- able in the short service trains with frequent stops.

This last device has been the dream of inventors for many years, and numerous are the schemes patented to accomplish the end; but self-destruction and consequent getting out of true have been the defects in the past. This description of bearing presents important advantages for mining cars, and we shall shortly publish an interesting summary of friction tests made recently on the Susquehanna Coal Company's mine cars.

NEW PUBLICATIONS.

CHEMICAL TECHNOLOGY: OR CHEMISTRY IN ITS APPLICATIONS TO ARTS AND MANUFACTURES. Edited by CHARLES EDWARD GROVES and WILLIAM THORP. Vol. I.—FUEL AND ITS APPLICATIONS by E. J. MILLS and F. J. ROWAN. Published by P. Blakiston, Son & Co., Philadelphia, 1889. Cloth, royal octavo, xx. + 802 pp.; 7 plates and 607 other illustrations. Price $7.50.

This volume, "Fuel and its Applications," is the first of a new edition of "Chemical Technology," founded on that written by Richardson and Ronalds and revised by Richardson and Watts. The original basis was the German technology of Dr. Knapp, and hence the former English editions are often familiarly known as "Knapp's Technology." The new series is being prepared and issued in the endeavor to bring the subject matter more nearly up to date. This is by no means an easy task, in view of the enormous strides which have been made in chemical technology since the earlier editions were issued. The authors appear to realize the difficulty of their undertaking when they say: "The law of progress, to which all industrial processes are subject, however, causes any work on technology to become out of date in a few years, and this applies in a special manner to the very large class of operations which are closely connected with chemistry. For nowhere has the extraordinary activity in all departments of knowledge which has been witnessed during the last thirty years been more marked than in the domain of chemistry, and this has necessarily borne fruit, not only in the modification of old methods, but also in the invention of new processes, and in the introduction of more perfect methods of research."

This first volume treats of fuel and its applications generally, its special employment in chemical manufactures being reserved for detailed consideration in the volumes to follow. Even with this limitation the scope of the work is so vast that many of the subdivisions receive but scant attention. This is unavoidable, if it is attempted to cover so much ground in the limits of a single volume; but perhaps better balance might have been secured. For example, wood fuel is disposed of in nine pages, out of the 802 pages which make up the book; peat receives ten pages; coal naturally calls for more attention, and is discussed in 65 pages. The bulk of the book is made up of descriptions of modern means of heating, as in vaporization and distillation, and the various furnaces. As the work is one of a series on chemical technology, it is eminently proper that fuel should be considered mainly in its relation to the chemical industries, and since the object is to describe recent practice rather than obsolete methods, or give material which can be obtained elsewhere, the authors do well to devote a large portion of the space in the manner chosen. Yet it is a little disappointing to find, in an American edition of a technical work of this character, that natural gas, of which we are in-

formed that "considerable quantities" have been discovered in America, should be passed over with a notice occupying but seven and one-third pages, and that by no means consisting of very recent information. The literature of natural gas, easily accessible, is large, and it would have been easy to at least carry on the statistics to, say, a year before publication of the volume. Artificial gaseous fuels receive much more attention, and the furnaces in which they are used are described in considerable detail.

Taken altogether, the work is a creditable and a useful one. It is an easy matter to find flaws in it, as in most other similar compilations; but the deficiencies are the inevitable result of attempting to treat in a single volume a subject so vast and ramifying into so many diverse branches. The book will be very useful for reference, and should be of especial value to the inventors and experimenters or users of processes or appliances for the combustion of fuels, since in it can be found a record of a large part of the methods heretofore proposed and adopted. Where critical remarks are made, they appear to be judicious. The illustrations are very numerous and are well selected. An immense amount of information has been crowded into these closely printed 802 pages; and, whatever may be the deficiencies or omissions, the book will undoubtedly be well received.

The titles of the forthcoming volumes of the series are announced as follows: Lighting; Acids and Alkalies; Glass and Pottery; Metallurgy; Textile Fabrics; Leather, Paper, etc.; Coloring Matters and Dyes; Oils and Varnishes; Brewing and Distilling; Sugar, Starch, Flour, etc.

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

Libraries, Etc., for Workingmen.

EDITOR ENGINEERING AND MINING JOURNAL:

In reply to the request of "Manufacturer" in the ENGINEERING AND MINING JOURNAL of 9th inst., I think that he could gain some valuable information on the subject from some of the officials at Saltaire, Yorkshire, England. There is located the finest institution and system of the kind in England, founded by that eminent philanthropist, Sir Titus Salt. I had a small brochure description of the place and its surroundings, but in my travels around this country I have lost it. However, I feel sure it would repay "Manufacturer" to make inquiries at Saltaire.

R. H. NORTON.

OREGON PACIFIC RAILROAD CO., CORVALLIS, Ore., Nov. 21, 1889.

Leaching Silver Ore in Honduras.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In considering the applicability of leaching to the ores at this place, it occurs to me that I have suggested in a former communication, either to the JOURNAL or to the *Mining and Scientific Press*, that the treatment of a calcareous roasted ore, containing caustic lime, with cuprous hypo, for the purpose of neutralizing the caustic, is an error for the reason that caustic lime does not precipitate copper from that solution, hence is not neutralized thereby. In the presence of lead sulphate, however, the caustic will be neutralized because the lead sulphate will dissolve in the extra solution, the caustic lime (or caustic soda produced by it) will precipitate insoluble lead hydroxide, and will be neutralized.

If this is correct, it follows, firstly, that plain hypo will answer as well as extra solution for this particular purpose, and, secondly, that the leaching solution cannot become caustic when treating a leady ore if the lead be present in sufficient quantity. Zinc will have the same effect if enough of it should remain in the ore in soluble form after the washing, which will, however, only be the case with crusts or lumpy ore, unless the roasting is defective, when blende will dissolve precipitating silver from ordinary, or copper from extra, solution. In other cases it seems as though a treatment of the alkaline roasted ore with acid, sodium disulphate or a solution of bluestone would be the right thing.

In assay office tests of roasted calcareous ore, it will not do to judge hastily as to the character of the first-wash water. The lime in these ores sometimes requires a considerable length of time to slack, and on simply washing on a filter the water remains neutral, while if the ore be soaked for an hour or two, as would occur on the large scale of working, it becomes alkaline.

Sometimes the ores we are treating show signs of cementing when wet, which is ascribed to the presence of calcium sulphate; this is an important feature to be investigated in view of the possible adoption of the leaching process, which I feel much disposed to recommend in preference to amalgamation, and I think a Stetefeldt furnace would be suitable for the roasting, though I have not yet decided that point.

The prevailing characteristics of the ores are zinc-blende, and galena (sometimes antimonial), with very small proportions of pyrites in a calcareous gangue, a combination which all metallurgists will admit is not favorable to a high percentage of extraction by amalgamation. A large or considerable part of the soluble silver in the roasted ore is not chloride, yet all that is soluble is extracted in the pans. But the Russell process will probably extract more, especially when the roasting is imperfect, on account of its power to decompose blende, for the blende in these ores is argentiferous. In like manner we can sometimes get better results in the pans by the use of a little bluestone *at the proper stage of the work*.

Russell's extra-solution has this advantage over bluestone and salt, that it is not decomposed by either caustic lime or calcium carbonate, but remains intact to do its work in the presence of these substances, while the caustic lime, as already pointed out, is quickly neutralized in presence of lead sulphate. I expect soon to make a series of experiments in leaching these ores.

I have here met with an illustration of the manner in which erroneous ideas may be conceived and propagated. I was told there was a large stock of nitre on hand which had been sent for use in the pans. Requiring some nitre in the assay office, I went to the storeroom to get some, and found a number of boxes of *nitre cake!* In working these ores it is very possible some benefit may have been derived from the use of nitre cake; in fact I have used some myself, and doubtless some of my predecessors who also used it are now enthusiastic advocates of the use of nitre in the pans.

The experience of this company is a good illustration of two points on which I have often expatiated, that, before putting up works, and after ascertaining the existence of a sufficient quantity of pay-ore, they should employ a competent metallurgist to tell them what kind of works they require, and to run those works when erected. Instead of this, they send a couple of small lots of picked ore to some metallurgical works in a city, get reports on their treatment, and rush off to a foundry to order a mill of a certain daily capacity. The mill is built by some one who is not familiar with the smaller details of milling, even if he knows a little about the matter, who usually takes his cue from some other works that he has seen or superintended, and then they employ a "mill foreman" of the muscular class to go and run the mill. The next thing in order is to bellow for bullion.

Over a year ago I heard of a company in Honduras who wanted a man to take charge of a mill, and I made inquiry about it. I was told that they didn't want a man of my kind, but a common millman at about $150 per month. That company has had several common millmen, paying them, or some of them, as much as I should then have asked, and the result is that they have spent more money without corresponding benefit than would have enabled them to employ the best metallurgical talent, and their mill is badly planned, badly constructed and has been so badly managed that it is almost a wreck.

The miner should come first, the metallurgist next, the mechanic following; but in the forcible language of a friend of mine, "God bless them! (you know what I mean) they get a *blacksmith* to build a mill and then ask a metallurgist to work with it;" that is, when they don't employ a "common millman," who they imagine is "a practical man." I believe some people think a man who *writes* cannot *work*.

This state of affairs is partly due to the "blacksmiths" (or foundrymen) pretending to know all about metallurgy in many cases. Of course they recommend those machines off which they can make the most money.

But it is not only in the choice of a process, but also in the arrangement of the works, that the knowledge and experience of a genuine metallurgist is required. Every case has its peculiar conditions, more or less. For instance here, if the ore is to be crushed with salt, it is necessary to crush it while hot as well as dry, and if a battery is stopped for even one day, the screens must be taken out, washed and dried, and the feeder and mortar must be emptied and the ore returned to the dryer. Under these conditions it is evident that storage of crushed ore is not feasible, as it would soon become moist and be unfit for the roaster. Even the chutes to the feeders cannot be kept full of dried and salted ore, because it would become cold and damp, so the drier should be on the level of and adjacent to the feeders. If I were an Irishman I would advise that every iron thing for this climate should be made of brass or copper, if possible. At all events, steel screens for dry crushing batteries are not good for this country; all iron and steel rusts very fast. There are many other points, some relating to the character of the native workmen, which require to be taken into consideration in constructing works, and even in selecting a process for this country (or any other).

The common people here, or many of them, are petty thieves, and the loss of small articles may cause great inconvenience where it requires months of time to replace them; hence the Mexican plan of inclosing a mill with a good wall and having a gatekeeper is to be recommended.

I think the leaching process is eminently adapted to a place where the workmen generally are slow and unreliable, provided, of course, a *metallurgist* has charge, and has a *few* good assistants. C. H. AARON.

SANTA LUCIA, HONDURAS, Oct. 3, 1889.

ROLLING STEEL RAILS.*

By D. K. Nicholson, Steelton, Pa.

In a three-high mill a rail is made at one heat, and generally in eleven passes, from a bloom 7 inches square, or a little larger.

The first six passes are taken up in working the bloom from side to side into a billet, rudely, the shape of a rail. It is then ready for the finishing

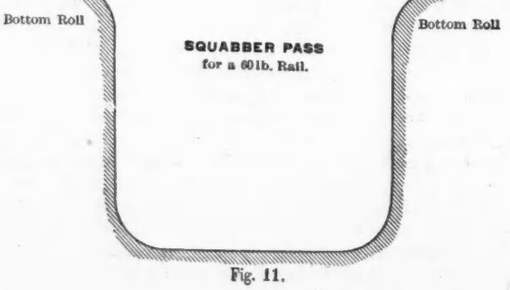


Fig. 11.

rolls. The seventh pass, or squabber, which is generally the first pass in the finishing train, is principally for forming the flanges of the rail (Fig. 11). The billet goes through this pass with the head down and the flanges horizontal; the flanges are caught between the two rolls, and made thinner and wider according to the distance between the rolls forming the pass. So that this pass has almost absolute control of the flanges. The rail passes through the three succeeding passes with head and flanges vertical, without any change except uniform reduction and a gradual increase in the

* Paper read at the meeting of the American Society of Mechanical Engineers.

height. Then the rail goes through the finishing pass, where the head is rounded (Fig. 8), and from that it passes on to the saws to be cut.

Assuming that the passes have been properly turned out, it is the essential feature of the whole matter of rolling a rail to have them all exactly filled. If the bar does not fill out to any pass, more stuff is put in the pass; this is done enlarging the preceding pass or passes by moving the rolls apart so as to bring out a bar of larger cross section. On the other hand, if the bar is of too great a cross section for the pass to roll out in length, the extra metal will squeeze out in the partings of the rolls, and either shear off or make a fin. The opposite course of treatment must then be resorted to.

Side-guards are used to guide the bar to the pass, and to aid in keeping it from twisting or drawing to one side on leaving the pass. Side-guards are sometimes called into play to put more metal into one side or the other of a piece by forcing it over, and compelling one side of the pass to rob the other. It is unnecessary to have a side-guard on each side of the pass when there is a greater amount of draught on one side of the bloom than on the other. The extra amount of draught on the one side throws the piece to the opposite side. There is then no need for a side-gaurd on the side the bar has no tendency to touch.

The purpose of a guide is to keep the bar from following the roll on coming out of the pass, when for any reason it has a tendency to do so. The pass in the rolls is turned out so as to throw the piece against the guide to insure the bar being delivered safely from the rolls. Guides and side-gaurds are then exactly as their names indicate, to "guide and guard" the bar in entering and leaving a pass in the rolls.

Finning and shearing comes from the metal squeezing between the partings of the rolls. It is the result, as stated above, of too much stuff going in the pass or part of the pass, or the bar not properly entering the pass. A small fin, or the indication of one, is the only positive evidence there is that the bar has filled out as intended. The wedge-like shape of the flange of a rail gives a considerable amount of end thrust to the rolls. If this thrusting is not met by a force sufficient to overcome it the rail will be higher on one side than the other, and have a thick and thin flange (Fig. 9).

Of all the troubles to be overcome in rolling a rail, the overfilling of

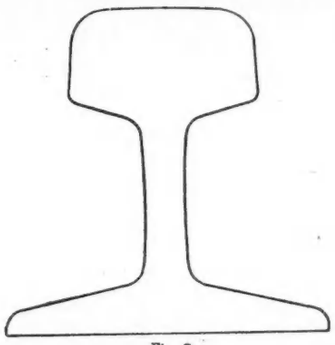


Fig. 8.

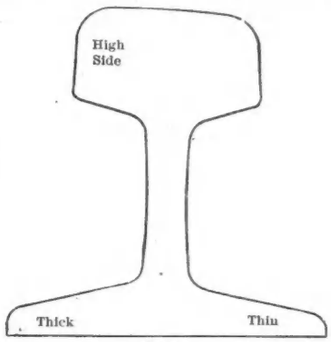


Fig. 9.

Fig. 10.

the head in the finishing pass is probably the greatest. There is no real remedy for it except returning the rolls. Since the head of the rail is made somewhat rounding, the two rolls must be parted at the middle of the head in the finishing pass. When the metal runs out between the collars it makes a fin, which is generally objected to more on account of its appearance than the harm it does (Fig. 10). The cause may be looked for in the pass immediately preceding the finishing, the leading pass. When the rail has too much stuff under its head on each side of the web on coming out of this pass, on entering the finishing there is nothing to oppose this side work at the middle of the head, where there is a space ¼-inch wide between the collars of the rolls. From this it is plain that the greater the angle under the head of the rail the more scope for the roll turner in the leading pass, and consequently the less liability to fin or overfill in the finishing pass. Rounding the collars with a file will sometimes make the overfilling less noticeable.

In speaking on the subject of the amount of draught that ought to be put on a piece of steel, no fixed rule can be given on account of the varying conditions under which a piece is rolled. However, taking nearly everything into account, 10 to 20 per cent. has been found to cover nearly all cases, when the piece is turned to receive work on all its sides. In breaking down a piece of steel, light draught tends to make the sides concave; the work seems to be confined near the surfaces on which it is being rolled. Heavy draught will have the opposite effect: It follows, as would naturally be supposed, that in the same rolls the hotter the piece the more the tendency of the stuff to go out in the length; while the colder and harder the piece the more spread, and consequently the more the tendency to fin. More spread may then be looked for in high carbon steel than in low carbon or mild steel. It might be here remarked that in either case the shape into which the piece is to be rolled has a good deal to do with an imperfection in the steel working out. For instance, a bad place in the part of the bloom falling to the head will work out, where it will not n the flange of a rail.

When a train of rolls is not strong enough, recourse can be had to three ways of making the rolls stronger: enlarging the diameter, shortening the body, and using better material in making the rolls. For every size bar there is a roll of a certain diameter that will make that bar probably better than a roll of any other diameter. Of course such a thing as having different size rolls for every section of rails would not be practicable. So a train is selected with respect to the average work that is to be done. Rolls of small diameter are more likely to work the flaws out of a piece of steel than rolls of a large diameter. There is very little spring in a roll with a short body. For these reasons alone it appears that the second of the above-mentioned schemes (to shorten the body) would be the one to adopt.

The great drawback to a cast-steel roll is the fact that the surface cracks so badly. They do very well for roughing or where enough passes follow to smooth the bar. A forged-steel roll cracks very much less than a cast roll, but the cost puts it out of the question. As for strength, they may be said to be everlasting. This puts somewhat of a limit on the material used for a finishing roll after going outside of the best mixture of cast iron.

In a three-high mill the passes in the top and middle rolls can be altered without disturbing the passes in the middle and bottom rolls. A two-high mill has the advantage in handling the bar, since it enters all the passes of the rolls on the same plane. And it is only necessary to have two rolls instead of three. But then in altering a pass shifting one roll affects all the passes except where the finishing pass is in separate housings, which is a good thing in either train. The great speed at which the rolls are run after the bar has entered the pass in a two-high reversing mill often goes against the proper formation of the rail.

In going above two lengths it is very necessary to take every precaution in putting down a mill. The long-continued strain in a set of rolls when 120 feet of rail go through is trying in the extreme on the rolls, especially as regards the end thrust. It is only by having several set screws and a well-babbitted surface on the lip of the brass, that the rolls can be held in their proper place in single lengths. In four lengths this would probably be double, and possibly more. Of course all this is not insurmountable if all the parts are made strong enough to resist the strain put on them, and the train kept in line—that is, the engine shaft, the pinion and roll to which it is coupled, having their axes in one straight line, and the axes of all the rolls in the some vertical plane; for besides the train pulling hard, when the rolls are not in the same plane, the piece is liable to come out twisted.

STEAM-PIPES FOR COLLIERIES.*

By E. F. C. Davis, Pottsville, Pa.

The most common and the cheapest method of carrying steam, taking the world at large, is probably through wrought-iron "gas-pipe" joined by the taper thread, screwed into sockets or ferules.

This answers admirably for small pipes, and even for comparatively large pipes where the conditions are favorable for screwing up the joints, and where the threads are not subjected to any serious corrosive action. Many of the steam-pipe lines in the anthracite coal regions, however, run for great distances underground, through contracted slopes and headings where it is almost impossible to make the screwed joint. In the screwed socket joint there is always some space between the ends of the pipes, and the condensed steam from the best available feed water is so corrosive that a cutting or furrowing action takes place between the ends of the pipes and the ferule, which sooner or later causes leakage. It is then impossible to tighten up these screwed joints without screwing up the whole pipe line.

Some of these difficulties are avoided by the use of "flange unions."

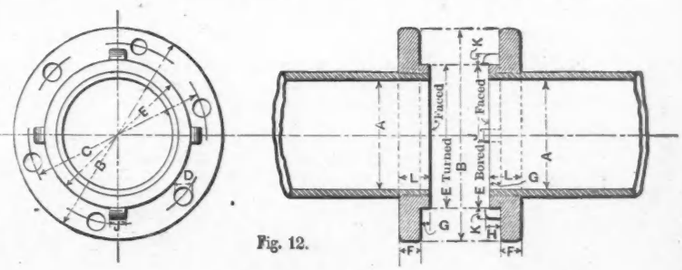


Fig. 12.

STEAM-PIPE FLANGE JOINT.

With these the pipe line can be more conveniently put together underground, and in the event of a leaky thread the flange can be screwed on tighter, or a defective pipe can readily be replaced by a new one of the same length. But in the ordinary flange union there is a space between the ends of the pipes, and the above-mentioned corrosive action is so destructive to the threads that cast-iron pipes have generally been considered necessary for reliable and durable steam-pipe lines, though the first cost is about double that of wrought-iron pipes.

In view of the foregoing, the Philadelphia & Reading Coal and Iron Company has adopted the flange joint shown in annexed cut for all colliery steam-pipes. These flanges are screwed tightly on the pipe—the pipe carried in a steady rest—and the end of pipe and flange faced off

* Paper read at the meeting of the American Society of Mechanical Engineers.

flush with each other. The lugs are at the same time bored out, and the projection turned off concentric with the bore of the pipe. This insures perfect continuity in the pipes, and the lugs also center the gum-joint rings accurately, so that a gum joint is obtained between the abutting ends of the wrought-iron pipes. The continuity of the bore of the pipe insures a free flow of steam and condensed water, so that all liability to furrowing at the joints is avoided and the gum-joint formed between the ends of the wrought-iron pipes protects the thread from all danger of corrosion. If an odd length of pipe needs to be made at a colliery, the pipe, if not over four inches, can be threaded with a handstock or die, and a finished flange screwed on until the pipe projects through. The pipe must then be filed off flush with face of flange.

In molding these flanges it is best to have the pattern arranged to leave its own cores. This insures accuracy in the position of the bolt-holes and the large central hole, relative to each other and to the other parts of the flange.

Several thousand feet of steam-pipe fitted with these flanges have been put in service, and have all proved perfectly satisfactory.

AMERICAN RAILROAD BRIDGES.*

By Theodore Cooper, Mem. Am. Soc. C. E.

(*Continued from page* 411.)

STRENGTH OF MATERIAL AND PARTS OF SKELETON STRUCTURES.

In the early days of iron bridge building, the knowledge of the strength of materials was very limited. The early experiments of Fairbairn and Hodgkinson comprised about the extent of our knowledge of the strength of iron.

Crude tests made upon grooved specimens of a small size lead to much misconception of the capabilities of American bar iron. In a pamphlet by Mr. Wendall Bowman on his Harper's Ferry Bridge, built in 1851–52, he states:

"The tensile strength of the best American bar iron tables as 80,000 pounds per square inch. Its practical value is generally rated at about one-fourth the nominal value. In the diagram (*this strain sheet*) the highest value of iron is 16,000 pounds, being reduced below any probable rate of fibral separation in any previous data."

Even as late as 1870, Captain Eads was assured by the manufacturers of bar iron that there was no difficulty in furnishing bars of any size, capable of standing 60,000 pounds per square inch, and he made the contract for the St. Louis Bridge with this expectation, only to be disappointed.

In 1878, when the requirements for the strength of bar iron, as contained in the Erie specifications, making a reduction in the ultimate strength as the size of the bars increased, was submitted to the most experienced ironmasters for their criticism, they were condemned by all with but one exception, Mr. Andrew Kloman, of Pittsburg: First, as being entirely too low in tensile requirement for good bar iron, and, second, in making any allowance for increased section of the bars, "there being no reason why the fibers in large bars should not be as strong as in the smaller."

It may be necessary to state that when these specifications were enforced, and the acceptance of the material became dependent upon the test made on either the bars themselves or specimens cut from the same, it was found that only the best and highest-priced bar iron could meet the requirements. The general tendency since then has been to relax them somewhat for a broader competition.

The Phœnix Iron Company and the Keystone Bridge Company had crude testing machines at their shops previous to 1870. They were used to test the strength of eye-bars and wrought-iron columns. In some of the more important structures, all the eye-bars were tested up to a strain of 20,000 pounds per square inch.

While these machines were crude, they did serve to develop the detail proportions of the eye-bar and column used by these companies. The use of steel and new forms of members in the St. Louis Bridge, in connection with the importance of the structure and the yet untried method of erecting as a cantilever, impelled the engineer and the contractors to unusual efforts to determine the capacity of the material and of the forms to be used. Of the many thousand tests made during the construction of this work, but a limited number have ever been published; the general deductions, however, soon passed into accepted doctrine, and developed a keener desire for a more refined knowledge of the influence of form and proportion upon all our bridge members. The eye-bar had been well developed under the crude tests previously made by the early bridge companies.

Full-sized tests had also been made on a limited number of wrought-iron columns. But no marked progress was made in the forms of compression members till after the tests of Mr. Bouscaren on the forms then in use. His tests not only showed the inapplicability of Gordon's formula, but also the possibility of much better results by improving the detail of the open and box columns; the only forms of columns without a proprietary claim, and the ones best adapted to the American style of bridges, as they gave ready facilities for connections without the use of cast iron. From this time forward rapid progress has been made in the detail and proportion of all our full sized bridge members.

To-day every first-class bridge manufactury has its complements of testing machines, to test with all the refinements either samples of the material or full sized members in compression, tension or transverse strain. Our knowledge of the strength and capabilities of our material and of the usual forms employed in the American style of bridge is such that no first-class bridge company in America hesitates to accept the clause now general in in all specifications, that "full-sized members may be tested to destruction," with the sole proviso that the expense of testing and cost of the piece shall be paid by the purchaser if it satisfies the requirements of the usual specifications.

This positive knowledge of the capacity of our full-sized members marks one of the great advantages of our system of bridges over all others. Our "factor of ignorance" has been reduced to this extent—a no mean portion.

We, therefore, have a right to claim, that as our working strains are as low and in many cases lower than those used in Europe, with our more perfect knowledge of the strength of our members, we have in our first-class structures a greater factor of security than prevails in European bridges.

MANUFACTURE OF BRIDGES.

There are to-day in America more than forty bridge-building companies manufacturing railroad and highway bridges. Of these, at least a dozen are capable of constructing bridges of every size in a first class manner. The shops, which can be called especially shops capable of constructing the largest class of railroad or highway bridges, are capable of turning out by the year 125,000 tons of bridge work.

It would be safe to estimate that all the shops could turn out 200,000 tons, or approximately 80 miles of 100 feet spans of single track railroad bridges, per year, if their plant were devoted exclusively to this work. Other iron work, as roofs, iron buildings, piers, elevated railroads, etc., however, make a considerable figure in their yearly output. Some few of the bridge shops have been constructed to do riveted work almost exclusively.

The typical American bridge shops are, however, fitted to do any class of bridge, girder or roof work, whether it be exclusively riveted, or combined riveted and pin-connected work. Each company has, therefore, the following arrangements for receiving the iron, and putting it through all the processes to the completion ready for shipment:

First.—Receiving yard, where the iron for each bridge is properly classified and stored.

Second.—Department for straightening, where pieces can be straightened with more accuracy than can be obtained directly from the rolling mills.

Third.—Template and pattern shop for preparing the templates for the rivet and pin holes and crude shapes and dimensions of all pieces, with the proper allowance for final tool finish.

Fourth.—Laying out shops, where each individual piece of iron is carefully marked in accordance with the templates.

Fifth.—Punch and shear shop, where all the iron is punched and sheared.

Sixth.—Fitting up shop, where all the iron for riveted members is assembled and bolted together ready for the riveting machines.

Seventh.—Riveting shop, with its proper complement of air, steam and hydraulic riveting machines.

Eighth.—Machine shop for planing, boring, turning, etc., to complete the finished bearing surfaces of all the members.

Ninth.—The upsetting and forge shops for making eye-bars and all forged parts required.

Tenth.—Painting and shipping sheds and yard.

The aim in the construction is to pass the material from the time of its receipt from the rolling mill to its final shipment through the necessary steps with as little waste labor in handling as possible and to perform all work by machinery in preference to hand labor.

While the laying out and riveting are done with all care and accuracy, the lengths of the members and the fitting of the same together do not depend upon the accuracy or neglect of these processes. The length of all abutting members and distances between centers of pin holes are determined finally at the machines for planing the abutting ends or for boring the pin holes.

Machines for operating on each end of such members are provided with iron beds and extremely accurate methods of setting the same to any required distances. Such machines once set and operated with proper precautions in regard to uniform temperature guarantee great accuracy of duplication of all similar parts.

It is sometimes claimed that there is an error in lengths of parts due to the usual allowances for play of the pins in the pin holes, varying from $\frac{1}{64}$ to $\frac{1}{32}$ of an inch, according to the size of the pins. This is an error; this allowance is provided for by either measuring from out to out of the pin holes for tension members and from the inside of the pin holes for compression members, or by taking it into consideration where the lengths are given from center to center.

The surety of the fitting of the members of even the largest structures after they have passed through a properly organized bridge shop is such that no assembling of the finished members of a structure is ever made at the shops, except in extremely crooked and complicated structures, and even then not as a whole, but only sufficient to test the fitting of specially intricate connections.

The rapidity of the erection of our structures, and the satisfactory manner in which they come together in the field without any tool work, prove the certainty of the American methods.

The erection of the two channel spans of the Cairo bridge is an example of rapid erection, which illustrates the possibilities of the American system of construction.

These spans are each 518 feet 6 inches center to center of end pins, 61 feet deep center to center, 25 feet wide center to center of trusses, panel lengths, 30 feet 5¾ inches. Total weight of one span, 2,055,200 pounds.

The first span was erected in six days. After this span was erected, the false works were taken down, the supporting piles drawn and redriven for the second span, the false works again put up and the second span erected.

The whole time covering the erection of the two spans and moving the false works was one month and three days, including five days' lost time, waiting for the completion of the masonry.

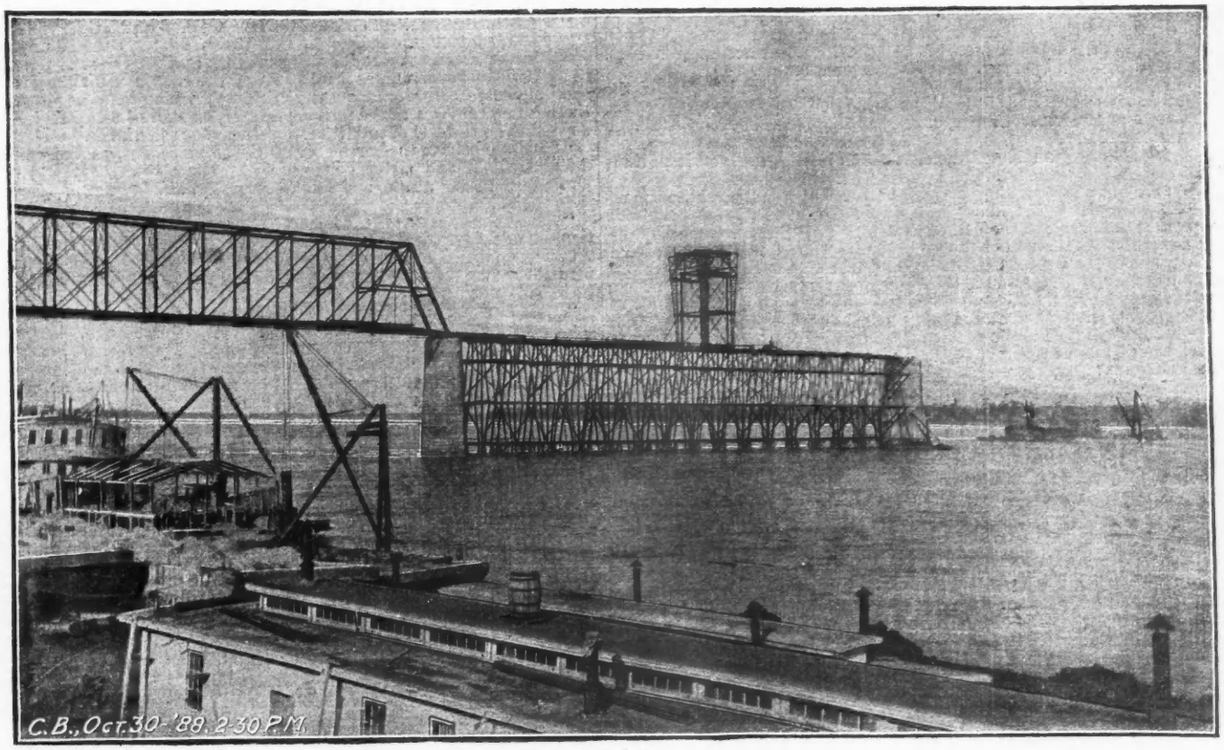
The false works and traveler were in position ready to commence the erection of the second span by 2:30 P. M., October 30th, 1888. At 2:50 P. M., November 3d, the trusses of this span and the top bracing were all connected. No work was done at night. The material was run on trucks about 1,025 feet from the storage yard to the nearest end of the span being erected. About twenty-four men were employed in delivering the material and fifty in erecting and connecting together.

The false works stand about 104 feet above low water. The bents being 72 feet high above the capping of the piles. The depth of water at its low stage is about 20 feet. The piles were from 50 to 75 feet long.

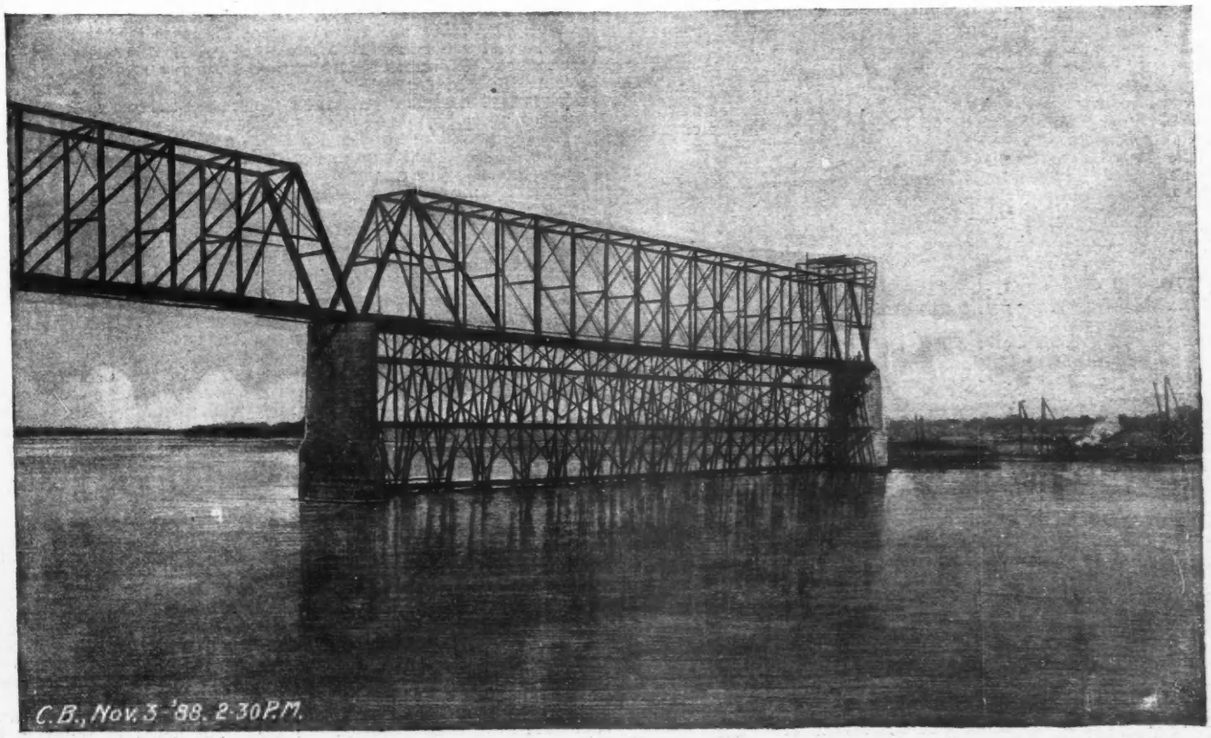
The erection of these spans was done by William Baird & Co., sub-contractors, under the Union Bridge Company, for this part of the work. Plates XX. and XXIV. are reproductions of photographs taken on October 30th and November 3d to show the work done in four days.

(TO BE CONTINUED.)

* Abstract of a paper read before the American Society of Civil Engineers.



CAIRO BRIDGE. OCTOBER 30TH. 1888.



CAIRO BRIDGE. NOVEMBER 3D. 1888.

THE ST. LOUIS SILVER CONVENTION.

The Silver convention which met on Tuesday in St. Louis, did not come up to anticipations in point of numbers, but was attended by some of the most prominent silver men in the country, among whom were Senator Stewart, of Nevada, Congressmen Bland, of Missouri, and Symes of Colorado, the Hon Thos. Fitch, of Reno, Nevada, and of course the well known group of St. Louis men identified with silver mining, Messrs. Jas. Campbell, L. M. Rumsey, Paul A. Fusz, and others.

Mr. James Campbell, on behalf of the Executive Committee, called the convention to order, and introduced Mr. L. M. Rumsey as temporary chairman, and Mr. Albert Singer, of the banking house of Kohn & Co., as temporary secretary.

Chairman Rumsey addressed the convention briefly, the most important of his remarks being the following:

"You are not a law-making body, it is true, but as all laws are the results of the popular will, and as you have been almost as popularly sent to represent the people of the United States, as are the members of Congress sent to voice the will of the people in Washington, it follows that the Congress of the United States may find through your deliberations and conclusions, that as you are the latest representatives from the people upon the question of the silver coinage laws, that they must obey the will of the people of the United States, and enact the laws—your body cannot enact—which will give to the people of the United States the privilege of coining their silver as freely as they coin their gold."

The convention then proceeded to business, and committees on resolutions, on credentials, and on permanent organization and order of business were appointed.

At the afternoon session on Tuesday the report of the Committee on Credentials was received; in fact, two reports were presented, a majority and minority report, arising out of the appointment of 100 delegates at large by the Executive Committee.

This difficulty was removed by a resolution proposed by Senator Stewart, of Nevada, which was carried, as follows:

"*Resolved*, That each State and territory which is represented be allowed to cast 20 votes, and that in addition the delegates present in excess of 20 be allowed to cast each one vote."

There was a great deal more discussion, however, engaged in by Messrs. Colvin, of Michigan, Symmes, of Colorado; Stewart, of Nevada; Harper, of Illinois; Curtis, of California; Kerr, of Colorado, and Pixley, of California. The latter thought the discussion had gone far enough, and it was ended by Senator Stewart moving the previous question. The amended report was then adopted, as suggested by Senator Stewart.

PERMANENT ORGANIZATION.

The Committee on Permanent Organization then reported as follows:

That the permanent officers of this convention be: Chairman, Hon. A. J. Warner, of Ohio; Vice-Chairman, Hon. J. M. McMichael, of Colorado. That the permanent secretary be A. Singer, of Missouri.

That there will be three assistant secretaries as follows: F. L. Dana, of Colorado; T. J. Palmer, of Kansas; John A. Grier, of Pennsylvania.

1. That each State and Territory and the District of Columbia, through their respective delegation, name a person as Vice-President of the convention.
2. That the discussion of the convention be confined strictly to the subjects embraced within the call of the convention, to wit: "The rehabilitation of silver as one of the money metals of the country."
3. That each resolution as introduced be referred by the Chairman, without debate, to the Committee on Resolutions; that each speaker be limited to 10 minutes, excepting from the operation of the rule such speakers as have been invited by the Executive Committee of St. Louis to address the convention, and such as may be specially invited by this convention. Your committee reports the following as the order of business for the convention:
   1. Report of Committee on Credentials.
   2. Reports of other committees, general and special.
   3. Introduction of resolutions.
   4. Addresses and discussions.
   5. Unfinished business.
   6. New business.

J. A. SMITH, Chairman.

ERNEST MELLIS, Secretary.

Gen. A. J. Warner, the permanent chairman, was then escorted to the chair by Senator Stewart, Hon R. P. Bland, and Mr. Fitzgerald, of Colorado. He was greeted with applause and spoke at some length. Speaking of gold and silver, and the pressing urgency of the question, he said:

"Undoubtedly, the effect of the partial demonetization of silver has been to separate and change the ratio of the commodity value of the two metals. One of the questions which you are here to deliberate upon is as to the wisest and best way to restore to its place as a money metal equally with gold the metal silver. For infinite ages prior to 1872 the world had settled down upon the two metals as money metals. The discussion to which I have referred has settled the proposition that the value of gold depends upon the stock of gold in the world, and the annual supply thereof as compared with the use of gold; that the value of silver likewise is determined by the quantity in the world and the annual supply added as compared with the use of silver, and when the use of either metal is restricted by legislation or any part of its use taken away arbitrarily, of course its value is affected, and the value of the money standard of the world becomes affected."

The second day's session had for its most interesting incident a long speech from Hon. R. P. Bland, in which he reviewed the history of the legislation in this country upon the silver question, and contended that silver has not fallen, but that gold has appreciated. In conclusion, Mr. Bland made an urgent appeal for unlimited coinage of silver.

On Thursday at the morning session, while waiting for the Committee on Resolutions to bring in their report, a resolution was offered by Mr. Fitch, of Nevada, and adopted, providing for the appointment of a National Silver Committee, which should be empowered to call another National Silver Convention and provide for the election of delegates thereto. Also that the said National Silver Committee be empowered to provide for the organization of State and National silver leagues for the promotion of the objects of this convention.

Congressman Bland, chairman of the Committee on Resolutions, presented the following report:

"The National Silver Convention, held in St. Louis, November 26th, 27th and 28th, 1889, adopted this premable and resolution as their deliberate opinion:

"That the demonetization of silver has worked a practical violation of every contract then existing in the United States, entailed uncounted losses, reduced prices more than 30 per cent., and its effect is practically to make debts perpetual, as it takes from the debtor the ability to pay; that it causes contraction in the currency, which reduces values until there is no profit left to the farmer, planter, or man of small capital, who depend upon the sale of products for returns for their labor.

"That we believe the certificate of the government, backed dollar for dollar by gold and silver coin, on the product in the Treasury of the United States, is a safe and sound currency, and has been approved by the people.

"That, considering the contraction caused by the surrender of national bank notes during the past three years, and the vast sums that must be collected by the cancellation of government bonds during the next three years, the necessity of restoring silver is as manifest as is the justice of such a policy.

"That the gold and silver of the West, pouring in a steady stream upon the East for 40 years, vitalized every form of business there, and steadied and upheld the credit of the nation through the great war and made resumption possible, and that what we now demand is as much more to the interest of the East than of the West as the productions of the East exceed in value the productions of the West.

"That we believe in equal rights of gold and silver and free coinage for both, and that no nation ever had or ever will have too much gold and silver. Now, therefore, be it

"*Resolved*, That the Fifty-first Congress be requested by this convention to provide at its first session for opening the mints of the United States to the free and unlimited coinage of standard silver dollars of the present weight and fineness, to be legal tender for all debts, public or private, equal with gold, and that until such a provision is made the Secretary of the Treasury be required to coin the maximum, $4,000,000 worth of silver, per month, as now authorized by law."

At the afternoon session the chairman appointed the following committee to prepare a memorial address to Congress: J. A. Grier, of Pennsylvania; F. J. Field, of Missouri; C. C. Goodwin, of Utah; J. W. Porter, of Virginia, and J. F. Scott, of Ohio. Chairman Warner thanked the convention for the kind attention and courteous consideration shown its presiding officer, and, on motion, the convention was declared adjourned *sine die*.

THE CATORCE MINING DISTRICT.

Written for the Engineering and Mining Journal by R. E. Chism, M. E.

(*Concluded from page* 389.)

By a slight change in the course of the tunnel and by a small additional up-grade, it could be made to come out at a distance of 800 meters (2,600 feet) further on from its present extremity, upon the side of the gulch somewhere between the church in Catorce and the mouth of the Cochino tunnel. This would afford a level road from the center of the town out to the head of the Cedral valley, which would be of immense benefit to the whole district, and would no doubt insure a fine revenue to the proprietors of the tunnel. The tunnel is laid with a tramway and re-enforced with masonry in the weak parts. In almost all the tunnels in this camp mason work is used instead of timbering, as the cost of the two is about equal and the stone work is so much more durable.

The Cochino tunnel is opened in the side of the gulch just above the town of Catorce, and connects with the Compromiso and Concepcion shafts, and also with an underground shaft called the Pilar. The Pilar shaft is used for pumping and hoisting, and is fitted with Cornish pumps and a hoisting engine, all worked by the steam from the boilers at the mouth of the Concepcion shaft some 1,500 feet away. The machinery is located underground in an immense chamber, excavated in the solid rock, lined and arched with masonry. The roof is a very pointed gothic arch, double groined. It is said to have caved in three times before it was finally made to stand, and the whole cost of the chamber, a most admirable work in itself, is said to have been about $20,000. The tunnel is used only for drainage and for the entrance of the workmen; it has no tramway, but is provided with the usual substantial buildings at its mouth. This is one of the most characteristic things in the district; wherever buildings are erected they are strong, massive, and, quite often, elegant.

The descent into the Concepcion mine from the tunnel level is made by a wooden stairway, as easy as in a dwelling house, which seems to wind around the interior of a shaft. The steps are two meters (6½ feet) wide, and there is a substantial hand rail on each side and numerous landings. This structure is said to extend to a depth of some 600 feet below the tunnel level.

The Boquiero tunnel was projected to cut the San Ramon vein, but its direction has been changed, and it is now being driven to open into the Veta Grande or Sta. Prisca shaft on the Veta Madre. It will be 1,174 meters (3,870 feet) long when completed, and will cut the shaft at 217 meters (710 feet) from the surface. This tunnel will cut eight known veins along its course and probably several blind leads.

The Coyote tunnel of the Santa Ana mine enters the Santa Ana shaft at 384 meters from its mouth and at 153 meters from the surface. It has an extension which is to cut the San Jose de Villanos, Rayas and possibly the Veta Madre veins, and a branch which is being extended toward the Alta Gracia, San Geronimo and Santa Rosalia mines on the San Geronimo vein.

The Santa Ana mine is located on a branch of the San Geronimo vein and has a great deal of water. The water from the lower levels is hoisted to the level of the Coyote tunnel in great iron tanks, holding 630 gallons each, which work on wire guides. The steam for the hoisting engines is supplied from boilers at the mouth of the tunnel and conveyed a distance of over twelve hundred feet.

As there is a terrible loss of power by this arrangement and as fuel is scarce and very dear in Catorce, I am not surprised to hear that the drainage by this means has been a failure, although the intelligence and ac-

tivity of the superintendent of the mine deserved a better result. The tunnel has a tramway of 32-inch gauge.

The Refugio is an enormous tunnel, provided with a wonderful array of massive buildings at its mouth, through which the Luz and other mines of that group are worked. It is provided with a tramway.

The Cruz tunnel, near the mouth of the Coyote tunnel, is now abandoned. I am not informed with what mine it was intended to connect.

Very little timbering has been done in all these tunnels, as the rock is a limestone with but few weak places, and these have generally been shored up with masonry.

COSTS OF MINING.

In the various mines the work done in drifting is of variable cross section, but probably six feet wide by seven feet high is the most usual size. The driving of a drift of this size is paid for at from eight to thirty dollars, the meter of advance, according to the hardness of the rock, the amount of water, the depth underground, or other local circumstances of the kind.

The cost of transportation of a ton of ore from the working faces to the surface is affected by several circumstances. Where the distance is considerable and part of the transportation is done through a tunnel, to which the ore is conveyed on the backs of men, to be taken the rest of the way in cars, the cost is about 40 cents per ton, whereas the same amount carried an equal or equivalent distance entirely on mens' backs would probably cost double as much. Hoisting the ore through a 500-foot shaft, by steam power, in hide bags, is said to cost 20 cents a ton.

About 1,400 pounds of dynamite and 900 pounds of black powder were used in the mines at Catorce during one week of last December. Allowing that this is equal to 1,700 pounds of dynamite, and that the production of ore that week was 700 tons, the average consumption was 2·43 pounds of dynamite per ton of ore raised. This excessive consumption is explained by the fact that the mines are doing a large amount of exploring and dead work. The estimate of the powder used for extraction alone in a particular mine was one-half a pound per ton of ore extracted.

The hand picking or cleaning of the ore is done at the mouth of the mine by old men too feeble to work underground. The cost of this is part of the contract system to be explained further on. It is probably from 30 to 40 cents per ton of cleaned ore. I have already estimated that from three to five tons of rock are knocked down in these mines to obtain one ton of cleaned ore, but this estimate is not very reliable, as the supervision of the total output is not strict enough to enable any exact statement to be made on this point.

The mines immediately about Catorce were worked in December, 1888, by some 750 men. Of these some 300 were skilled miners, the rest being ore carriers, cleaners, etc. There are in addition to the above about 90 employés, including head miners, timekeepers, machinists, clerks, engineers, and superintendents. At the present time the working force has increased to about 1,000 men, but the number of salaried employés is still less than 100, The small number of employés indicates that the mines are worked with considerable economy in this particular, especially when we consider the low wages which are received by the bulk of the staff.

In the La Luz mine, which has a less proportion of pumping and other fixed charges of exploration, the production per man of the working miners was about 1½ tons of ore per week. In the Concepcion mine, where more dead work and continual pumping is being done, the production per man is about one-half of the above. Excluding dead work, the production per man would probably reach two tons of ore per week.

At present, August, 1889, the statistics of production, which I have been able to obtain, are as follows for the month of July :

Mine.	Tons per week (2,000 Mex. lbs.).
Concepcion	380
San Agustin	80
La Luz	200
Ave Maria	200
Dolores Trompeta	80
Padre Flores	10
Santa Prisca and San Jose	55
All other mines	30
Total	1,125

As I have before noted, the average silver contents of this ore will be about 75 ounces per ton. I am informed that there is practically no gold in the ores of Catorce. It is certainly not taken into account in estimating the profits of a mine, but when a more economical mode of treatment than the patio process comes into use, it may be found that the gold will cut some figure.

Returning to the question of the cost of extraction, we find that it is complicated by the fact that all the working miners in this district are paid for their labor with a portion of the ore, and are, to that extent, partners in the mine. So far is this system pursued, that even the mine managers and employés are conceded the right to work certain stopes in the mines of their own choice and for their own account. The ore from these stopes is divided among the employés concerned, according to their category, and its value is an addition to the salary, which is often greater than the salary itself.

On Monday morning of each week the head miner portions off the mine and assigns to certain individuals, the captains of gangs of miners, the part where each gang is to work. The individual who represents any gang sets to work with his men, who number from four to ten, gets out all the ore he can and presents it cleaned and picked at the mouth of the mine on the Saturday following. A yard or "*patio*" at the mouth of each mine is set apart for this purpose, and is occupied every Saturday by the heaps of ore belonging to the different contractors or "*partidos*." The value of the ores is estimated by panning a sample from each heap in a horn spoon, and the heaps are divided between the mine owner and the contractor according to the richness of the ores.

For ore with from 53 to 265 ounces per ton the contractor receives one-fourth of the product: of the ore with from 265 to 530 ounces the contractor gets one-fifth of the product; and of the ore with more than 530 ounces per ton, one-seventh of the product. The above proportions are varied somewhat, according to the particular circumstances of each mine, but in general the proportions of the division are as stated

The head man of each working party receives all the ore to which that party may be entitled and sells it either to the mine or to *rescateadores*, ore buyers on a small scale, who abound in the district. The money obtained from the sale of the ore is divided among the gang according to the deserts of each one. Of course, there are many cases in which the weekly gains of such a party are comparatively enormous, while in other cases the return is next to nothing. In such a case, the mine owners often make up the sum resulting from the sale of the little ore which may have been obtained by the party to an amount sufficient to pay a fair day's wages to each one of the workmen. The wages of a skilled miner by this system are supposed to average about $2 per day all the year round. This is, of course, more than is paid when the men are working for the mine on day's wages; but, no doubt, by the contract system more work is done and less supervision required, so that the increased wages are well-earned. The mines furnish the tools used by the contractors, keeps them sharpened, and transports the ore to the surface. The contractors pay for their own powder or dynamite, fuse and candles, and must clean or hand-pick the ore.

The following estimate of the cost of a ton of cleaned ore, with from 53 to 265 ounces per ton, was furnished me while at Catorce:

	Per ton of 2,000 lbs.
Transportation from the workings to the surface	$ 0.42
Tools, explosives, fuse	0.49
Candles	0.25
Labor	3.50
Total	$ 4.66

To this must be added the cost of drainage, whether by pumps or by tunnels (in the latter case the cost of drainage is the interest on the capital invested in opening the tunnel, plus the cost of maintaining the same in transitable order), interest on the value of the plant and of the mine, deterioration of the same and general expenses. These will bring the total cost of a ton of ore up to a figure between seven and ten dollars per ton in the ordinary run of producing mines. The cost of treatment of these ores is from $20 to $35 per ton by any of the old systems.

DRAINAGE.

The mines of Catorce have always been noted for the considerable quantities of water which they contain, and which stands usually at about one hundred meters from the surface at the present time. Of course, with all the tunneling that has been done, the regimen of the underground waters of the district has altered considerably, and the water level must be lower down than it was many years ago. This water is the drainage of an extensive region for which the veins act as discharge pipes, so that the amount of the water is affected by the rainy season and a very large increase in the volume to be handled in the mines takes place annually toward the end of that part of the year. I have already made some mention of the tunneling work that has been done in Catorce, which is supplemented in some places by pumps and hoisting engines. As to the cost of these operations I have only a few figures relative to the Concepcion mine.

I have already described the Cochino tunnel and the Pilar shaft, which are part of the drainage works of the above mine. At the mouth of the Concepcion shaft proper there is a plant with a double hoisting engine, with cylinders 12 × 18 inches. This is supplied with steam by two boilers of 75 horse power each, which also supply the steam for the underground hoisting engine and the pumps located at the mouth of the Pilar shaft in the vaulted chamber. The hoisting engine at the mouth of the Concepcion shaft raises the water in rawhide bags about ten feet high and four feet in diameter, which bring up about a ton of water every three minutes from a depth of some 650 feet. This is about 220 gallons a minute for the hoisting engine, and the pumps are said to raise some 180 gallons a minute, making the total discharge 400 gallons a minute. In December, 1888, the plant was just about holding the water, or, perhaps, gaining a very little. The steam used in the Pilar shaft is carried some 1,500 feet, which involves a loss stated at ten per cent., probably more. The fuel used is roots of trees, which are brought a long distance at a cost of about $5 per ton, delivered at the plant, and has about half the heat-producing efficiency of an equal weight of pine wood.

The cost of raising the water was stated to be ten cents a ton, using both the pumps and hoisting engine and including all expenses. By the hoisting engine alone the expense was stated at twenty cents a ton. At a certain mine in the State of Mexico, where I had an opportunity of observing the cost of drainage, the water was raised by Cornish pumps with a 12-inch column to about the same distance as at the Concepcion mine at a cost of five cents a ton, as estimated by another person, and at three cents a ton by my own estimate. At the latter mine the boilers are located near the pumping engine, and the fuel is solid cord wood.

The above figures are probably the lowest cost of pumping in Catorce, as the machinery at the Concepcion mine was new, well made and in good order. A reduction can be made when mineral fuel is used.

Since the conclusion of the Mexican National R. R., in November, 1888, the conditions of exploitation have materially changed in Catorce, and the miners have scarcely yet comprehended the full significance of the change from one of the most isolated to one of the most accessible mining districts in the Republic. Supplies are to be had at a lower rate and the disposal of the products of mining is rendered much easier. A tremendous impulse was given to mining by the appearance of American ore-buyers, who competed for the carbonate and other lead ores which were almost useless before that time, and large quantities of which were standing untouched in some of the mines. In December, 1888, the ore-buyers were paying $1.06, Mexican, per ounce of silver for all silver over 17 ounces per ton, and 3 cents a pound for all the lead over 17 per cent. I am not informed what price was paid for dry silver ores. This trade has been almost destroyed by the late action of the United States Treasury Department regarding the admission of lead ores.

WATER.

Catorce has an abundant supply of water for domestic uses, but not enough for the use of metallurgical works, except for such operations in which the water can be used over again. For concentration purposes, almost any of the mines affords water enough from its own drainage.

LABOR.

As before noted, nearly all the work done in the Catorce mines is paid for in ore. Whatever other work is needed is done under contract whenever such an arrangement can be made. The laborers, when they work for the mine, are paid at 50 cents a task, which, for an active, industrious man

means from 75 cents to $1 a day. The cost of drifting has been noted as from $8 to $30 a meter, in drifts about 2¼ meters wide and high. When on task work two skilled miners are expected to drill between them two holes, each 2 feet deep, for 75 cents each. If the holes are 1 meter (39 inches) deep, they get $1 each.

Coal can now be delivered in Catorce at any of the mines near the town for about $15 per ton. The cost of freights to Catorce station from any central point in the United States, such as Chicago, would be about two cents a pound. For transportation from the station to the mines the cost will be about $6 a ton, unless unusually heavy or bulky pieces of machinery were to be taken in, in which case the cost would be rather more. Timber can be easily brought in from more southern points in Mexico, near to or within a reasonable distance of the railroad, or from Texas or Louisiana.

The climate of Catorce is delightfully cool in the summer time, although the sun is warm. In the winter Catorce is bleak and cold. It is a spot where a stove would seem to be admirably appropriate, yet there is but one, that I know of, in the town, and the owner of that one had taken it down at the time of my visit because his friends would insist on sitting upon it. On April 3d, 1888, the thermometer in a sheltered place at the mouth of the Purissima tunnel stood at 63½ deg. F. at 9 A. M., and on December 6th, 1888, it stood at 45 deg. F. at 11 A. M. at the mouth of the Chorro tunnel. Up town on the same day, at 3 P. M., it stood at 55½ deg. F. The death rate of Catorce is estimated at 25 per 10,000, which is not high considering the class of population and the peculiar dangers to which miners are exposed. The markets are supplied with a fair quality of meat and a good variety of vegetables, as well as with fruits of all the many varieties found in Mexico.

CONCLUSION.

I have heard it asserted that Catorce is a worked out district: but I hope that my readers will understand by this time that this assertion is very far from being true. None of the Catorce mines are very deep, and in all of them the veins continue strong and well defined to the very bottom. There has been a great deal of ore left standing in the "colorados" region, above the water line, which would not pay exploitation under the old conditions, but which can now be worked with profit. The region of the "negros" has only been commenced upon, although the comparatively little work done there has been sufficient to show that its products are richer than the "colorado" ores. Beside, this there are many mines and several veins in the district which have been left almost untouched by any serious exploration, and which will almost certainly prove producers and may turn out as well as any of the mines or veins that are better known. Finally, cheap, skilled labor and an accurate local knowledge of the veins and formations will, in the long run, largely compensate for the absence of bonanzas, even in the face of increased natural difficulties, if the veins continue to be moderately productive.

The golden age of Catorce will come when the mines are laid out so as to avoid the use of expensive human labor for mere transportation, when draining is done by well-proportioned pumps or by tunnels whose cross section is not so great as to make them inordinately expensive when tunneling, drifting and stoping are mainly done by machinery with power supplied by mineral fuel (which ought to be laid down from the coal mines in Coahuila, not much over three hundred miles to the northward, for one-half of the price quoted above), and when more economical processes are applied to the treatment of the ore. Almost any one of the good mines which I have mentioned, handled judiciously under such a system, can be depended upon to do as well in the future as it ever has done during any given series of years at any time in its history.

MEXICO, August 29th, 1889.

Liverpool & Birmingham Canal.—The survey for a canal between Liverpool and Birmingham has just been completed and estimates of the probable cost prepared. The scheme is to construct a canal through Staffordshire, uniting with the Weaver Navigation at Winsford. The canal is to have a breadth of 72 feet, and will be navigable by vessels of 500 tons. Hydraulic lifts will be used instead of locks. The length between Winsford and Birmingham will be 64 miles, and the whole length of the waterway 104 miles. The expense of construction is put down at £2,500,000. A bill is to be promoted in Parliament to enable the work to be carried out.

Great Britain's Production of Pig Iron and Steel in the First Half of 1889.—The total production of pig iron in Great Britain, according to Mr. J. S. Jeans, secretary of the British Iron Trade Association, in the first six months of 1889 was 4,083,597 gross tons, against 3,995,830 tons in the last half of 1888, and 3,902,804 tons in the first half of 1888. The increased production in the first half of 1889, as compared with either of the half years of 1888, does not correspond with the greatly increased activity of the iron and steel industries of Great Britain, and hence we find that there was a decrease in the stocks of unsold pig iron from December 31, 1888, to June 30, 1889, of 357,840 tons, and from June 30, 1888, to June 30, 1889, of 442,992 tons. The stocks of pig iron held by makers and in warrant stores on June 30, 1889, amounted to 2,230,868 tons, against 2,673,860 tons on June 30, 1888, and 2,588,708 tons on December 31, 1888.

The total production of Bessemer steel ingots in Great Britain in the first half of 1889 was 1,043,256 gross tons, against 961,313 tons in the last half of 1888, and 1,051,481 tons in the first half of 1888. The production of Bessemer steel rails in Great Britain during the first half of 1889 was 468,325 tons, against 491,909 tons in the second half of 1888, and 487,174 tons in the first half of 1888. These figures indicate that the Bessemer steel industry of Great Britain has been practically stationary during the last three half years. In the whole of the year 1888 the production of Bessemer steel ingots and Bessemer steel rails was somewhat less than in 1887. It is remarkable that the manufacture of Bessemer steel rails in Great Britain should make such slow progress in late years.

The total production of open-hearth steel ingots in Great Britain in the first half of 1889 was 730,721 gross tons, against 676,321 tons in the second half of 1888, and 616,421 tons in the first half of 1888. This branch of the steel industry of Great Britain shows a large increase in production in the first half of 1889 over either of the two half years of 1888. The production of 1888 was itself largely in excess of that of 1887.

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.]

A Practical Treatise on the Manufacture of Bricks, Tiles, Terra Cotta, etc. Second Edition, thoroughly revised. By Charles Thomas Davis, Publisher of the *Brickmaker*, of Chicago, Ill. Published by Henry Carey Baird & Co., Philadelphia, and Sampson Low, Marston, Searle & Rivingston Ltd., London. Pages 501 and Index. Illustrated. Price, $5.

Formulas and Tables to Facilitate the Construction and Use of Maps. By Robert Simpson Woodward. Bulletin No. 50. Pages 124.

Fossil Fishes and Fossil Plants of the Triassic Rocks of New Jersey and the Connecticut Valley. By John S. Newberry. Volume XIV. Pages 152 and Index. Illustrated. Monographs of the United States Geological Survey. Published by the Government, Washington, D. C., 1888.

Geology of the Quicksilver Deposits of the Pacific Slope, with an Atlas. By George F. Becker. Volume XIII. Pages 486 and Index. Illustrated.

Inventors' Manual. How to work a patent to make it pay. By an experienced and successful inventor. Published by J. F. Davison & Co., New York, 1889. Pages 98 and index. Price, $1.

Invertebrate Fossils from the Pacific Coast. By Charles A. White. Bulletin No. 51. Pages, 102. Illustrated.

Jahrbuch für das Berg-und Hüttenwesen im Konigreiche Sachsen auf das Jahr, 1889. By C. Mensel K. T. Bergamtsrath. Published by Cras & Gerlach (Joh. Stettner), Freiberg, Germany. 1889. Pages 241. Illustrated.

Latitudes and Longitudes of Certain Points in Missouri, Kansas and New Mexico. By Robert Simpson Woodward. Bulletin No. 49. Pages 133.

Steam. By William Ripper, Professor of Mechanical Engineering in the Sheffield Technical School. Published by Longmans, Green & Co., New York, London, 1889. Pages 202 and index. Illustrated. Price 80 cents.

Subaerial Decay of Rocks and Origin of the Red Color of Certain Formations. By Israel Cook Russel. Bulletin 52. Pages 65. Illustrated.

The American Railway. Its Construction, Development, Management, and Appliances. Written by the most eminent authorities in all branches of railway work, with an introduction by Judge Thomas M. Cooley, Chairman of the Interstate Commerce Commission. Published by Charles Scribner's Sons, New York. 1889. Pages 456 and Index. Illustrated. Price $6.

The Form and Position of the Sea Level. By Robert Simpson Woodward. Pages 88. Bulletin No. 48.

The Geology of Nantucket. By Nathaniel Southgate Shaler. Bulletin 53. Pages, 54. Illustrated. All issued by the United States Geological Survey. Published by the Government, Washington, D. C., 1889.

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.

ISSUED NOVEMBER 26TH, 1889.

415,701. Car Coupling. Napoleon Boudreau, Garden, Mich.
415,704. Gaseous Fuel Burner. Thomas A. Bryan, Baltimore, Md.
415,710. Separable Electric Conductor for Railway Gates. Frank E. Fowler, Lynn., Mass., Assignor of one-half to Henry A. Marks, same place.
415,738. Process of Electrolytically Obtaining Copper. Hermann A. Seegall, Berlin, Germany.
415,745. Wheel for Railway Vehicles. Wm. Stroudley, Brighton, County of Sussex, Assignor to himself and Samuel Carlton, Swindon, England.
415,747. Electric Meter. Elihu Thomson, Lynn, Mass.
415,750. Apparatus for Actuating Hydrostatic Presses. John H. Vaile, Dayton, O.
415,780. Machine for Drilling Railway Rails, etc. Eben N. Higley, Somerworth, N. H.
415,784. Rod-rolling Mill. Gustaf Jansson, Munkfors, Sweden, Assignor of one-half to Charles H. Morgan, Worcester, Mass.
415,791. Journal-Box for Sheave-Wheels. William Phenix, Chicago, Ill.
415,792. Oiling and Adjusting Device for Cable Sheaves. William Phenix, Chicago, Ill.
415,794. Artificial Stone. Archibald C. Ponton, Viewfield, Parkstone, County of Dorset, Assignor to Benjamin Lewin Mosley and Crompton Chambers, both of Hastings, England.
415,822. Air-Compressor. Henry C. Sergeant, New York, N. Y., Assignor to the Ingersoll-Sergeant Rock Drill Company.
415,823. Hoisting Apparatus. Walter A. Sharp, Poughkeepsie, N. Y.
415,842. Turbine Water Wheel. William C. Meadows, Moravian Falls, N. C.
415,856. Electric Heating Apparatus. Charles E. Carpenter, Minneapolis, Minn., Assignor of four-sixths to F. W. Nevens and John W. Kelly, both of the same place.
415,908. Petroleum-Motor Engine. Karl Gramm, Berlin, Germany.
415,910. Device for Lubricating, Cooling and Cleaning Car-Journals. James K. Hardwicke, Marshall, N. C.
415,931. Hydraulic Air-Compressor, Joseph Weyland, Guttenberg, N. J., and William Lang, New York, N. Y.
415,941. Crushing Mill. Gideon Frisbee, New York, N. Y.
415,955. Car-Axle. Jacob E. Blackmore, Pittsburg, Pa., Assignor of one-half to Samuel J. Wainwright, same place.
415,970. Coal Chute. Daniel H. Henkels, Philadelphia, Pa.
415,976. Sectional Steam Boiler. Nat. W. Pratt, Brooklyn, N. Y.
415,997. Friction-Clutch. Lewis B. Clapp, Fitchburg, Mass.
415,998. Car Brake, Jean B. Z. Dumais, Chicago, Ill., Assignor of one-half to Joseph Donnersberger, same place.
415,999. Concentrator. George Gates, Drytown, Cal.
416,007. Heating Furnace for Rolling-Mill Plants. Charles H. Morgan, Worcester, Mass.
416,018. Glass Furnace. Asa G. Neville, Lazearville, W. Va.
416,013. Dynamo-Electric Machine or Motor. Andrew L. Riker, New York, N. Y.
416,014. Method of and Means for Making Tubes. James Robertson, Birmingham, England.
416,088. Coal Chute. Francis G. Susemihl, Detroit, Mich., Assignor of two-thirds to Asa G. Dailey and James D. Hawks, both of same place.
416,021. Ore Concentrator. Charles H. Voll, San Francisco, Cal.
416,034. Duplex Force Pump. William H. Grove, Circleville, O., Assignor of one-half to Clifford R. Dresbach, same place.
416,058. Piston-Rod Packing. William Grob, Fremont, O.
416,067. Friction Clutch. Frederick C. Miller, Newport, Ky.
416,071. Compressor Pump. Edgar Penney, Waynesborough, Pa.
416,077. Manufacture of Tubes. James Robertson, Birmingham, County of Warwick, England.
416,081. Railroad Tie. Theophilus F. Thomas, Grand Cane, La.
416,085. Crucible for Lead Furnaces. Newton R. Wilson, Socorro, N. Mex.
416,086. Process of Separating Lead Bullion from Matte and Slag. Newton R. Wilson, St. Louis, Mo.
416,090. Device for Transmitting Power. Alexander W. Best, Brooklyn, N. Y., and Herbert G. Underwood, Marion, N. J., Assignors of one-half to Alfred H. Briggs, Marion, and Charles A. McLaughlin, Martinsville, N. J.

PERSONALS.

Mr. Jas. F. Beattie has accepted the position of General Superintendent of Mines of the Sloss Iron and Steel Company, at Coalburg, Ala.

Prof. W. P. Blake has returned to New Haven, Conn., after an absence of some months. Mr. Blake has been engaged in the examination of Western mining properties.

Messrs. Douglas L. V. Browne and M. F. Laffan have gone to Honduras in the interests of an English syndicate, which, it is stated, is about to engage in extensive mining operations in that country.

Mr. Thorston Berg, who recently resigned his position as Chief Engineer at the Edgar Thomson Steel Works, Braddock, Pa., has accepted a similar position at the Homestead Works of Carnegie, Phipps & Co., succeeding Mr. Aiken.

Mr. H. D. Hibbard, who for some time past has had charge of the melting department of the Linden Steel Company, Pittsburg, Pa., has resigned, to take the management as Superintendent of the Hainesworth Steel Company, the controlling interest in which was recently purchased by the Oliver & Roberts Wire C ompany, of Pittsburg.

Mr. Robert Monger, of Centreville, N. J., formerly of Swansea, England, has been engaged by Messrs. H. C. Woltereck & Co., well-known chemists, of Chattanooga, Tenn., as assistant in their laboratory. Mr. Monger is one of the many professional gentlemen who have procured their positions through the column "Positions Vacant" of the ENGINEERING AND MINING JOURNAL.

Mr. John Sutcliffe has resigned his position as general manager of the Londonderry Iron Company, Limited, of Londonderry, N. S., and returns to his home in Poughkeepsie, N. Y., where he will open an office as consulting engineer and contractor. He will continue to act as consulting engineer to the company. Mr. Sutcliffe will be succeeded by Mr. R. G. Leckie.

OBITUARY.

James Brown, one of the oldest railway contractors in New York State, died in Rochester, N. Y., on the 23d inst., aged 83 years.

George Wiggan, probably the oldest coal operator in Pennsylvania, died at his son's residence in Germantown, Pa., on the 27th inst., aged 89 years. He was born in London, and came to this country in 1834. For six years he was superintendent of the Little Schuylkill Navigation Company in Philadelphia. Later he was manager at Port Clinton for the same company. In 1847 he opened a colliery near Tamaqua, and in 1858 he opened a colliery on the Bear Run track-in connection with his son, George F. Wiggan. Mr. Wiggan retired from active business about 1860.

INDUSTRIAL NOTES.

The Lehigh Iron Company, at Aineyville, Pa., has blown out furnace No. 1 for repairs, and No. 2 has been put in operation.

It is reported that a company with a capital, when fully paid in, of $2,000,000, of which Judge W. A. Hudson, of Alabama, is to be the president, is being organized by Philadelphia capitalists to operate iron furnaces in Florence, Ala.

The New York State Bureau of Statistics has established headquarters in Room No. 160, Stewart Building, New York City. Mr. E. J. Kean and Commissioner Peck are in charge, and will compile statistics of all strikes and their causes.

Messrs. Coldwell, Wilcox & Co., iron manufacturers and contractors, of Newburg, N. Y., have made a general assignment to Thomas Coldwell, of the Chadborn & Coldwell Manufacturing Company, for the benefit of their creditors.

It is reported that an aluminum factory is to be established at Ohiopyle, Fayette County, Pa. The names mentioned in connection with the enterprise are Messrs. D. Shriver Stewart, of Washington, D. C., and W. T. Bernard, of New York.

The output of the furnace of the Warwick Iron Company, at Pottstown, Pa., for the week just closed was 814½ tons of iron, the largest for a single day being 124 tons. It is an anthracite furnace, and its size is 16 by 70 feet. The furnace was completely repaired and remodeled this summer, and went into operation again October 5th last.

At a meeting of oil-well tool manufacturers at Oil City, Pa., recently, an organization to regulate prices was formed. The membership of the new organization, it is stated, includes nearly all the manufacturers of drilling tools, etc. The idea is said to be to advance prices slightly, and make all prices and discounts uniform. The new lists and prices will go into effect Dec. 1st.

The Crescent Iron Works, Samuel L. Moore & Sons' Company, Elizabethport, N. J., have applied to the Navy Department to have a commission appointed to examine its plant and report on its ability to undertake the construction of steel vessels for the government. The company is anxious to bid on the 1,000-ton gunboats and the Naval Academy practice cruiser, and it adds one more to the list of firms ready to compete for naval work.

The New York & Harlem Railroad Company has resumed the running of its electric cars with new batteries made after the process awarded to them by Judge Lacombe in his recent decision. These batteries are found to be more efficient than the old ones, owing, it is thought, to more efficient machinery employed in their manufacture. The cars will be put in service gradually, as new batteries are received from the manufacturing company.

The main building of the Hecla Iron Works, in Brooklyn, N. Y., was destroyed by fire on the night of the 25th inst. The works are owned by N. Poulson, M. Eger and B. E. J. Eils, and are valued at about $200,000. The estimated loss is nearly covered by $100,000 insurance. The fire broke out in the foundry and was attended by an explosion. The burned building was five stories high, and was almost entirely destroyed, including a portion of the one-story foundry building. Mr. Poulson said that he could give no idea of the origin of the fire. A large number of valuable patterns were destroyed, but those for the *World* building were saved. The works are known throughout the country as manufacturing every description of iron-work. Mr. Poulson states that there would be no loss from inability to fulfil contracts, as the company expected to get to work again within a week or two in case the insurance was settled promptly.

CONTRACTING NOTES.

Manufacturers of machinery, engineers and contractors should consult our directory of "Contracts Open" on page xx. This week proposals are invited for the following work: Conduit construction; Building; Trestle; Granite; Wood Work; Grading; Bridge; Dredging.

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.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from 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 American 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.

These services are rendered gratuitously in the interest of the 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.

383. Ice plant of four-ton capacity. Texas.
384. Wool scouring machinery to be run by Leffel, or turbine water wheel. Texas.
385. Mold for artificial stone work for front of building-window caps, sills, etc. North Carolina.
386. Machine for splitting fire wood. North Carolina.
387. Second-hand engine lathe, 16 inches swing, 6 foot bed. Drop hammer about 100 pounds drop. Medium size power press. All in first-class order, and must be cheap for cash. New York.
388. Band saw mill complete with carriage; capacity about 15,000 feet per day. Virginia.
394. Two horizontal cylinder boilers and one 125 h. p. engine delivered and set up in Illinois.
395. Railing makers' shears and punch, to punch at least ⅝-inch iron. New York.
396. Five-ton ice machine. Kentucky.
397. Wood-working machinery for variety works. Planes, molders, band, scroll and cut-off saws and lathe. Georgia.
398. Boiler, 50 H. P. New York.
399. Light rails, about 27 pounds per yard. New York.
400. Steam Drills. New York.
401. Contractors' dump cars, wheel barrows, and other rock-working tools. New York.
402. Machinery and appliances for hotel of 100 rooms. Kentucky.
403. Complete outfit for manufacturing excelsior, consisting of power, four double machines, and mill for grinding shucks for making mattresses. Georgia.
404. Tennant machine for finishing spokes. South Carolina.
405. Corliss engine and two boilers. New Jersey.
406. Engine, 75 H. P., second-hand automatic cut-off. New York.
407. Lathe. Special lathe for turning axles for mine cars. Ohio.
408. Machinery for making cotton ropes. Georgia.
409. Engine and boiler of about 40 H. P. New York.
410. Freight elevator. New York.
411. Vertical engine, 50 H. P. New York.
412. Fifty-light dynamo, incandescent. New York.
413. Bridge machinery. Iron and steel. Maryland.
414. Drag saw and bolter rig for shingle mill. Arkansas.

AMERICAN GOODS WANTED ABROAD.

351. Agency wanted for some good make of well-drilling outfits. New South Wales.
352. Wanted, full particulars, prices, etc., of the giant steel welding and hardening compound. New South Wales.
353. Wanted, prices and discounts for graphite grease for wire ropes. New South Wales.
358. Scales; wanted exclusive agency. Australia.
369. An engineer in Sweeden desires to get catalogues, price list and samples of graphite lubricants with the object of introducing them in Norway and Sweden.
370. Machinery of the latest and best make for manufacturing iron and steel bolts, nuts, screws and tapping. England.
389. Lawn mowers. Catalogues, prices, discounts, etc. Ceylon.
390. Electric blasting apparatus and blasting powders, and how same can be shipped from New York to Ceylon.
391. Stencil inks and plates; also rubber stamps with movable figures and letters. Ceylon.
392. Catalogues of all kinds of American hardware. Hawaiian Islands.
393. Information about nail-making machines, with estimates and cuts of same. Turkey.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the district mentioned below for the season up to and including November 20th, as reported by the Marquette, Mich., *Mining Journal*, were as follows:

	Tons. 1889.	Tons. 1888.
Marquette, Marquette District	1,370,428	832,247
St. Ignace, " "	51,853	107,399
Escanaba, " "	988,157	823,700
*Gladstone, " "	20,597	.....
" Menominee District	47,653	.....
Escanaba, " "	1,622,765	1,088,072
" Gogebic District	289,733	205,357
Ashland, " "	1,474,714	1,014,000
Two Harbors, Vermillion District.	819,639	437,760
Total, tons	6,685,559	4,508,535

*The shipments from Gladstone, Marquette District, are shipments from the Republic mine, and from Gladstone, Menominee District, shipments from the Chapin and Ludington mines.

The last annual report of the President of the Northern Pacific Railroad contains the following:

The development of mining interests in Montana, Idaho and Washington has been more remarkable during the last year than that of any other special industry or source of traffic, and has been larger than in any previous year. The acquisition of the Cœur d'Alêne Railway and Navigation system, the establishment of a large smelter at Helena, as well as the activity of the Great Falls, Denver and other smelters, have afforded a very large traffic in ores, matte, and bullion, the ores being procured in the Cœur d'Alene district being in especial demand. These lead ores and concentrates are very essential to the successful reduction of the dry ores produced in other parts of Idaho, Montana and Washington, as well as in other Western and Southwestern States and Territories. Buyers from nearly all the smelting companies of the West are represented in the Cœur d'Alene district, actively bidding for ores which they must have.

New smelters have been built, or are in process of erection, at Tacoma and Portland, and others are projected on extensive plans at other points on our lines.

Of the business incidental to that of mining, the most marked is perhaps the traffic in coke, mining salt, and mining timber. During the last year 13,565 tons of coke were transported, with approximate earnings of $117,823—a moderate increase in tonnage and earnings over the previous year. It is our practice, in order to secure the best results from this business, to sell coke delivered at the mines, consequently the price of the commodity affects the earnings. The price of coke, the larger part of which is obtained in Pennsylvania, has been steadily decreasing during the last few years, averaging during the last year about $15.35 per ton delivered. Coking plants have been established at two or three points in Montana, which are giving fairly good results, and with the improvements that will follow experience the demand will undoubtedly soon be supplied locally. While this will reduce our haul, it is believed we will thus be enabled to control a larger proportion of the business, and probably derive a larger net revenue therefrom. We feel, however, that coke is so important a factor in the reduction of ores that we can afford to transport it at a very small

margin of profit and thus increase tonnage in the more important items of ore and bullion.

The tonnage of mining salt for the year was 7,845 tons, an increase of 2,547 tons, but a smaller relative increase in earnings accounted for by the necessity of adjusting rates to the price of the commodity, which, as in the case of coke, we sell delivered to consumers.

The tonnage of lumber and timber for use in mines and in the construction of reduction works, has been large and constant, and is an important source of revenue that will exist as long as mines are in operation; in addition to which great quantities of cord-wood are transported from local points in Montana for fuel at the various smelters, where it can to some extent be more economically used than coal.

ARIZONA.

GILA COUNTY.

OLD DOMINION COPPER.—This company is said to be enjoying an unusually prosperous season. Two furnaces are in blast, and a third is being repaired to be ready in the event of its being needed. The company has considerably increased the force of workmen at the mine and smelter.

CALIFORNIA.

ALPINE COUNTY.

ALTURAS.—The Alturas, or Billy Rogers mine, in Hope Valley, is now in litigation. San Francisco parties are plaintiffs and the estate of E. Barnes, deceased, is defendant. Early in the sixties, says the Genoa *Courier*, ore was shipped from this mine to San Francisco and used in the manufacture of bluestone. Thousands of dollars have been spent in developing the mine and as soon as the pending litigation is settled the property will be put on a paying basis.

BUTTE COUNTY.

CHEROKEE.—This mine will make a clean-up at the close of this month, and the superintendent expects $50,000 as a result of the four months' run. This, it is stated, will make $150,000 for the year. The monthly expenses of the mine, according to a Virginia City paper, have been $5,000. The arrangements for drifting in this mine, which has heretofore been worked by the hydraulic process, are said to be nearly completed,

COLORADO.

The Secretary of the Interstate Commerce Commission, at Washington, has received the answer of the Denver & Rio Grande Railroad Company to the complaint filed by the four Leadville smelting companies, as published in the ENGINEERING AND MINING JOURNAL of October 12th. The answer denies that the Denver & Rio Grande Railroad, and other roads with which it connects at Pueblo, Colorado Springs and Denver, form a through line to any Missouri river point. and denies that it has any arrangement with any of the lines with which it connects for any continuous carriage of bullion from Leadville to the Missouri River. It avers that it has not joined with connecting lines in making joint tariffs, nor has issued through bills of lading, but that its responsibility ceases at the terminus of its own line. It is denied that the railroad company makes a through rate of $16 per ton, or any other through rate, but it receives $8 per ton and no more nor less for local transportation over its own line. Several pages of the documents are devoted to an argument designed to show that $8 per ton is not an exorbitant rate for such service. Referring to the Salt Lake rate of $13 per ton, the railroad people admit the rate and that they receive a proportion of such rate by agreement, but deny the figures of division stated in the complaint. They say the Denver & Rio Grande and Rio Grande Western receive out of this $13, $8.12½ cents per ton, which is divided between them. They justify this apparent high figure, as compared with the Leadville rate, by citing the fact of competition of the Union Pacific Railway from Ogden, and say if the rate were increased bullion from Salt Lake would be carried to the Pacific coast and thence to the Atlantic seaboard by water routes, or else the Utah smelters would shut down. They also cite the expense of shipping bullion from the mines to the Utah smelters, the high prices of coke, coal, iron ore for fluxing, etc., and say the Utah smelters and Leadville smelters do not come in competition with each other.

BOULDER COUNTY.

(From our Special Correspondent.)

The mining industry has prospered in Boulder County during the past year, and the outlook for the future is very encouraging.

The only drawback, so far, has been the ruling in relation to the importation of lead ores from Mexico. This ruling had the effect of causing the smelters to advance their charges for the treatment of dry ores, and as this county does not produce any lead ores, properly so called, we are compelled to pay our share of the tax without being in any way benefited by the enhanced price of lead. In fact we are injured, as we are consumers and not producers of the lead. Notwithstanding these facts, we clamor for more "protection against Mexican lead ores,' and fondly hope that, in some mysterious manner, we will finally become rich through the payment of taxes. Of course we do not know exactly how to explain the (alleged) fact that prosperity and high taxation go hand in hand; but we have confidence in our leaders, and accept the statement

The lead men tell us that the medicine is good for us, and we take it cheerfully, even gladly. Bitter as it is, we swallow it smilingly, and ask for more—and get it. Our masters know what is good for us, and give it with a liberal hand.

I said above that we were injured; but I must have been mistaken. If we only live long enough to pay taxes enough, everything will come right in the end.

And now having convinced myself that what looked like a drawback was not really one, I will mention that ore shipments from this country have been unusually heavy this year, and that appearances indicate a still greater increase for next year. Many ores that have heretofore gone to waste will be concentrated into a merchantable product. A number of new mills have been built and others are projected. One of the most interesting discoveries made during the year has been that of an enormous body of auriferous slate. Parties were boring for oil and coal six miles northeast of town, and at a depth of 350 feet struck a compact black slate, which continued without interruption, till at a depth of a little more than a thousand feet operations were discontinued for want of money. Samples of the slate from near the bottom of the hole assayed from $4.80 to $12 per ton in gold, seeming to grow richer as depth was gained.

The extent of the deposit is unknown, but the slate has been found at points several miles apart, and there is little doubt that it underlies a large extent of country north and east of here.

Since writing the above, I have been told that the slate grows lighter colored near the bottom of the hole, and that the richest is of a light-gray color and comes from the bottom.

I will get some samples for analysis, if possible, and let you know the result.

BOULDER, Colo., Nov. 15, 1889.

CLEAR CREEK COUNTY.

ATLANTIC PACIFIC RAILWAY TUNNEL COMPANY.—As reported by the special correspondent of the ENGINEERING AND MINING JOURNAL in Clear Creek County last week, preparations are under way to resume work more vigorously than heretofore. This scheme has been before the public for ten years or more. Its originator and its moving spirit is Mr. Mark M. Pomeroy, otherwise known as "Brick" Pomeroy, of national notoriety. Its stockholders are said to number 4,000, and come from every part of the country where Pomeroy's unique publications have penetrated. The project, as set forth by the company's president, is probably familiar to the readers of the ENGINEERING AND MINING JOURNAL. It is intended, Mr. Pomeroy says, to tunnel Mount Kelso on the Great Divide, and thus shorten the distance by rail from Denver to Salt Lake City and the Pacific Coast. In addition to this the stockholders believe they will find rich mineral veins, the outcroppings of which appear on Mt. Kelso and other mountains of the range. An ENGINEERING AND MINING JOURNAL reporter called upon Mr. Pomeroy in New York City this week to ascertain the present status of the enterprise. "We are going ahead as fast as time, cash and circumstances will permit," said Mr. Pomeroy "We have been hampered by lack of capital and unforeseen obstacles in our work, which has caused many to say that our stockholders have been swindled, but we are now on a basis where we can rely on actual results to refute all condemnations. The company was organized in 1880, and has a capital stock of $7,000,000, divided into 700,000 shares. In 1887 I was elected President, and thereupon secured the payment of all our debts. An issue of $2,000,000 in bonds was authorized. Of this amount $250,000 has been actually offered to the public, nearly all of which has now been subscribed for. We are now entirely free from debt, have paid the interest on our bonds, and have money guaranteed for the same for some time to come. At the annual election in Denver on November 2d, the following board of directors was elected: John D. Whitney, Bridgeport, Conn.; O. L. Snyder, Buffalo, N. Y.; Louis B. Jones, New York City; M. M. Pomeroy, New York City; B. F. George, A. W. Kellogg and A. S. Whitaker, Denver. I have also been appointed financial agent of the company for ten years. The present length of the tunnel is 2,100 feet. Originally we calculated the thickness of the granite capping, judging from the outcropping above, at 800 feet, but we have now found that it dipped westward, and we are emerging from the granite into the quartzite and thence into the poryphry dikes, where mineral should be found. We should get through the quartzite in five or six months. The entire tunnel, with standard-gauge railway and illuminated throughout by electricity, should be completed in four years."

YARMOUTH MINING AND MILLING COMPANY.—The property of this company, to which we referred in our issue of September 7th, embraces six claims, the Mary Foster, Lizzie Y, Schall, Goodall, Compfield, Groff and Gilmore all of which are patented, and located in the Cascade mining district, seven miles from Idaho Springs. The Lamartine which is said to be paying dividends monthly, is in the same district. The Yarmouth Company has a capital stock of $200,000, shares $1 each. The improvements are a shaft house and a large plant of machinery. The deepest shaft on the property is down 250 feet and the present working shaft is 90 feet. During October, it is stated, only seven men were employed, and the ore extracted and milled paid the total expense of mining and surface improvements. Mr. Swayne, of Central City, is the superintendent. A small streak of smelting ore lately uncovered in the mine is claimed to be rich in silver, and there is said to be a good body of medium grade. The offiers of the company are George F. Batchelder, president; O. P. Whitcomb, vice-president; J. H. Vincent, secretary and treasurer. The directors are: W. H. Markham, of St. Louis; George F. Batchelder, O. P. Whitcomb, W. S. Swayne and G. O. Keeler, of Denver.

HUERFANO COUNTY.

SOUTHERN COLORADO COAL COMPANY.—The Sulphur Springs coal mines, owned and operated by this company, of Denver, that have been under attachment and in the hands of the sheriff for a week, have paid off their employ's, amounting to over $11,000, and the trouble all having been adjusted between the stockholders, the mine will be released and work resumed. The attachment was for $25,000, and was held by the First National Bank of Denver.

PITKIN COUNTY.

(From our Special Correspondent.)

Ore shipments for the week ending November 22d, was 1,586 tons, an increase of 266 tons over last week. Concessions between miners, ore buyers and railroads are being talked of, promising increased ore shipments and general business activity.

The trial of W. H. Enfield, charged with stealing ore from the Aspen Mining and Smelting Company resulted in acquittal, the jury being out some 48 hours. Stringent measure are being adopted for the prevention of any further ore stealing.

ARGENTUM JUNIATA.—The incline in this mine is down 340 feet along the foot-wall. Two levels will be started on the contact, one at 150 feet from the head of the incline, the other at a depth of 350 feet.

COMPROMISE.—This mine is producing 50 tons per day. A Bleicherts improved system of wire rope tramway, manufactured by Cooper, Hewitt & Co., Trenton, N. J., will be in operation next week.

DEEP MINING AND DRAINAGE COMPANY.—The Homestake shaft has now reached a depth of 410 feet in silicious lime. A new shaft house is being completed preparatory toward placing a large plant of machinery under the direction of Mr. Cooper.

J. C. JOHNSON.—In this mine, at a vertical depth of 1,100 feet and 160 feet above the plane or track of the Smuggler Mountain tunnel, a body of fine grained galena was encountered. Twenty-five to 40 tons are being hoisted daily.

JUSTICE.—Is building a large shaft house 40 × 60 feet, over the shaft which is 4½ × 9 feet in the clear, 270 feet in depth, and now in the contact between shale and blue lime.

LAST DOLLAR.—Shipping 15 tons of $90 ore per day. Mr. Richard Fisher, Superintendent.

REGENT.—This property on Smuggler Mountain is continuing to produce 40 tons of ore per day. Mr. W. H. Yankee is superintendent.

SILVER BELL No. 1.—In Tourtelotte Park is producing about 15 ton per day, under the management of Mr. Charles Field.

SAN JUAN COUNTY.

LADY HELEN.—This is a new property, which is reported to have been purchased for Robert Lucas, of St. Louis. It is one of the contact properties located on South Mineral Creek, near Silverton. The basis for the sale is said to be $40,000, the first payment being made before December 1st, and the balance being strung along for a period of 18 months. It is stated that the claim was only staked last August. The ore is said to be native, brittle and wire silver, and is about six inches wide on the flat vein and about 10 inches in the vertical.

CONNECTICUT.

HARTFORD COUNTY.

BRISTOL COPPER AND SILVER MINING COMPANY.—We condense the following from a press dispatch: The ancient copper mines at Bristol, in this State, have been reopened during the past eighteen months, and large sums of money expended in the revival of operations. Thirty-five years ago these mines were controlled by a syndicate, with Benjamin F. Silliman, of New Haven, as the leading spirit and adviser. The water privilege connected with the mines was developed at an expense of $40,000. The company met with success as long as economy prevailed in the management. The copper ore was abundant. In 1857, however, the entire concern succumbed to the panic, and from that time until a year and a half ago the enterprise was regarded as a hopeless one. The property ultimately passed into the hands of John M. Woolsey, of New Haven. The mines were dismantled. Two years ago a New York State company conceived the idea of reworking the products left on the surface by the original company. The accumulation from the mines comprised 50,000 tons of tailings which could be profitably worked by modern machinery. William E. Tillotson, of Pittsfield, Mass., was the president of the company; William H. Robertson, of Albany, vice-

president, and Edward S. Francis, cashier of the Pittsfield National Bank, treasurer. The board of directors included Henry W. Gilbert, of Poughkeepsie, and James H. Mead, of Albany. E. G. Hubbell, a native of Hudson, N. Y., but for sixteen years prior to 1887 in charge of the Berkshire Athenæum, at Pittsfield, was appointed superintendent. The shafts, which have been filled with water and débris for thirty years, were pumped out, the operation lasting for more than six months. After a depth of 20 feet the woodwork in the mine was found to be as solid as on the day in which it was erected. When the bottom of the deepest shaft was reached, Superintendent Hubbell began the work of carrying it down to the depth of 370 feet. The work has been completed for 340 feet, and rich ore has been found, showing that the mine will be an extremely profitable venture. Native copper was found at 390 feet, and this week the native ore has been taken out in considerable quantities at the 340-foot level. Mineralized rock was passed through in sinking the shaft. but the drift will not be worked for the present. When the 60-fathom level is reached, a drift will be extended in search of the leading vein of ore. This mine, which promises so much, is at the foot of Mine Mountain, four miles northeast of Bristol, being midway between that town and Unionville. Silver has also been found in it in paying quantities In the southern section of the town a silver mine has been found, and gold has actually been found in the direction toward Southington. The silver mine is on property controlled by the Downs family, of Bristol. The mining plant will be completed in three months.

DAKOTA.

LAWRENCE COUNTY.

CALEDONIA MINING COMPANY.—The last regular report of Superintendent Skinner read as follows: 'During the week ending November 18th the new south drift on the 400-foot level in the foot wall has advanced 43 feet, and the northern drift from the west ground, which are to meet, has advanced 48 feet in the same time. Winze from No. 1 east end of the 500-foot level is down 87 feet, advanced 11 feet in the last week. General condition of the mine good."

Now that the excitement in the stock of this company has apparently subsided, there is a general inquiry for an explanation of its cause. Apparently the excitement would have been averted had the directors at the time of the suspension of dividends accompanied the announcement of such suspension with a full explanation of the cause therefor and of the present condition of the property.

DEADWOOD TERRA MINING COMPANY.—Messrs. Lounsbery & Co. inform us that the credit balance of this company on October 1st was $146,260. The product for October was 20,635 tons from which was realized $39,624 or $1.92 per ton.

HOMESTAKE MINING COMPANY.—The credit balance of this company on October 1st was $35,603. The October product was 22,775 tons, from which was realized $91,225, or $4.05 per ton.

IDAHO.

BOISE COUNTY.

In this county, it is asserted, quartz mining interests have advanced more rapidly this year than during any previous year. Plowman's 10-stamp mill at Shaw's Mountain, which had remained idle for many years, ran most of the summer on good ore, and is now idle only on account of a sale negotiating; the Elkhorn five-stamp mill, north of Idaho City, which had also remained idle many years, has made several successful runs; the new Washington 10-stamp mill is completed and running successfully; the Elmira Company, operating mines at Banner, finding their 20-stamp mill inadequate to crush the large quantities of ore coming out of the Wolverine and Crown Point mines, have concluded, it is reported, to build a new one with 50 stamps next spring.

CUSTER COUNTY.

SALMON RIVER SMELTING COMPANY.—It is reported that a new five-stamp concentrating mill, with three jigs, has just been started up at Kinnikinic Creek, at Clayton, by this company.

LEMHI COUNTY.

VIOLA COMPANY, LIMITED.—At a meeting of the stockholders in London recently a plan for the reorganization of the company was adopted.

SHOSHONE COUNTY—CŒUR D'ALENE DISTRICT.

KNICKERBOCKER.—Mr. F. M. Frank has bonded the Knickerbocker and Daisy claims located on Rosebud gulch, west of the Nellie mine owned by Horton & Alger. The ledge on the Knickerbocker, says the Wardner *News*, is visible 700 feet, varying in width from 2½ to 4 feet. Mr. Frank will continue the work of development during the winter.

POLARIS.—The main tunnel of this mine has been driven 500 feet. At a distance of 100 feet from the entrance an upraise has been made to connect with a winze now down 100 feet. The hoisting works formerly in use on the Apex mine on Deadwood gulch has been removed to the Polaris, and is now being placed over this winze on which, says the Wardner *News*, the work of sinking will be continued. Thirteen men are employed under the supervision of E. M. Gilpin.

INDIANA.

INDIANA NATURAL GAS AND OIL COMPANY.—Notice of incorporation has been filed in Porter County by this company, organized in Chicago, with a capital of $2,000,000. The five directors elected are Patrick A. McEwan, John D. Cohrs, Anecito Hoyos, Frederick S. Winston and Robert C. Bell. They will pipe natural gas from Indiana to Chicago. Many farmers will fight their having right of way for the pipes, etc. Some farmers propose to sell the land, and not lease the right of way.

MAINE.

HANCOCK COUNTY.

Bangor men have lately taken an interest in the Gouldsboro copper mines and have a force of men now at work there getting out a cargo of ore, which will be shipped to Portland to be smelted.

MICHIGAN.

COPPER MINES.

ALLOUEZ MINING COMPANY.—The stamp mill of this company was shut down on Nov. 1 for an indefinite period. Up to that date, says the Michigan *Copper Journal*, ten drills had been working in the mine. Hereafter, but four drills will be worked, these for exploring purposes. One will be used in opening up the amygdaloid belt previously referred to in these columns and the other three worked in the mine proper.

HURON MINING COMPANY.—We condense the following from the Boston *Transcript*: A letter reviewing the situation of affairs at this mine says that the outlook is improving; a paying lode is opening up at the fifth level south of No. 10 shaft. Work was started two weeks since in the eighth level, to the south of this shaft, and the lode is showing good stamp copper. There appears to be considerable ground in this part of the mine (the south) which will pay to stope. Good stamp rock also is shown in the seventeenth level, south of No. 8 shaft, which level is about under No. 10 shaft. In the nineteenth level south of No. 6 shaft (the Huron's active shafts are Nos. 6, 8 and 10) a class of rock above the average is producing. This shaft is sinking below the point named, in order to open up what promises to be a productive ground. The lode is improving in the seventeenth level north of No. 6 shaft, both in size and in appearance. As the lode here has been lean for a long time, this improvement is gratifying. The November product of the Huron will be about 120 tons of mineral.

MONTANA.

BEAVERHEAD COUNTY.

It is reported by local papers that the consolidation of the Carlisle and Empire mining companies has been concluded, the new corporation having a capital of $325,000. The Carlisle company recently purchased the Phil Shenon mines, as noted in the ENGINEERING AND MINING JOURNAL of October 12th. The Empire mine, which is owned by an English company, and which has not been operated recently, will be started up again.

DEER LODGE COUNTY.

CHAMPION MINING COMPANY.—This company, whose property is situated on a section claimed by the Northern Pacific Railroad on the ground that it comes within the land embraced in its grant, and that the company is entitled to it because it was returned to the land office non-mineral, is taking active steps to contest the claim of the mining company. A protest signed by all the officers of the company and a large number of the stockholders has been sent to Secretary Noble, which details the improvements, both at the mine and mill, calls attention to the fact that the lands are not valuable, save for their mineral production, and shows that hardship and injustice would be visited upon the owners of the property should the land office render a decision adversing their protest, which is now pending. Work at the Champion Mine and mill, it is reported, is being pushed ahead and it is thought the mill will be in operation by January 1st. The plan of mortgaging the property for $20,000, which was carried out recently, was thought, after consultation among the directors, to be preferable to placing the reserve treasury stock on the market at the present time.

FRANKLIN.—It is reported that a contract has been let to extend the tunnel of this mine five hundred feet.

SILVER CROWN MINING COMPANY.—This company has been incorporated to operate in the Oro Fino district. Its property consists of a full claim, the Silver Crown, which is situated between the Champion and the American Ruby. A shaft has been sunk to a depth of 30 feet and it shows about a foot and a half of high grade free milling silver ore. The officers are R. L. Hornbrook, president; S. D. Stuart, secretary; Thomas Stuart, treasurer, and Edwin Simpson, superintendent. The company will have 500,000 shares of a par value of $1 each.

JEFFERSON COUNTY.

GOLD DUST.—The Montana correspondent of the St. Louis *Republic* says that this mine has been sold to a Hartford, Conn., syndicate, the consideration being $30,000 cash and a block of stock in the new company. The mine is developed by a 300-foot tunnel, while a number of drifts and cross-cuts have been driven. The mine, the correspondent states, has paid all the expenses of its development.

PARK MINING CO.—This company, it is reported, will continue the active development of its property this winter. Only one shipment has thus far been made to the smelter. Next spring, it is stated, the company proposes to put on a concentrator, there now being a large quantity of concentrating ore on the dump.

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—Leading directors and officials of this company visited Great Falls, Cascade County, last week—where the company, it is stated, proposes to erect a large copper smelter and refinery—in company with Mr. Paris Gibson, from St. Paul. The party comprised A. S. Bigelow, of Boston, treasurer of the company; Leonard Lewisohn, of New York, director and selling agent; Edward S. Grew, of Boston, owner and representative of large interests in the Montana and a director in the Tamarack Mining Company; Charles O. Parsons, consulting engineer of the Boston & Montana Company. The party remained two or three days, and, under the guidance of Mr. Parsons and Mr. Gibson, devoted the time to an examination of Great Falls and surroundings, including the falls, smelter site, Sand Coulee coalfields, etc. At the conclusion of their visit here the party proceeded to Butte, to inspect the company's mining property there. On returning to Boston they expressed themselves as more than satisfied with what it saw, particularly with the Mountain View property. Estimates place the amount of product as high as 1,000 tons of ore daily when the new smelter is completed and at work. It is stated that it will not be long before the Harris-Lloyd tunnel property, acquired last year, will be developed up to a producing capacity of 1,000 tons of ore per day. The ore in this property is a little richer than in the Mountain View. The Mountain View now employs 115 men, which force it is said will be increased to 200 when the smelter is built. The company sends out a circular, giving notice of a special meeting at Butte City, Mont., January 15th, to vote on a proposition to mortgage the property to secure $500,000 bonds, to run 10 years, and be otherwise secured by an annual sinking fund of 10 per cent., or $50,000. The pamphlet describes the property to be mortgaged, to wit, certain mining properties in Montana, also nearly 500 acres of land at and near Great Falls, Ont. The books close for this meeting January 2d and reopen January 16th. The circular accompanying the pamphlet is "to impress upon the stockholders the importance of prompt action in forwarding their proxies. Three-fourths of the stock must be represented at the meeting, and two-thirds of the stock must favor the mortgage, otherwise the company will be forced to pay the entire cost of the new smelting works from its earnings. It is manifestly for the interests and benefit of the shareholders that these smelting works should be erected without delay, as it will better insure the continuance of present dividends should the price of copper rule very low, and consequent increase of dividends should copper hold at a fair price as at present." Proxies are solicited in favor of the plan.

SOUTHERN CROSS MINING COMPANY.—This company has taken an eight months' lease of the new Salton Cameron ten-stamp mill at Georgetown, and the stamps have begun dropping on ore from the Southern Cross mine. The ore at present being milled, according to the Montana *Mining Review*, will run from $12 to $16 per ton.

SILVER MOUNTAIN MINING AND MILLING COMPANY.—This company has been organized with the following officrrs: A. Fred Wey, president; W. H Nichols, vice-president; John Helehan, secretary; John Florence, general manager. Trustees: P. A. Gamer, J. E. Rickards, John Floerchinger, George Floerchinger. It was formed for the purpose of developing three claims in the Horseshoe Bend on the Big Hole river, ten miles southeast of Melrose. The capital stock is $3,000,000, shares $5 each. The mines have been worked, it is stated, on a small scale since 1884, and the ore is of a free milling silver character. It is said to be the intention of the incorporators to list the stock on the St. Louis Mining Exchange.

NEVADA.

EUREKA COUNTY.

CORTEZ MINES LIMITED.—Superintendent Welch states that during October the production was 45,000 oz.; expenses, $18,400; tons crushed, 680.

LINCOLN COUNTY.

RAYMOND MINING COMPANY.—This company, at Pioche, is building a tramway to facilitate the transportation of ore to its mill.

STOREY COUNTY—COMSTOCK LODE.

HALE & NORCROSS MINING COMPANY.—During the week ending November 19th, this mine, according to the superintendent's reports, hoisted 1,227 tons of ore, shipped to the Nevada mill 1,005 tons and milled 1,025 tons; average battery assay $30.07 per ton. They have bullion on hand, and at the mill amounting to $46,557 No changes are reported on the 300-foot level On the 1,300 level the south upraise, 100 feet south of shaft to connect with the south on stopes of 1,200 level, is now advanced 30 feet, showing ore on the top. They have

also started a new upraise 130 feet north of the shaft to connect with the north ore stopes of the 1,200 level. Have run an upraise where necessary and in the main shafts.

SAVAGE MINING COMPANY.—For the week ending Nov. 19th this mine, says the superintendent, shipped 471 tons of ore to the Rock Point mill, where 458 tons were worked, giving an average battery assay of $26.50 per ton. There is bullion on hand and at the mill amounting to $20,948. Ore is being extracted from the north drift and from N. 2 southwest drift on the 400-foot level, and from the north and south upraises from the east drift, and from the west upraises and north drift on the 500-foot level.

NEW JERSEY.

SUSSEX COUNTY.

A practical trial is to be made of the Edison magnetic ore separators at the Ogden iron mines in Sussex County, which have been abandoned for several years. Several thousand tons of ore, which lie dumped near the shafts, and were thought worthless because of their leanness, will be experimented upon. It is stated that Mr. Edison has formed a company, of which he is president, to develop the mines. New buildings are being erected for four crushers and four ore separators.

NEW MEXICO.

GRANITE COUNTY.

It is reported that a consolidation of the Aztec and Pinos Altos companies is contemplated.

SANTA FE COUNTY.

LUCKY MOUNTAIN MINING.—A charter has been granted to this company. The directors are John Borradaile, S. E. Barron, J. W. Seymour, Jr., William Lofinck, of San Pedro, and Edward Schaub, of Kansas. The capital stock is $500,000, shares $5 each. This corporation owns four claims in South Santa Fe County, two of which they have been engaged in developing since last March.

NORTH CAROLINA.

RANDOLPH COUNTY.

NEW HOOVER HILL GOLD MINING COMPANY, LIMITED.—The bullion obtained during September, weighing 93 ounces, was sold in London and realized £316 5s. 11d. The production for October was 87 ounces.

PENNSYLVANIA.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to November 23d, were as follows:

	1889. Gals.	1888. Gals.
From Boston	4,312,047	4,032,068
Philadelphia	145,271,233	122,835,858
Baltimore	7,162,147	6,516,477
Perth Amboy	15,374,304	20,198,235
New York	396,488,936	323,529,103
Total exports	569,604,267	477,111,771

UTAH.

SUMMIT COUNTY.

DALY MINING COMPANY.—Messrs. Lounsbery & Co. furnish us the following statement of receipts and disbursements for the months of July, August and September, 1889:

RECEIPTS.

Cash balance, June 30th, 1889	$431,850.90
Bullion sales, three months	54,055.20
Ore sales, three months	89,215.34
Sulphide sales (to July 31st)	108,110.37
Mine account	10,943.00
Mill account	1,691.64
	$695,866.45

DISBURSEMENTS.

Mine account	$48,126.45
Mine construction	7,287.98
Mill account	39,391.41
Mill construction, leaching works	2,182.42
General expense	3,670.97
Interest and discount	127.97
Prospecting	15,036.35
Ore hauling	5,407.69
Ore expense	5,710.47
Bullion expense	581.06
Sulphide sales (reclamation)	464.71
Dividends, Nos. 29 to 31, inclusive	112,500.00
Purchase of mining claims	7,000.00
Cash balance, September 30th, 1889	448,378.97
	$695,886.45

NOTE.—Sulphides for August and September, 73,000 ounces silver, equals approx. $67,000.00
Sulphides for October, 38,000 ounces silver, equals approx. 35,000.00
Estimated value of four lots now on hand $102,000.00

UTAH COUNTY.

HORN SILVER MINING COMPANY.—Secretary Harrison informs us that the gross product for October was $23,000. The drift on the 200-foot level of shaft No. 5 has been extended 35 feet.

VIRGINIA.

PAGE COUNTY.

BLUE RIDGE IRON COMPANY.—This company has been incorporated under the laws of the State f Virginia, with full powers to do all business in ny way pertaining to mining and smelting of res or mineral products. It may hold land not xceeding 200,000 acres at any one time. The apital stock is $300,000, which may at any time be increased to $1,000,000. Shares $10 each. The officers are: Wesley M. Oler, president; William H. Bosley, vice-president; Frank R. Biedler, secretary and treasurer. The directors are as follows: W. M. Oler, W. H. Bosley, John C. Rose, Joseph A. McKellip, David F. Kagey, Frank R. Biedler. The consulting engineer is William Glenn, of Baltimore, Md. The principal office is at Luray, Page County, Va., and the general offices at Nos. 201 Camden and 300 Sharp streets, Baltimore. The Biedler Mountain ore property, owned by the company, is located in Page County, immediately beside the Shenandoah Valley Railroad. It contains 111 acres of land lying upon the westward slope of Biedler Mountain, that being a knob on the Valley flank of the Blue Ridge. It is distant from Harrisburg, and from tide-water at Baltimore, alike, 160 miles. The ores discovered so far of the property are manganese and three deposits of hematite. The manganese deposits assay 4½ per cent. metallic manganese and 0·26 per cent. phosphorus. The hematites assay from 17·75 to 53·90 per cent. metallic iron and from 0·168 to 0·171 per cent. phosphorus.

FOREIGN MINING NEWS

CANADA.

PROVINCE OF ONTARIO.

It is reported that a coal deposit has been located beyond Sharbot Lake, on the line of the proposed Brockville & Westport Railway. Mr. Hervey, of New York, it is stated, has obtained the right to mine it. A mining engineer will make an investigation.

MEXICO.

Written for the ENGINEERING AND MINING JOURNAL by R. E. Chism, M.E.]

DURANGO.—A discovery of gold placers is reported in this State at a point not more than 200 miles to the west of the station of Torreon, on the Mexican Central Railroad. This location is rather indefinite, but the whole region to the west of Torreon is known to be more or less gold bearing, and has been intermittently worked for many years.

A surveyor running some lines through the mountains, about 75 miles west of Durango City, found an old mining camp, with the ruins of houses and a large convent. Over 100 arrastres were found grouped around several patios of immense size, overgrown with trees three or four feet in diameter. The mouth of the mine was found with immense dumps, which was sampled to run from $75 to $100 per ton. It is not unlikely that this account may be substantially true, as I myself, when living in these same mountains some years ago, heard the traditions about this old camp, which was discovered many years ago by a deserter from the Mexican army, who could never find the place again, he having stumbled on it by chance in his flight through the mountains. A company is said to have been organized to follow up the discovery made by the surveyor.

GUANAJUATO.—The gold and silver mines in the old mining camp of San Anton, which were worked by the Jesuits many years ago, have been in the hands of Col. B. F. Bivins, of Philadelphia, for the past year or two. He has done a great deal of development work on the veins, and has sold the mines in their improved state to an English company. The price is not stated. Mining work by contract is cheaper in the San Anton camp than in any other I know of in this country. The present foreman of the Bivins mines is Mr. Charles Fish, an old Colorado and Arizona miner.

GUERRERO.—A company has been organized in this State to prospect a diamond mine which is said to have been recently discovered in a mountain called the "Coronilla," near the village of Tepantitlan, in Mina County. The find is said to be in the bottom of a gulch, which is strewn with gravel brought down from the neighboring mountains. This is supposed to be the famous diamond mine of which the secret was held by General Vicente Guerrero, one of the heroes of the war for independence in Mexico. The general exhibited many fine stones to his friends, but would never tell where they came from, and the secret was lost by his death at the hands of the clerical party.

HIDALGO.—One of the greatest hits ever made in Pachuca was that of Mr. M. P. Boss, when he put up the mill on his continuous system, which has now been running several months. The demand on the capacity of the plant is so great that it will soon have to be enlarged, as there is no limit to the ore that can be obtained now that the advantages of the system have been made patent to the mine owners by a practical test on a large scale in their own camp.

It is said that an American company is bargaining for the Tres Marias, Santa Maria del Cuervo, Guadalupe del Zembo, Corpus Christi, Palma, and other mines that lie to the west of the city of Pachuca. If the trade is made these mines will be worked on a large scale and the ore treated by improved machinery.

Lately the Mining Deputation of Pachuca made a decision disposing of some water rights, which was thought to be notoriously unjust and possibly not uninfluenced by pecuniary considerations. Accordingly, the matter is being investigated by the Supreme Court of the State, which will probably make life very unpleasant for the mining deputies in case the accusations against them are proven.

The Pachuca Silver Mining Company, Limited, is an English enterprise with a capital of £25,000, of which J. W. Bawden, M. E., is manager. It owns three mines in this camp, and its prospects are reported to be very good.

The Santa Gertrudis mine, managed by Mr. Frank Rule, is producing some $80,000 worth of high grade ore a month. Its shares are quoted at $1,400 each, on which the mine pays a monthly dividend of $40. The Pabellon mine, under the direction of the same gentleman, is producing some 200 tons of ore weekly, worth about $100 per ton, according to the statements that I have heard.

The company now working the Camelia mine has run a tunnel to communicate with the Paraiso mine. Both of these mines are said to be very rich. They are located on the Vizcaina and Tapona veins, as is also the Bedencion mine with which the same tunnel communicates.

In the Guadalupe Hidalgo mine a crosscut has been opened to the north so as to afford room for stoping down the ore in the vein where it was recently cut.

At El Chico a vein has been cut in a tunnel in the Marquesotas mine which is reported to assay between 500 and 100 ounces to the ton. The Nieves mine in the same camp is producing a small quantity of ore, which is said to be increasing in quantity as the shaft grows deeper. A large pocket has been encountered in the soft part of the wide vein in the Trinidad mine which gives ore of over 1,000 ounces per ton. The Atarjea mine was in the hands of habilitators who made nothing out of it, and at length threw the mine back on the hands of the owners as entirely worthless. The owners commenced work on their own account two months ago, and have now uncovered a bunch of ore two feet wide which assays over 200 ounces per ton.

In the Cueva Santa mine, in the Santa Rosa district, a drift to the north has opened up an orebody outside of the main vein, which assays 265 ounces of silver and an ounce of gold per ton, The stock, which was a few weeks ago quoted at $6 a share, is now held at $35. Several transactions have been made at $30.

JALISCO.—In the Bolanos mine of the Eagle Mountain Mining Company of St. Louis, a large body of high grade lead ore was struck some time ago, which is now being exploited. The high water which prevailed in the rivers during the rainy season is now over, and a new smelting plant is being freighted out there, and apart of it has already been erected.

LOWER CALIFORNIA.—A short time ago eleven carloads of machinery passed through Nogales, Arizona, for the Boleo Copper Company, the French enterprise which is operating at Santa Rosalia, Lower California. The prevailing impression seems to be on the frontier that the company has a purchasing agent with a pull and a soft snap, as large quantities of machinery of various kinds have been shipped out to the peninsula, both by land and water, for the last three years.

At the Alamo camp in the Real del Castillo District, where the great excitement was last winter and spring, the dust has cleared away, and the hardy spirits who survived the boom have settled down to hard work. The placer diggings have been given up for the quartz veins, and there are now two 10-stamp mills, one of five stamps and a Wisswell mill in operation. Another 10-stamp mill will commence work in a few days, and two or three more mills are on the road. A few months ago the town could only boast of a few store tents and brush huts. There are now some 10 or 12 substantial adobe houses, built on a town site, regularly laid out, and many more tents and frame houses. There is a weekly newspaper called the *Nugget*, published in English, the majority of the population being Americans and English, with a few Frenchmen and Germans. The International mill retorted $9,000 worth of gold from a mill run of 17 days, and the Wisswell mill, belonging to Ed. Lane, cleaned up $4,000 worth of gold for a week's work. Labor is cheap, but food and supplies continue dear.

MICHOACAN.—A vein of great richness is said to have been discovered in the district of Chirangangueo, and a mining concession has been taken out for a zone which embraces the find.

The government, by authority of Congress, has established a course of study leading to the degree of Electrical Engineer in the National Engineering School (often called the Mexican School of Mines) City of Mexico. The courses now pursued in that institution, besides the new one, lead to the degree of Mining Engineer, Engineer of Roads, Ports and Canals, Industrial Engineer, and Assayer and Refiner of Metals.

On the drainage tunnel the contractors, Reed & Campbell, are actively at work with nearly 2,000 men, and there is now no doubt that the tunnel will be finished, barring accidents, in about two years from this time.

The artificial drainage of the City of Mexico by means of pumps, which was described and illustrated in the columns of the ENGINEERING AND MINING JOURNAL, August 10th, 1889, has completely accomplished the object for which it was intended. This city has passed the rainy season without any serious flooding, except where the sewers were too small to carry off the surface water.

SOUTH AMERICA.

REPUBLIC OF COLOMBIA.

COLONIAS MINING COMPANY.—At a meeting of this company held in New York recently the shareholders decided to increase the capital stock of the company to $1,000,000, consisting of 1,000,000 shares of the par value of $1. The money acquired, it is stated, will be used in further developing the property and acquiring additional claims. According to an officer of the company the mine is located in the Department of Antioquia on the eastern slopes of the Andes and near the Magdalena River. The Colonias is the only mine in the locality worked by American machinery. The present production, it is stated, is $10,000 per month. Among the company's officers and stockholders are J. M. Ceballos, Chester C. Munroe, E. Gogonza and F. G. Pieora.

PERU.

The gold mines of the Province of Carabaya, Department of Puno, which were formerly worked extensively by the Spaniards and Portuguese, but were subsequently abandoned, partly on account of the attacks of savages, and partly because of revolutions, are now exciting great interest.

This is the region described in the recent meeting of the British Association. It lies on the east side of the Cordilleras, almost directly southeast of Lima. At this meeting the travels of Engineers Rosell and Simpson, a short time ago, were described. While prospecting for a railroad route they passed through the Department of Puno, and in their report, published in Lima, they said that gold exists in this region to an unlimited amount.

MEETINGS.

Gipsy Maid Consolidated Mining Company, No. 53 Broadway, New York city, December 16th, at 2 P. M.

Harney Mining Company, at the office of C. C. Douglas, village of Houghton, Houghton County, Michigan, December 14th, at 10 A. M.

New Central Coal Company, 1 Broadway, New York City, December 10th, at 12 o'clock noon. Transfer books close December 4th and reopen December 10th.

The regular quarterly meeting of the New England Water-Works Association will be held at Young's Hotel, Boston, Mass., on Wednesday, December 11th, 1889.

DIVIDENDS.

Alice Mining Company, of Montana, dividend of 6¼ cents per share aggregating $25,000, payable December 12th. Transfer books close December 2d.

Equitable Gas Light Company, 340 Third avenue, New York City. Transfer books of the certificates of indebtedness closed from November 20th to December 3d for payment of semi-annual interest, due December 2d.

Seattle Coal and Iron Company coupons of the first mortgage bonds, due December 1st, 1889, payable at the Manhattan Trust Company, No. 10 Wall street, New York, on and after that date.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Anna, Dak.	4	Oct. 10	Nov. 15	Dec. 5	.002½
Atlas, Dak	....	Oct. 3	Nov 11	Dec. 15	.000½
Belcher	38	Oct. 17	Nov. 20	Dec. 11	.50
Bodie	11	Nov. 11	Dec. 7	Jan. 22	.25
Chollar, Nev	28	Nov. 1	Dec. 4	Dec. 24	.50
Con. Pacific, Cal.	11	Nov. 1	Dec. 5	Dec. 28	.10
Del Monte, Nev.	2	Oct. 28	Dec. 3	Dec. 26	.20
Goodenough, S. Dak	4	Oct. 25	Nov. 25	Dec. 11	.002
Gould & Curry, Nev	63	Oct. 15	Nov. 18	Dec. 11	.30
Hailstorm, Dak.	2	Oct 22	Nov. 22	Dec 12	.001½
John Duncan, Mich.	....	Nov. 2	Dec. 5	Dec. 15	.50
Locomotive	5	Oct. 17	Nov. 25	Dec. 17	.05
McDonnell, Dak.	3	Oct. 15	Nov. 20	Dec. 10	.001
Monitor, Dak.	3	Oct. 19	Nov. 26	Dec. 14	.001½
Navajo Queen	2	Oct. 23	Nov. 26	Dec. 11	.10
Nevada Queen Nev	6	Oct. 31	Dec. 4	Dec. 30	.20
N. Gould & Curry, Nev	11	Nov. 6	Dec. 7	Dec. 27	.20
North Gover, Cal.	4	Oct. 21	Nov. 19	Dec. 16	.00½
Phil Sheridan	4	Oct. 23	Nov. 26	Dec. 11	.10
Russell, Cal	5	Nov. 11	Dec. 16	Jan. 8	.05
Savage, Nev.	74	Nov. 5	Dec. 10	Dec. 30	.50
Summit	11	Nov. 14	Dec. 20	Jan. 14	.05
Trojan	18	Oct. 23	Nov 26	Dec. 11	.10
Tuscarora	2	Oct. 12	Nov. 15	Dec. 5	.10
Union Con, Nev.	39	Oct. 8	Nov. 13	Dec. 4	.25
Utah	8	Oct. 22	Nov. 26	Dec. 16	.25
Vine Spring, Cal.	1	Oct. 10	Nov. 18	Dec. 9	.15

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 488 and 489.]

New York.

FRIDAY EVENING, Nov. 29.

Trading has been light this week, but on the whole interest has been fairly well sustained, and brokers report a number of inquiries from outside sources, a feature which is always encouraging. The holiday has of course exercised the usual effect of a holiday on the market. Payment of dividends on Horn Silver and Alice, as predicted last week, has produced no important effect other than to steady values. The Committee on Mining Securities has not yet taken action on the number of applications for listing that are pending.

It is reported from San Francisco that the project for draining the lower levels of the Gold Hill mines, to which we have referred in this column, has at last been definitely decided upon by those interested, and it is said that pumping operations will shortly begin on the 1,400-foot level of the Crown Point mine, and the lode will be drained down to the 2,700-foot level, which will permit exploration for new bodies of ore. It is stated that the expense will be apportioned among fourteen companies. The market during the week for Comstock shares has been generally quiet and prices steady. Among the sales has been Consolidated California & Virginia at $6@$6.37½; Chollar, $1.65; Crown Point, $2.60; Gould & Curry, $1.75; Alta, $2.10; Exchequer, 80c.; Julia, 40c.; Mexican, $3.35; Overman, $1.15@$1.20; Ophir, $4.15; Occidental, $1.15@$1.20; Oriental & Miller, 6c.; Potosi, $1.80@$1.85; Sierra Nevada, $2.75; Savage, $1.55; Utah Consolidated, 95c.@$1; Yellow Jacket, $2.75@$2.85; Hale & Norcross, $3.15; Best & Belcher, $3.25. Sutro Tunnel Trust Certificates sold at 60c.; Comstock Tunnel stock, 21@23c., and Comstock Tunnel bonds, $38. It seems that these bonds are issued for sums of not less than $500, and for fractional parts of this amount non-interest bearing script is given. There are, of course, a number of small holders who own less than $500 worth of the bonds, and who, when they first received the scrip in exchange for their Trust certificates, supposed it bore the interest to which they are entitled, but when deliveries were made it was found without interest. This, of course, is an injustice to smaller holders, and should be remedied. It seems that the troubles of this company will never end. As has been previously stated, the Comstock mines belonging to the Sharon estate paid their royalties last month but the Consolidated California & Virginia and a number of others did not. President Theodore Sutro, of the Comstock Tunnel Company, has therefore sent a formal notice to the Consolidated California & Virginia management, stating that the Comstock Tunnel Company is the owner of all property and all franchises of any kind or nature of the Sutro Tunnel Company, and demanding payment of royalties due under the Act of Congress of 1866. In default of such payment President Sutro says the Consolidated California & Virginia Company will be held responsible for all damages resulting therefrom to the Comstock Tunnel Company.

No news is forthcoming from the Tuscarora camp. We note sales during the week of Nevada Queen at 80c.; Commonwealth at $3, and Navajo at 38c.

No transactions in Eureka Consolidated are reported; the price remains firm and unchanged.

The Amador County properties have been fairly active this week with no important developments of interest. Astoria, for reasons outlined in our last report, has quietly declined from 36c. to 13c., about the figure at which the recent manipulation was started. Sutter Creek on small sales has shown a slightly hardening tendency at 53@54c. It is rumored that before long efforts will be made to resuscitate the Hollywood enterprise, and it is also said that an assessment on the stock may therefore follow; all of which, however, is more or less indefinite at present.

San Francisco people evidently share the opinion of Eastern stockholders in regard to the management of some of the Bodie mines. The San Francisco *Report* of a recent date calls attention to the fact that although the Bodie Consolidated Company on November 1st reported having $16,440 in the treasury, and Mono reported having $18,046, each company has since levied an assessment of 25 cents a share. The *Report* says that these amounts were amply sufficient to pay the expenses of each company for some time, and that it looks as though the assessments were entirely unnecessary. No sales of Bodie County shares were reported this week.

Plymouth Consolidated is firmer, $4.50 asked, with no sales. Brunswick sold for 2c., as usual in fairly large quantities.

The Dakota stocks have maintained their usual prominence. Father de Smet has continued the advance begun last week, sales being recorded as high as 65 cents. The only tangible explanation of such an advance is the rumor which is now current that the Deadwood Terra Company will shortly compensate the Father de Smet Company for the use of the 100-stamp Father de Smet mill to the amount, perhaps, of $25,000 or less for the two years' use. There are 100,000 shares in the capital stock of the company. Messrs. Lounsbery & Co. inform us that the principal owners of both the Deadwood Terra and Father de Smet companies as yet have not decided the matter of compensation, and assert that the recent activity in the stock is simply the result of the manipulation of room traders. Homestake is firm at $9.00 bid; Deadwood Terra sold on Tuesday at $1.55. There has been little activity in Caledonia; at the close quotations were $1.40 bid. In our mining news columns we have something to say about the recent movement in this stock. Interesting figures are also given in regard to Deadwood Terra and Homestake.

The Colorado shares have been generally firm and in fair demand. We note sales of Little Chief at 34c.; Silver Cord, 65@70c.; Leadville, 11@12c.; Breece, 30c. While, as noted in this column some weeks ago, the officers of the Aspen Mining and Smelting Company say that the property has been looking better than usual for the last two months, this company, like all the others of the Aspen District at present, is confronted with a serious problem in the lack of adequate smelting facilities in Aspen itself. Of late, it is stated by the owners, the railroads have manifested an inclination to charge exorbitant rates of transportation, which has resulted in the reduction of the shipments of the ores of many of the important mines

There has also been considerable inquiry for Montana silver shares. In accordance with the rumor noted in this column last week, Alice has declared a dividend of $25,000, or 6¼ cents a share, payable December 12th in this city. The stock has been firm at $1.10@$1.25, closing at $1.15 bid. It is said, we know not with how much truth, that most of the recent purchases have been for the account of Salt Lake City investors, who are supposed to be well informed as to the condition of the property, President Joseph B. Walker and his friends being residents of that city. The mine has recently been examined by Prof. W. P. Blake, of New Haven. Moulton, for the first time in some months, appears on the active list, with small sales, at 30c.

The announcement of the 12½-cent dividend on Horn Silver has made the price of the stock rather steadier, but no notable advance has occurred. Quite large transactions are recorded from $2.25@$2.45. Secretary Harrison informs us that the net profits for September were $13,000, and that the present cash surplus of the company is $265,000.

Phœnix, of Arizona, has been very quiet. A few small sales were reported at 51c.

Silver King sold at 23c. There is a good deal of curiosity as to what will be the next move of the management of this company.

Among the copper stocks there have been sales of Tamarack at $138.25, and Calumet & Hecla at $236.25.

El Cristo has quieted down again, and traders, who were hoping to be able to take a small profit out of the stock on account of the recent firmness, now seem to be discouraged. Sales were made at $1.25@$1.10. Latterly a better inquiry and more firmness has been displayed.

Among the miscellaneous dealings we note sales of Rappahannock at 6c.; Mutual Mining and Smelting at $1.70; United Copper, $1.10.

Some weeks ago we noted that a stockholder in the late lamented Tortilita enterprise was desirous of investigating the present status of the concern. We understand that he has been fairly successsul in his quest and has unearthed some very interesting as well as instructive details of the method in which the stock was sold in this city, and of the manner in which the proceeds of sales were appropriated.

NOTES OF THE WEEK.

An interesting dispute arose this afternoon as to what constitutes a "board room lot" of bonds in the mining department. Comstock Tunnel bonds are issued for $500 each, and when Macpherson bid "for a bond" this afternoon his offer was quickly accepted by Blydenburgh, who insisted on the delivery of a $1,000 bond, claiming that under board-room rules a $1,000 bond was the accepted interpretation of "a bond." In this view he was sustained by Chairman Peters, to whom an appeal was taken, and by H. R. Lounsbery, of the Complaint Committee. Inasmuch, however, as the trading in these Comstock bonds has heretofore always been on the basis of $500 bonds, the committee on mining securities will adopt a new ruling on this point so as to admit of the negotiation of bonds of the lesser denomination.

In writing to the Committee on Mining Securities about the Comstock Tunnel scrip referred to above, President Theodore Sutro says: "I desire to state that sufficient bonds of the Comstock Tunnel Company have been delivered to the Union Trust Company to cover the amount of the scrip of the Tunnel Company. These bonds, so deposited with the Union Trust Company, bear interest at four per cent. per annum from September 1st. The scrip is exchangeable for these bonds in amounts of $500 or multiples thereof. The effect of this is that interest runs on the scrip the same as on the bonds, payable, however, only on aggregate amounts of scrip of either $500 or multiples thereof."

Boston. Nov. 27.

(From our Special Correspondent.)

The market for copper stocks early in the week was dull, but prices were very firm, and very little desire on the part of the holders to part with their stocks. The past two days there has been an active demand, owing to the statistical position of ingot, and the firm belief that still higher prices must prevail. Orders to buy to-day resulted in an advance in all the leading stocks and developed quite a demand for the small producing mines, as for those which have not as yet proved remunerative. In this latter class we look for an active movement in the near future. In fact the evidences of a genuine boom in the whole list are not wanting, and those who would profit by it must "catch on" while they have a chance.

Calumet & Hecla sold up to $240, and even that figure did not bring out much stock.

Boston & Montana was very dull early in the week at about $44@$44½. To-day it touched $46,

and buyers are more anxious to get it now than when it was selling in the thirties.

Tamarack steadily advances on very small lots, touching $145 to-day.

Quincy also advanced from $64@$70, reacting to $68.

Franklin is again coming to the front in point of activity. The product is increasing and a dividend in the near future is quite probable. Stock sold to-day at $16¼, an advance of $1⅜ over last week. We consider it a good purchase.

Atlantic also advanced from $12½@$13¼, and is in good demand, and will no doubt sell higher.

Osceola advanced from $15@$18 without bringing out much stock. Advices from the mine are of a very encouraging nature.

These stocks are all producers and have paid dividends within the past few years. With the present outlook for ingot copper they will all doubtless pay good returns to the holders on their investment.

Among the speculative class Kearsarge is one of the most promising, and will no doubt sell higher than present prices. Sales at $7¾@$8¼. Allouez is looking better and sold up to 95c.

Huron is steady at $2⅛, and National at about $3. If the present price of copper is maintained, these two mines will no doubt become active in the market.

Santa Fe has held its own during the week at 70 @ 75c., with a better demand for it to day at the latter figure.

Dunkin silver steady at 75c.; very little doing in silver stocks.

3 P. M.—Boston & Montana declined ¼ to $45¾. Franklin advanced to $16⅜. Kearsarge to $8⅛, and Osceola to $19. Tamarack sold at $1.45.

Market closed strong.

Calumet & Hecla $240 bid.

Lake Superior Gold and Iron Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

GOLD MINING STOCKS. Nov. 23.

Name of Company	Par value.	Lowest.	High.
Gravling Gold & Silver Co.	$25.00	$0.85	$0.90
Michigan Gold Co.	25.00	2.50	3.00
Peninsula Gold & Silver Co.	25.00	2.00	.90
Ropes Gold & Silver Co.	25.00	.75	2.50

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Champion Iron Co.	$25 00	$100.00	$110.00
Chandler Iron Co.	25.00	.....	40.00
Chicago & Minn. Ore Co.	100.00	.....	110.00
Cleveland Iron Co.	25.00	19.00	20.00
Jackson Iron Co.	25 00	110.00	115 00
Lake Superior Iron Co.	25 00	60.00	65.00
Milwaukee Iron Co.	25.00	4.00	6.00
Minnesota Iron Co	100.00	80.00	85 00
Pittsburg Lake Angeline Co.	25.00	131.00	135.00
Republic Iron Co.	25.00	48.00	49.00

PIPE LINE CERTIFICATES.

(Special Reported by Messrs. Watson & Gibson.)

The tendency of the market during the past week has been downward. The fear has been present that the Standard, while keeping up the premium paid on fresh oil, would lower the price of the certificates in the market, so that the total amount paid to new producers would not be so much as the statistical situation should warrant. Speculation is very narrow, and a few orders either way affect the market to an unnatural degree.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Nov. 23	109⅛	110	109½	110	145,000
25.	110⅜	110⅝	106½	106⅞	625,000
26	105¾	107¾	104⅜	106¼	763,000
27	105⅜	106⅛	104⅞	104⅞	406,000
28*	.....	.....	.....	.....	.....
29	105⅜	105¼	104⅛	105¼	330,000
Total sales in barrels					2,319,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Nov. 23	109 ⅛	110⅛	109½	109⅞	172,000
25	111¾	110⅛	106	106¾	1,539,000
26	106¾	107½	103½	106	1,793,000
27	107	107	104⅜	105¼	604,000
28*	.....	.....	.....	.....	.....
29	105	106⅛	104½	105⅛	545,000
Total sales in barrels					4,589,000

* Thanksgiving Day.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 29.

Statistics.

PRODUCTION OF ANTHRACITE COAL for week ended November 23d and year from January 1st.

	1889.		1888.
Tons of 2,240 lbs.	Week.	Year.	Year.
P. & Read. R.R. Co.	148,257	6,497,331	6,566,117
Cent. R.R. of N. J.	132,739	5,453,315	5,235,402
L. V. R.R. Co.	189,942	6,646,787	6,111,087
D., L. & W. R.R. Co.	120,000	4,705,240	6,329,964
D. & H. Canal Co.	79,558	3,435,081	4,075,865
Penna. R.R.	53,050	2,889,213	4,155,557
Penna. Coal Co.	38,285	1,241,850	1,534,153
N. Y., L. E. & W.	15,500	878 324	858,210
Total	777,331	31,747,141	34,867,355
Decrease	.....	3,120,214	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent. of the whole production.

These figures are subject to corrections for duplications.

Production for corresponding period:

1884	28,325,931	1886	29,440,949
1885	36,361,456	1887	31,044,106

PRODUCTION OF BITUMINOUS COAL for week ended November 23d and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS

	1889.		1888.
Tons of 2,240 lbs.	Week.	Year.	Year.
Phila. & Erie R.R.	2,471	77,307	59,094
Cumberland, Md.	67,104	2,747,602	3,263,242
Barclay, Pa.	*2,639	108,542	140,917
Broad Top, Pa.	10,280	316,558	332,437
Clearfield, Pa.	6,164	536,122	3,028,481
Allegheny, Pa.	16,064	732,927	718,735
Beach Creek, Pa.	*16,038	1,393,901	1,321,613
Pocahontas Flat Top.	36,414	1,542,867	1,240,577
Kanawha, W. Va.	40,000	1,651,511	1,459.295
Total	251.194	9,107,337	11,564,391

* Week ending November 21.

WESTERN SHIPMENTS.

Pittsburg, Pa	16,786	601,326	660,189
Westmoreland, Pa.	39,435	1,380,227	1,480,418
Monongahela, Pa.	4,858	343,573	358,106
Total	61,079	2,325,126	2,426,913
Grand total	312,273	11,432,463	13,991,104

PRODUCTION OF COKE on line of Pennsylvania R. R. for week ending November 23d, and year from January 1st, in tons of 2,000 lbs.: Week, 103,996 tons; year, 3,984.157 tons; to corresponding date in 1888, 3,655,452.

Anthracite.

The anthracite market continues unusually quiet and rather weak, which, being interpreted, means that coal—almost any kind of anthracite—can be purchased at prices below the schedule.

The Eastern market is especially weak, and this is accounted for by the large all rail deliveries going by Newburg and the Poughkeepsie Bridge. This coal is being offered at Lowell and other large markets in New England at from 25 to 50 cents a ton less than the seaborne coal can get to the same points. Naturally this is making some stir in the trade. It looks as if the Eastern inland markets were at last going to get coal at fair rates, for in the past the railroads charged from 2 to 4 cents a ton-mile on anthracite from the seaboard to the interior cities. The through rates by all rail are now bringing these charges down and will lessen them still further in the near future.

The production of anthracite during the month just closing will be very nearly as great as it was in October, or from one-half to three-quarters of a million tons more than the amount the companies had stated they would produce. This fact fully explains the condition of the market. It would have been far better to have stopped half a million tons short and have consumed the stocks now at tide-water, when the market would have been in a much firmer condition, and would have so remained during the balance of the year. Now the season for short production is coming on, and unless some remarkably cold weather should come, the condition of the market is not likely to be very buoyant before next year. As we have many times pointed out, the consumption of coal continues to be large, and the dullness of the market is rather by comparison with the briskness of last year than because there is but little business doing. The amount of coal absorbed last month, as we showed in these reports, indicated a very active consumption, and the manufacturing industry throughout the country is unusually active, and we believe will continue to be so for some time to come. Actual prices we quote: $4@$4.15 f.o.b. for stove, and proportionately less for other sizes.

Bituminous.

The features of this market noted in previous reports have now become quite stereotyped. The problem which is always presenting itself, and whose solution is daily becoming more urgent, is how to get cars. The cold weather increases the clamoring of buyers, but brings no increase in the supply. Fancy prices now seem to be rather the rule than exception. Sellers claim that as high as $3 f. o. b. Philadelphia, or $3.75 alongside New York, could have been obtained for good coals.

Advices from Baltimore report much disstisfaction with the car service of the Baltimore & Ohio Railroad, which, in fact, is stated to be so inefficient as to make Baltimore unpopular for shipping purposes, thus driving trade to Philadelphia, from which point it is said that even a good deal of Cumberland coal has been shipped.

Vessels would not be any too plentiful for ordinary requirements, but under present circumstances the scarcity of cars prevents complaints as to the vessel supply.

New features are constantly being introduced by various railway extensions in pursuance of the known policy of several of the leading roads, which eventually may bring about important changes in the conditions governing the competition in the trade.

The increasing prominence of West Virginia as a factor in the market is evidently well appreciated by the railroads to which that region is tributary. We condense the following from various press dispatches that have been published during the week:

The Pennsylvania Railroad has at last begun to fight with the Baltimore & Ohio for control of territory in Northern West Virginia. The West Virginia & Pennsylvania Company has surveyed a road from Rowlesburg, W. Va., to Fairchance, Pa., opening up a rich coal and timber section. A contract has just been made by which the Pennsylvania Company will build the road and control it. The new line will be parallel to and a rival to the Baltimore & Ohio's road up the Monongahela. The Pennsylvania has begun surveys on a branch from Waynesburg, Pa., to Morgantown, W. Va., tapping the oil regions of West Virginia. The Baltimore & Ohio has already a feeder in the same territory.

The railway movements in the Valley of Virginia are at present attracting a great deal of attention. The Norfolk & Western Company is surveying for a line that will give them a connection between the Shenandoah Valley Railroad at Luray and the city of Washington. It is thought that the Norfolk & Western Company is in a position to get control of the Shenandoah Valley road. The Baltimore & Ohio Company, through their valley road, are in a position for an extension to the South.

Boston. Nov. 28.

[From our Special Correspondent.]

Every one is so excited here to-day over the great fire that no one can talk of anything else, for since 8:30 A. M. property to the value of $10,000,000 has been destroyed in the wholesale dry goods district. Coming on top of the $6,000,000 fire at Lynn, on Tuesday, our community is considerably dazed. As to the coal market, I find that the week has been marked by no special events. The weather has been warm and rainy, and shippers' agents here are a little discouraged. F. O. B. prices are decidedly weak, and good coal can be had at 15 to 25 cents off circular prices. What business there is to note is entirely of a hand-to-mouth description—a few hundred tons here and there. There is plenty of all kinds of coal offering, but consumption is much lighter than usual. Those who sell to the Lynn retail trade can keep an eye out, as several thousand tons were burned in the fire there, and some of the dealers have little or no coal left.

The bituminous trade is in no better shape, because freights are not enough lower to help shippers out. There is a good demand for small cargoes, and anything afloat is picked up at full prices based, on $2.60 f.o.b. The complaints against the railroads are louder than ever, but nothing can be done about it but complain. If the weather continues mild, shippers who are now way behind will be helped considerably; otherwise, they stand to lose in some cases quite heavily. The shippers who had only a moderate business on their books are the fortunate ones this year.

Retail trade here is as flat as it ever is in November, and the dealers are in a grumbling mood quite naturally. The combination fortunately holds in good shape, and what business there is realizes a fair profit.

The receipts at this port for the week have been 44,990 tons anthracite and 16,428 tons bituminous, as against 9,428 tons anthracite and 4,710 tons bituminous for the same week of 1888. It will be noticed that the receipts for the corresponding week of last year were unusually light. Since January 1st receipts have been 1,504,145 tons anthracite and 815,290 tons bituminous.

Freights are a little easier at New York, where vessels have, in some instances, been obtained at $1; but the range is $1@$1.15. At Philadelphia, $1.40@$1.50 still rules, and at Baltimore $1.50 is the nominal rate. The dispatch at Baltimore is still abominable.

Buffalo. Nov. 27.

(From our Special Correspondent.)

That mild weather is not conducive to activity in the anthracite coal trade, at retail especially, has been fully illustrated during the past week from the dullness which has prevailed among dealers. No changes to note in quotations, and no indication of doing so December 1st.

The bituminous coal trade quiet, and prices without variation. The heavy rains for several days hindered transportation and added to the trouble of the scarcity of cars, which was the prevailing cry before said heavy rains occurred. However, the movement has been expedited somewhat for 48 hours past, and some immediate demands for fuel have been filled. The quotations remain unchanged.

The drilling for new wells for natural gas here is proving very successful. Another came in this week which is 965 feet in depth, and gas flows at the rate of 500,000 cubic feet every 24 hours at least calculation; but it is considered good for a million when all preliminaries are put in and gauged ready for lighting.

With the exception of four loads, the shipments by lake of coal for the past week were to Chicago and Milwaukee. Brokers say that chartering is about over for the season, although an occasional contract may be expected. There are yet many vessels here that have cargoes engaged, but at least 30,000 tons of coal would be required to fill them and that quantity is not on hand at the trestles and chutes, so that the owners are much disconcerted with the prospects. Insurance ceases on Saturday. Weather fine and favorable for navigation until yesterday; to-day, heavy snow and sleet around lakes.

The shipments of coal from this port by lake from Nov. 21 to 26, both days inclusive, 48,150 net tons, namely: 31,700 to Chicago, 10,800 to Milwaukee, 1,800 to Duluth, 2,530 to Toledo, 800 to Gladstone, 120 to Marine City, and 400 to Saginaw; total for the season to date 2,145,875 net tons. The rates of freight were as follows: 75c. to Chicago

Milwaukee and Duluth; 50c to Saginaw and Toledo; and on contract to Gladstone.

Receipts by canal of coal for third week in November, 2,846 net tons; shipments 223 net tons.

Pittsburg. Nov. 27.

The Pittsburg Southern Coal Company, composed of the nine largest coal firms in this city, on the 26th inst. cut the price of coal delivered at New Orleans 4 cents per barrel. This is an unprecedented reduction, and was made, it is said, to prevent the formation by the smaller operators of a competing company.

FREIGHTS.

Southern Pig-Iron Freight Rates.—The Queen and Crescent route, via the Alabama Great Southern and the Cincinnati Southern Railway, has issued a rate sheet on pig iron, which went into effect on November 28. It covers shipments from the Tennessee and Georgia furnaces and from those in the Birmingham, Sheffield and Anniston districts, Alabama, to points North, East and West. The rate is $3.51 from Dayton and Rockwood, and $3.86 from the Alabama coke furnaces to Harrisburg, Pa. It is $3.90 from Dayton and Rockwood, $4 from Rising Fawn, and $4.45 from Trussville to New York and Philadelphia.

METAL MARKET.

NEW YORK, Friday Evening, Nov. 29.

Prices of silver per ounce troy.

Nov	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	Nov	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
23	4.84½	44¼	96⅛	27	4.84½	44*	95⅞
25	.....	44⅜	96⅜	28†	.....	....	....
26	.....	44⅜	96⅜	29	4.84½	44*	96

*44 3-16. †Thanksgiving Day.

After a sharp advance at the beginning of the week to 44⅛d., the silver market developed sudden weakness on Wednesday, falling to 44⅜ nominal. The fall is due to withdrawal of orders in London for India and Japan. The market closes steady with a better tendency.

United States Assay Office at New York reports total receipts of silver for the week 80,000 ounces.

Foreign Bank Statements.

The amount of bullion withdrawn from the Bank of England on balance Thursday was £100,000. The bullion in the Bank of England has incressed £371,000 during the past week. The proportion of the bank's reserve to liability, which last week was 40·94 per cent., is now 43·33 per cent. The weekly statement of the Bank of France shows an increase of 75,000 francs gold and 200,000 francs silver.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked
Trade dollars	$ .75	$ —
Mexican dollars	.76½	.77½
Peruvian soles and Chilian pesos	.73	.74½
English silver	4.83	4.88
Five francs	.94	.95
Victoria sovereigns	4.84	4.88
Twenty francs	3.88	3.92
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.75
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.65
Ten guilders	3.96	4.00

Copper.—The movement toward higher values has not only continued, but has gathered new force during the week just past, and the tone of the whole copper market is decidedly strong. It may be that the amount of business transacted for a few days past has been less than previously, but this has been caused by the reluctance of sellers to offer rather than from any scarcity of buyers, and the prices of all descriptions are higher again. In Lake copper there is hardly anything obtainable for immediate delivery, and for December and January delivery the quotation is now 14c. per pound. The quotations for casting kinds have been somewhat irregular, as was to be expected, and some of the inferior brands may still possibly be obtainable at 12c., but all the best brands are now held for 12½c.

At the prices now ruling in the domestic market no further exports are possible to Europe, as prices here are above the level of the European values, and the quantities now being exported are consequently on account of previous contracts at lower prices.

Early this week some reports came from Butte City regarding the outbreak of a fire in the St. Lawrence mine, which adjoins and connects with the Anaconda mines, and it was feared that this might lead to some interruption of production in that district. The reports say the fire occurred in the crosscut on the 500-foot level of the St. Lawrence mine.

The *Butte Miner* says "orders were given by Supt. Mike Carroll to bulkhead the drifts and close up the shafts of the Anaconda and St. Lawrence mines. The drifts of the latter as far down as the 500-foot level were bulkheaded, but in the Anaconda the heat was so fierce as to negative any attempt to descend below the 400-foot level, and accordingly the shaft was boarded over at that level. The connecting drifts between the two mines were securely closed at the St. Lawrence exit and all draft cut off. It was hoped to smother the fire in this way, but later the confined gas exploded and forced the bulkheads out, thus giving the fire access to all the levels, where it may burn for weeks."

The London market has also become much stronger, and a marked improvement in values has again to be reported. For Chili bars and G. M. Bs. the comparatively high point of £50 was touched during the early part of the week, but that figure was not quite maintained all the time. The latest cable quotations to hand to-day are again up. We quote £50@£50 5s. spot and three months.

Our advices are to the effect that the legitimate consumptive demand from all sides continues very good, and speculation is also exceedingly active. For refined sorts we have to quote: English tough, £52@£53; best selected, £52@£54; strong sheets, £59@£60; India sheets, £55@£57; yellow metal, £64. Sales of Anaconda matte are reported at 9s. 9d. during the week.

A Paris dispatch says: "The directors of the old Comptoir d'Escompte have offered the shareholders 24,000,000 francs as a compromise. Chairman Hentsch says that the assets have a guaranteed value of 1,500,000 francs, and will satisfy all claims. The shareholders will meet December 28th to consider the offer. The Tamarack Mining Company has lost an action for damages against the Comptoir d'Escompte and the Societi des Metaux for breach of contract, on the ground that the securities given were not in accordance with the Comptoir's statutes.

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

To Liverpool—	Copper Matte.	Lbs.	
By S. S. Olbers	287 bbls	224,100	$10,009
To Liverpool—	Copper.		
By S. S. City of Berlin	45 casks	56,000	5,987
" " "	755 pigs	224,948	23,700
" " "	138 bars	59,540	6,000
To Hamburg—			
By S. S. Wieland	32 bars	.....	3,500

Tin.—The tin market has been rather quiet in tone, with prices pretty steady, and without any material alteration. The shipments to consumers during the present month have been exceedingly heavy, and of the large quantities falling due at the end of the month the greater portion was shipped immediately on arrival. We quote spot at 21·40; December, 21·35; January, 21·35; Febuary, 21·35.

In London the fluctuations have been more important than here, and early in the week the quotations there eased off to £95 12s. 6d. spot, but the latest closing prices are higher again. £96 5s.@£96 7s. 6d. spot and three months, being nearly the same as at the close of last week.

Lead.—A decidedly firmer feeling is apparent in the lead market, and the low prices recently ruling have evidently attracted the attention of a good many buyers. A few hundred tons changed hands slightly below $3.80, but at this price nothing more is now obtainable. The Western smelters are not offering at present, and we have to quote to-day $3.85 to $3.90.

The London market has developed great strength during the week, and prices have risen considerably, the latest quotations being for Spanish lead £14 15s. and for English £15.

The St. Louis Market.—Messrs. John Wahl & Co. telegraph us as follows: Our lead market is dull, and prices have a downward tendancy. Values are nominally 3·60c.

The Chicago Market.—Messrs. Everett & Post telegraph us as follows to-day: Lead has ruled steady to firm during the week, and values are higher. Sales foot up about 300 tons, mostly for near-by delivery. We call the market at the close 3·65@3.70c.

Spelter is also much stronger. The smelters are now holding firm at 5c. at St. Louis, and we have to quote the New York prices at 5.30@5.35, at which prices some sales are reported. The London market is very strong at £22 15s. for ordinaries and £23 for specials.

Antimony.—While no change is to be reported in quotations there is almost an absolute dearth of supplies on the spot; and in spite of high quotations orders keep coming in regularly, which can only be filled at full prices. We quote Cookson's, nominally, 30c. and Hallett's 20¼@20½c.

Nickel.—The latest asking prices are 70@80c. per pound, according to quantity. The market remains without feature.

Quicksilver.—A feeling of quietness mingled with firmness is observable in this market. Prices are steady and unchanged at £9 15s. in London and 66c. per pound in New York.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, November 29.

American Pig Iron.—This market is gradually assuming the quiet aspect usual at this season, but retains an undertone of unmistakable strength and firmness. Furnaces North and South are busily engaged in making deliveries to consumers, and the latter seem to have contracted for all the iron they require during the present year and possibly for a part of January. As to prices for next year's contracts, there is still a good deal of indecision. Some indication of the tendency of the market, however, is afforded by the announcement that the Tennessee Coal, Iron and Railway Company has advanced its price for No. IX. foundry iron to $16 at furnace, which is equivalent to about $20.25 delivered here. The Sloss Iron and Steel Company quotes nominally for March delivery $17 at furnace, but these quotations are looked upon as purely nominal, the furnace managers being apparently reluctant to accept any more business at present. There is a good deal of speculation as to the opening prices of President Clark of the Thomas Iron Company, and the publication of these figures will doubtless establish the standard of many of the sellers, even although the Thomas Iron Company adheres to its familiar methods of charging its customers only the market price throughout the year, without regard to the figure at which the contract was originally entered

An event of no little significance is the consolidation of several important Alabama furnace companies which has just taken place. We are informed that the De Bardeleben Coal and Iron Company at Bessemer, Ala., the Bessemer Steel and Iron Company of the same place, and the Eureka Furnace Company, are known to be definitely included in the consolidation, and possibly the Trussville Furnace of the Birmingham Furnace and Manufacturing Company, and even the Mary Pratt Furnace, may be included later on. The consolidation of the first three companies, however, which is assured, will have seven furnace stacks in blast with a daily capacity of from 800 to 1,000 tons of pig iron, in addition to which, we understand, it is proposed to immediately erect two more stacks. These enterprises are all controlled by Mr. De Bardeleben. It is apparent that this enterprise will hereafter be a powerful factor in the market, and it is also significant in that it illustrates the tendency of the Southern iron trade toward the consolidation of the existing interests into one or two hands. As it is, the Sloss and Tennessee companies, and the consolidated De Bardeleben Company, control the greater part of the Eastern business of the Southern producing districts, and it is not improbable that eventually they may so arrange among themselves as to agree upon a certain uniform price. In addition to this it is still expected that the Southern Iron Company the enterprise of Mr. John M. Inman and his friends, to which we have frequently referred in these columns, and which was designed to include a number of important Tennessee charcoal furnaces will secure control of nearly all the charcoal furnaces, though some of its purchases are certainly not characterized by business prudence.

The Southern furnaces undoubtedly are advantageously situated in point of having their own coal and ore supplies near together, being thus independent of the prices of the ore sellers.

There is still a good demand for forge irons. We learn that a contract has recently been placed for 20,000 tons of gray forge of a Lehigh brand, on the basis of $17.50 delivered at tide-water.

Prices shows no material change. On the spot, small sales have been made at fancy prices, probably at $19.50 for No. 1 X, but as above noted for forward delivery quotations are unsettled as yet.

Scotch Pig.—Asking prices for the leading Scotch brands in New York are stationary at the figures last named, but latterly the Glasgow market has shown rather a weakening tendency, and local authorities believe that before long, with the suspension of shipments to continental ports on account of the closing of navigation on the Baltic, there may possibly be a further decline in Scotch pig. Quotations for Glasgow warrants by cable to-day to the Metal Exchange are 61s.

Spiegeleisen and Ferro-Manganese.—There have been small sales in this line and prices show a gradual stiffening, but otherwise no notable features have developed. For spiegeleisen, 20 per cent., $35@$37, depending upon quantity and date of shipment, are quoted, The latest asking prices for ferro-manganese, 80 per cent., are from $95@$100, the latter figure being for limited supply on spot and the former for prompt shipment.

Billets, Slabs and Rods.—There is no change in the situation in this line. For foreign wire rods $53@$54 is still asked. American mills continue to quote for business at $50 at seller's mill, but it is believed that a firm offer of $49.50 in some cases would now command quite a quantity of rods. Quotations for nails: Slabs and billets are unchanged at $35, and shell slabs are held at the usual advance.

Steel Rails.—As intimated in this column last week, the advanced quotation of the Eastern mills is as yet rather nominal, and it is said that even during the present week sales have been made at least $2 per ton less than the figure agreed upon at the meeting of the sales agents last week. As yet, however, there has been no important business to test values, and we may quote nominally from $33@$35, depending upon quantity, buyer seller, etc.

Structural Iron and Steel.—A number of new inquiries for architectural work are in sight, but we learn of none of importance that have been closed during the week under review. It is said that a number of the principal roads are contem-

plating an early increase in their freight car capacity on account of the great press of freight traffic during the last few months, and bar iron makers are consequently looking forward with eagerness to the disposition of a number of large orders.

The Pennsylvania road has already placed a contract for a large number of freight cars, and it is now said that the Vanderbilt interests will shortly be in the market for the same purpose. The latest quotations in detail are as follows: On wharf, bridge plate, 2·30c.; iron angles, 2·25@2·35c.; iron tees, 2·80@2·85c.; steel angles, 2·35c.; beams and channels on wharf, 3·1c.

Steel plates on wharf: Tank and ship, 2·6c.; shell, 2·8c.; flange, 3@3·1c.; fire-box, 4@4·1c.

Iron plates on wharf: Common tank, 2·25c.; refined, 2·35@2·45c; shell, 2·5@2·6c.; flange, 3·5@3·7c.; extra flange, 3¾@4c.

Bar iron at mill is quoted at 1·8c. for common and 1·8@1·9c. for refined. Deliveries from store are quoted as follows: Common, 2·1c. base; refined, 2·2c. base; "Ulster," 3@5¼c.; Norway bars, 4c.; shapes, 5c., and Norway nail rods, 5½c.

Merchant Steel.—Since our last report the only features of interest in this line have been a gradual hardening in price on the lower grades of steel, particularly open-hearth, machinery, spring and tire steel It is believed that the prices are uniformly about one-quarter of a cent a pound higher than those last quoted. The latest asking prices are as follows: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2¾c.; open-hearth spring, 2¾c.; tire steel, 2¾c.

Pipe and Tubes.—Rates of discount on wrought-iron pipe remain as follows: Butt welded, plain and tarred, 50 per cent. discount; galvanized, 12½ per cent. discount; lap-welded, plain and tarred, 62½ per cent. discount; galvanized, 50 per cent. discount. A discount of 57½ per cent. is allowed on boiler tubes of 2 inches and larger, and 52½ per cent. on 1¾ inches and smaller.

Cast-iron pipes remain at $25@$28, according to size.

Rail Fastenings.—This week asking prices show a wider variation than at the time of our last writing, but withal the tendency appears to be an advancing one. An inquiry for spikes this week brought forth quotations of 2·35c. delivered at Philadelphia. We quote as follows: Spikes, 2·25c.; angle fish plates, $2·15@2·25c.; bolts and square nuts, 3c.; hex. nuts, 3·25c.

Old Material.—Consumers are still drawing from the stocks laid in some time ago at lower figures, but holders of old iron rails show no sign of weakening in their prices, and in fact, it is said that on last Saturday an offer of $26 for 500 tons of old T's was refused. Many of the rails now in store were purchased some time ago, and in some cases advances have been made on them; naturally the holders desire to take a fair profit over all costs. For T's we quote nominally $25 to $26.50; No. 1 scrap iron is quoted at $24.

Louisville. Nov. 27.

(Special report by Hall Brothers & Co.)

Buying during the past week has not been in such large quantities as during the previous week, for the reason that the larger concerns made their heaviest purchases then. There have been transactions ranging from 1,000 to 3,000 tons for delivery at various points, and inquiries are out now for further round quantities, but the furnaces are offering rather sparingly, and in consequence a number of round orders at full figures have been declined by some of them; certain grades of charcoal iron have been in good request. The general features of the market remain much the same, with a strong probable further advance.

Hot Blast Foundry Irons.		
Southern Coke	No. 1	$18.50.
" "	No. 2	18.00.
" "	No. 3	17.50.
Mahoning Valley, Lake ore mixture		20.00.
Southern Charcoal	No. 1	$18.50@ 19.00.
" "	No. 2	18.00@ 18.50.
Missouri "	No. 1	19.50@ 20.00.
" "	No. 2	19.00@ 19.50.
Forge Irons.		
Neutral Coke		17.00@ 17.50.
Cold Short		16.25@ 15.75.
Mottled		15.50@ 16.00.
Car Wheel and Malleable Irons.		
Southern (standard brands)		23.50@ 24.25.
" (other brands)		19.50@ 20.00.
Lake Superior		22.50@ 23.00.

Philadelphia. Nov. 29.

[From our Special Correspondent.]

Pig Iron.—Scarcely any new business has been done this week, and even in the line of inquiry very little is to be said. Nearly all of the larger buyers refuse to make any purchase at the figures now named. Only a few small foundry buyers have been making any provision whatever. No. 1 foundry is $19@$19.50, with perhaps a dozen brands at $18.50, and No. 2 is nominally $18, but less might be taken in case a large buyer concluded to talk business for February. It is probable that No. 2 iron will weaken, as salesmen say that most of the large consumers of No. 2 have their contracts all placed for a month or two. It is probable that there will be a large amount of business done in mill irons in December, as the car builders are just about booking a large amount of work, and they are in the habit of covering their contracts quickly. Forge iron is $17, with a few brands at $17.50. There is a disposition among some makers to mark prices up a little higher, but the brokers whose advice is frequently sought and followed are opposed to such action at present.

Muck Bars.—While muck bars have not weakened, quotably, at least, no business has been heard of since Monday above $29.50.

Blooms.—While quotations on blooms have not declined, a few lots have been offered and taken at minimum prices. Nail slabs were sold at $35 for winter delivery. Manufacturers of late have shown a little more willingness to meet the views of buyers; but this should not be taken just now, at least, as evidence of any weakness in the market.

Merchant Bar.—Merchant bar in car lots is now generally quoted at 2 cents, but there have been some sales at 1·90c. Car-builders' iron sold at 1·75@1·80c. A1 makers are endeavoring to hold the advantages they have secured, and the iron trade of this State is certainly in a better position to do so than for years

Nails.—Some buyers endeavored this week to break the market by offers of $2 for large lots of iron nails, and while they have not yet bought they are not quite confident that they will be able to crowd prices down to that point for the amount of nails they want. There is no cutting of prices in nails, but an enormous amount of nail cutting is going on just now. There is a strong demand from New England points. Steel nails are selling well at $2.30.

Skelp Iron.—Only one transaction was reported this week in skelp. Asking price, 1·90c. for grooved.

Wrought-Iron Pipe.—The mills are completing a good many large early fall orders. But little new business has been offered. Enough promises have been made to keep mills running. Most pipe mills have a good deal of stock on hand, and are therefore not obliged to buy much skelp at present.

Merchant Steel.—All users of merchant steel are buying for the future. Some large users of merchant steel have a winter's work ahead of them, but are not buying more than four or six weeks' supplies ahead. So far as is apparent on the surface, the full October prices on all grades of steel are being paid.

Plate and Tank Iron.—The only change in the market over a week ago is shown in a disposition among two or three large manufacturers to drop a little on prices for heavy orders, where the buyers are not in need of early deliveries. Manufacturers are disposed to take business of this kind at a little less. Ordinary plate is 2·20@2·30c., but small buyers are paying more. Flange iron is very strong at 3·25c. The shop demand is good, but manufacturers think it rather strange that consumers are so careful in their buying, in view of the possibility of higher prices.

Structural Iron.—The only inquiries this week are for bridge plate from bridge builders and warehouse builders. Most bridge builders know the position of the structural iron makers pretty well, so that there is not as much correspondence going on in reference to new business as there was a few weeks ago. Angles are 2·30c.; tees, 2·70c.; beams and channels, 3·10c.

Steel Rails.—Rumors are again current referring to the possibilities of large contracts in December. It is stated that some of the new business will be taken at $33, but rail-makers decline to indorse this quotation. For small lots $35 is the asking price.

Old Rails.—Old rails are $25@$26 at tidewater.

Scrap.—Parties who are wanting scrap find the best Jersey City quotations for No. 1, $23.50.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Nov. 29.

Heavy Chemicals.—There is a good deal of speculation as to whether the market for caustic soda and bleaching powder will long remain an open one after the advent of 1890. At present it looks as though the collapse of the associations was final, and also that lower prices, at least for bleaching powder, are in store. In this event it would appear that a higher value must necessarily be attached to caustic soda, and perhaps to soda ash, in order to compensate the makers for the losses sustained on the bleach.

Another subject of interest is the changes that will probably be made in the agencies in several important brands of bleaching powder of this market next year. It is understood that the agents of Brunner, Mond & Co. will also control the sale of Hay, Gorden's and Pilkington's. It is also rumored that some changes are to be made in the selling agencies of the Atlas, and possibly of the Mathieson brands. There is a good deal of talk as to the price at which contracts for next year can be secured; the only definite transactions that we know of have been made at from $1.55 to $1.65. On the spot, bleaching powder is quoted at about $1.72½, and for prompt steamer shipment, $1.67½ @$1.70.

Caustic soda continues rather easy. For the higher tests, 70 and 74 per cent., the ruling quotations are $2.30@2.35 in round lots for shipment. For small lots, ex store, $2.40 would probably have to be paid.

The demand for soda ash and alkali continues large and very strong. Prices are firm and unchanged. For carbonated soda ash, 48 per cent., $1.40@$1.50 is quoted. For B. M. alkali, 48 per cent., $1.50@$1.55 is asked, and for 58 per cent. $1.37@1.45 are variously quoted. The supply on the spot is very light, indeed, and many consumers have been obliged to purchase from second hands.

Caustic soda ash is sympathetically firmer. For small lots, ex store, $1.37½ is quoted, but large quantities for prompt shipment can probably be obtained at $1.25.

While the prices of English sal soda remain firm, the bulk of the business seems to be taken by American makers at from 90@95c. per pound. In some quarters it is claimed that the use of sal soda is decreasing on account of the growing popularity of crystal carbonate of soda, which, it is claimed, has over twice the efficiency and purity of sal soda, and sells at $1.65@$1.90.

A press dispatch says that the striking green glass bottle blowers of Baltimore have issued an address to the public which indicates that the lockout in all the Eastern districts is likely to continue through the winter.

Acids.—On the whole, the New York acid manufacturers seem to have had sufficient reason for a sincere enjoyment of their holiday this week. Wednesday's meeting of the New York Chemical Club was quite satisfactory. Of course, a number of questions of detail are as yet unsettled, but there appears to be no thought of anything that will prevent a final consummation of the plans now under consideration. There is a good deal of curiosity in the trade outside of those who are present at the executive meetings of the conference as to what form of combination will be adopted. No one believes with the present popular prejudice against trusts that anything of so radical a nature as is expressed by this odious word is intended. The general impression seems to be that under the guise of an incorporated club the necessary agreements will be entered into. At present, however, this is more or less speculative, and for a while there must be ignorance as to the links in the chain which the manufacturers have forged for their mutual protection.

Trade continues quite good, and in some quarters it is reported even better than at the time of our last writing. Quotations remain at scheduled rates.

Fertilizing Chemicals.—An increase in inquiry indicates that some of the makers are beginning to prepare for the spring trade, but as yet the business accomplished has not been of large proportions, and values continue rather weak. Asking prices are quoted as follows:

Azotine, $2.05@$2.12½; dried blood, city, low grade, $2@$2.05; high grade, $2.05@$2.10. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, $20.50 per ton, and low grade, 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, $19. Fish scrap, $21@$21.50 per ton, f. o. b. factory. Sulphate of ammonia at $3.15 per cwt. Concentrated tankage, $2@2.05. Refuse bone-black, guaranteed 70 per cent. phosphate, $20 per ton. Dissolved bone-black is 90c. per unit for available phosphoric acid, and acid phosphate 79@80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26.

Charleston rock, undried, $5.75 per ton; kiln dried, $6.75@$7 per ton, both f.o.b. vessels at the mines. Freights by sail from Charleston to New York, $3@$3.25 per ton. Charleston rock, ground, $11.50@$12, ex-vessel at New York. Very little ground rock comes to this market at present as most of the Northern makers now have facilities for grinding the crude rock themselves. Most of the quotations for ground rock are somewhat nominal. As the coastwise steamers are nearly all engaged in carrying cotton and other materials, ground rock is brought here by sailing vessels, and in order to obtain any supply, it is said to be necessary to purchase a whole cargo for which $11 per ton is quoted.

There continues to be a fair trade in double manure salts at $1.20 on the spot on the basis of 48 per cent. potash, and $1.15 to arrive.

Muriate of potash.—Arrivals of 500 tons are reported The syndicate's sales agents say that stocks are decreasing, and that the bulk of current receipts is going into consumers' hands. Schedule prices are unchanged.

Kainit.—So far as can be learned, nothing is now offered on the spot. For December shipments, $10 per ton foreign invoice weight is quoted.

NOTES OF THE WEEK.

The fertilizer trade is now represented on the Committee on Permanent Organization of the World's Fair of 1892 by the President of the Fertilizer Exchange.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Nov. 29.

Bricks.—The market for common "hards" has shown a weakening tendency. The weather continues to upset all calculations of sellers and manufacturers, and converts what would otherwise be an active market with a very liberal demand into one of extreme sluggishness, burdened by oversupply. Shipments are received with regularity,

and at all times there is more than enough in the market to meet current inquiries. The market has not, therefore, the firmness which is usual at this period, and on this account dealers display little anxiety to lay in supplies for the winter. It is said, however, that a number have covered their wants pretty thoroughly. There is no talk of Long Island stock as yet, but plenty of brick is coming forward from all other sources of supplies. The top price obtainable for the best qualities this week is 12½@25c. less than was asked seven days ago. We learn of nothing that has brought more than $7 during the week, and the bulk of the trading has been done from $6.50@$7. Up-rivers are quoted from $6@$6.75; Jerseys at from $5.50@$6.50, the latter figure being for exceptionable qualities of South rivers. Pales are slightly easier. We quote from $3.25@$3.75.

Cement.—In this market there has been very little change since our last report, and the supply and demand remain in about the same relative positions. Among the Rosendale makers there continues to be some discussion of the combination idea, but thus far nothing definite has resulted. As was pointed out in an interview with a prominent manufacturer in this column some weeks ago, the manufacturers of Rosendale cement possess all the advantages of a natural monopoly; but, nevertheless, the lack of harmony among the 12 or 13 makers of this district is so noticeable that the formation of a combination is extremely problematical.

Lime.—The demand continues to absorb current receipts. Prices are unchanged from the schedule figures. There is much complaint, particularly among Maine shippers, of the scarcity of vessels. The high rates obtainable for lumber and stone freights at present has taken away a number of vessels from the lime trade, and moreover the coastwise fleet at this time is much lighter than usual owing to a number of losses of vessels during the frequent storms of the year. This scarcity, therefore, hampers shipments of lime, and it is said that on this account four manufacturers have concluded to suspend work for the year. This will mean putting out from 12 to 15 kilns. While this explanation is put forward by Knox County makers, some of the local rivals are inclined to think the suspension is more a matter of policy than of necessity. However this may be, the fact remains that the market during the year has been very judiciously controlled by the Knox County Association, among which, of course, are the Rockland, Rockport and Thomaston makers.

Roofing Slate.—Nothing new has developed in this line. The recent large purchases and proposed further development of slate lands in Northampton, Pa., are attracting a great deal of attention, and it is apparent that this district next year will be even a more powerful factor than it has been in the past. Local sellers of slate are inclined to attach little importance to the Southern slate deposits, to which we called attention last week in this column. They say that the character of the slate is such as to unfit it for many uses, and that it will not seriously compete with the Northern product.

CONTENTS.

IMPORTS AND EXPORTS OF METALS AT NEW YORK NOVEMBER 16 TO NOVEMBER 23, 1889, AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co		170
Downing & Co., R.F	23	51
Hendricks Bros		28
Lamarche's Sons, H.		6
Lewisohn Bros		84
Naylor & Co	28	425
Total	51	766
Corres. date, 1888		1,242
Nickel.	Lbs.	Lbs.
McCoy & Sanders		11,240
Total		11,240
Corres. date, 1888		138,166
Antimony.	Casks.	Casks.
Total	1,148	2,506
Corres. date, 1888	155	2,696
Pig Lead.	Lbs.	Lbs.
Bruce & Cook		111
Caswell, E. A		10
Erie Dispatch		9
Foley, E		43
Henderson Bros		11
Hendricks Bros		78
Total		262
Corres. date, 1888		510
Tin.	Tons.	Tons.
Abbott & Co., Jac	55	55
Amer. Metal Co		1,269
Bidwell & French		1,284
Bruce & Cook	7	40
Bursley, Ira		75
Carter, Hawley & Co		46
Cohn & Co., A		12
Crooke S. & R. Co		10
Crooks & Co		375
Davol & Son, John		29
Hendricks Bros		194
Herold, Emil		20
Knauth, N. & Kuhne		10
Lehmarer, S. & Co		177
Mendel & Tompkins		1
Muller, Schall & Co		960
Naumann, F		2
Naylor & Co		1,815
Nissen, Geo		73
Phelps, Dodge & Co		3,060
Pope, J. E., Jr		293
Schmarer & Co		11
Schreider, J. & Co		10
Thomsen, A. A		151
Thomsen, D		196
Townsend, J. R		135
Unnamed		15
Wheeler & Co		1
Total	62	10,209
Corres. date, 1888	1,465	11,155
Tin Plates.	Boxes.	Boxes.
American MetalCo		477
American MetreCo		620
Brown & Co., V. H		350
Bruce & Cook	4,918	80,361
Byrne & Co., J		8,392
Central Stamp. Co	616	75,198
Coddington & Co	5,484	145,324
Cohen, S. M		272
Cohn & Co., A	1,357	34,698
Con. Fruit Jar Co	3 5	2,387
Cort & Co., N. L	2,965	147,300
Corbier, F. & S	1,061	6,790
Crooks & Co	2,097	77,387
De Milt & Co	699	14,192
Dickerson, V. D	8,569	329,283
Downing & Co		366
Erie Dispatch		24
Fenton, D. U	383	5,390
Foley, E		74
G. L. N		75
Holder & Herrick		271
Iron Clad M. Co		283
Ismay, J. B		500
Lalance & G	384	7,569
Lazard Bros		2,356
Lombard, Ayres		3,000
Merchant & Co	1,139	25,885
Mersick & Co	630	12,226
Morewood & Co		7,568
Mulholland & H		767
Newell Bros		294
Payne & Son		313
Phelps, Dodge & Co	17,531	605,987
Pratt Mfg. Co	312	206,392
Sanders Bros		479
Shepherd & Co		26,292
Somers Bros		1,356
Stillwell, G. H		325
Taylor Co., N. & G	150	2,432
Thomsen, A. A	5,206	156,508
Warren & Co., J. M		4,134
Wheeler & Co		18,719
Whittemore & Co	1,319	35,579
Wolff & Reesing		8,314
Total	53,746	2,042,188
Corres. date, 1888	153,716	1,588,020
Pig Iron.	Tons.	Tons.
Baldwin, A		766
Bartlett, N. S		1,200
Crocker Bros	200	6,500
Crooks & Co		500
Drummond, McC. & Co		3,565
Henderson Bros	200	3,416
Godwin & Son, A. G		390
Irvin & Co., R		300
Lilienberg, N	350	35
Martin, W. T		200
Naylor & Co		50
Page, Newall & Co		469
Perry & Ryer		125
Pierson & Co		500
Pope, Sons & Co		250
Sheldon & Co., G. W		200
Stetson & Co		5,650
Topper & Beattie		100
Walbaum & Co		275
Whittemore & Co., H		50
Williamson & Co	100	3,900
Total	850	29,794
Corres. date, 1888	1,505	30,154
Steel Sheets, Billets, Forging, etc.	Tons.	Tons.
Abbott & Co		2,450
Ames, W. T		303
Austin & Co		30
Baldwin Bros. & Co		15
Belcher, H. W		95
Boker, C. F		131
Carey & Moen		118
Carter, G. F		200
Coddington & Co		24
Crenshaw, Hugh		27
Crooks & Co		292
Cortis, R. J		408
Curran, J		5
Dana & Co	303	14,846
Downing & Co		171
Erie Dispatch		40
Galpin, S. H		497
Hugill, Chas		95
Ismay, J. B		174
Lalance, & G		106
Lazard Bros		6
Leng's Sons, J. S		114
Lublin & Estey		7
Lundberg, G		51
Mersick & Co		5
Milne & Co	58	3,065
Montgomery & Co		5
Naylor & Co		2,750
Newton & S		35
Oelrich & Co		389
Pierson & Co		323
Pilditch, F. S		75
Power, C. W		36
Prosser, Thos		496
Roebling's Sons		301
Schulze & R		13
Standard Oil Co		222
Stetson & Co		11
Strouse & Co., M		25
Temple & L		15
Wagner, W. F		373
Wallace & Co		5
Wetheral Bros		2
Whitney & W		30
Wiel Elie		44
Wiell & Co		7
Williams, W		73
Williams & W		95
Wolff, R. H		347
Wright, P. & Son		4
Total	361	27,961
Corres. date, 1888	5,201	22,482
Bar Iron.	Tons.	Tons.
Abbott & Co., J		3,512
Bacon & Co		1,334
Dana & Co		25
Downing & Co		659
Froment, F		10
Fuller, Dana & Fitz		23
Haines, C. A		2
Holt & Co., H. N	100	374
Jacobus, E. G	13	35
Lang & Co		3
Lilienberg, N		8
Lundberg, G	200	1,793
Lundell, C. G		160
Merchants' Dispatch		15
Milne & Co		2,455
Muller, Schall & Co		601
Naylor & Co		571
Ogden & W		7
Page, N. & Co	50	1,903
Plenty, John		2
Froment, F		440
Wells, F., & Co		15
Total	363	13,639
Corres. date, 1888	2,837	8,460
Steel and Iron Rods.	Tons.	Tons.
Abbott & Co., J	30	5,841
American S. Co	120	1,071
Bacon & Co	5	507
Baker, H		3
Belcher, H. W		14
Boker, H		35
Bruce & Cook		20
Carey & Moen	35	979
Cooper, H. & Co		58
Crabb & Co., W		17
Dana & Co		2,203
Downing & Co	14	805
Durbrow, Walter		829
Eckstein, G. C		298
Fuller, D. & T		15
Galpin, S. H		1,447
Greeley & Co		8
Hazard Mfg. Co		20
Heyn, A		2,124
Hugill, Chas		27
Jansen, J. A		150
Lee & Co., James		105
Lilienberg, N		56
Lundberg, G	310	1,120
Lundell, C. G		248
Merritt, A		3
Milne & Co		2,222
Montgomery & Co		120
Muller, Schall & C	50	503
Naylor & Co		11,186
Nichols, B. J		10
Oelrichs & Co		103
Page, N. & Co	77	701
Pilditch, F. S		15
Plenty, J		1
Pratt Mfg. Co		30
Roebling's Son		2,485
Wagner, W. F		8
Wetherall Bros		2
Wheeler & Co., E. S		120
Whitney & Co		895
Williams & W		5
Wolf & Co	55	4,529
Wright P. & Co		3
Total	696	42,058
Corres. date, 1888	4,440	56,452
Old Rails.	Tons.	Tons.
Baldwin Bros. & Co		240
Bowring & A		57
Crossman & Bro		2,162
Frankfort, M	360	720
Henderson Bros		150
Neumark & Gross		6,115
Perkins, C. L	102	535
Perry & Ryer		177
Sheldon & Co		203
Ward & Co., J. E		21
Wolff, H		239
Total	462	10,191
Corres. date, 1888		10,097
Scrap Iron.	Tons.	Tons.
Bowring, A		25
Burgass & Co		162
Crossman, W. H. & Bro		500
Downing & Co		321
Funch, E. & Co		397
Henry, A. F		100
Neumark & Gross		500
Ruger, Theo		445
Spaulding & Co		172
Ward & Co., J. E		559
Watjen, T. & Co		152
Total		3,833
Corres. date, 1888	328	3,293
Charcoal Iron.	Tons.	Tons
Bacon & Co		97
Downing & Co		671
Lilienberg N		6
Milne & Co		94
Muller, S. & Co		135
Naylor & Co		45
Page, N. & Co		754
Total		1,802
Corres. date, 1888		404
Sheet Zinc.	Lbs.	Lbs.
Crooks & Co		441,814
Lemarch's S's, H		1,554
Total		443,368
Corres. date, 1888		375
Spiegeleisen.	Tons.	Tons
Abbott & Co		3,234
Blakely & McLellan	620	5,207
Crocker Bros	183	17,999
Dana & Co		14,269
Farris & Co		325
Geisenheimer & Co	100	310
Hernsheim, L	600	2,418
Jansen, J. A		10,466
Naylor & Co	50	14,320
Perkins, C. L		4,860
Pierson, C. L	30	45
Walbaum Bros		675
Total	1,583	62,400
Corres. date, 1888	5,792	41,990
Sheet Iron.	Tons.	Tons.
Coddington & Co		456
Downing & Co		16
Kelly, Hugh		5
Total		477
Corres. date, 1888	25	1,230
Iron Ore.	Tons.	Tons.
Bergen Pt. Chem. Co		9,951
Bowring, A		1,300
DeFlores, R		200
Earnshaw, A		5,196
Lawrence, Johnson & Co		489
Sheldon & Co., G. W		25
Total		10,201
Corres. date, 1888		26,394

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co	93,853	748,571
Amer. Metal Co	44,198	4,101,538
Am. & Patterson		2,897,706
Ansonia B. & C. Co	1,250	1,250
Barber & Co		100,000
Belmont & Co		987,500
Friedenstein, Jas		2,258
Fyfe, Robert		100,000
Hurst, F. W. J		113,000
Lewisohn Bros	56,250	1,212,137
Naylor & Co		1,570,500
Orford, C. & S Co		112,013
Piper, D. & Co		3,296
Raftery, T. E		362,000
Seaman, Sam'l H		234,615
Ward & Co., J. E		11,250
Wil'ms & Thune	131,490	131,490
Total	327,041	12,690,026
Corres. date, 1888	243,633	23, 24,337
Copper Matte.		
Abbott & Co		427,613
Amer. Metal Co		4,517,187
Am. & Patterson		1,670,979
Clark, W. A		879,619
Cortis, R. J		240,600
Henriott, F		5,293,560
Lewisohn Bros	314,163	719,184
Nichols & Co., G. H		224,879
Oelrichs & Co		265,800
Seaman, Sam'l H		19,400
Wil'ms, Thune	453,217	16,638,895
Total	767,380	31,976,716
Corres. date, 1888		37,101,505
Copper Ore.		
Burgass & Co		32,460
R. J. Cortis		34,000
Lewisohn Bros	260,000	260,000
Total	260,000	326,460
Corres. date, 1888		181,369

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 and amount of last		
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*				$555,000	Jan.	1887	.15
2	Alice, S. C.	Mont	10,000,000	400,000	25	*				800,000	Dec.	1888	.06¼
3	Alma Cons., G.	Idah.	300,000	30,000	10	*				45,000	Dec.	1888	.50
4	Alturas, G.	Idah.	1,500,000	300,000	5					262,500	Jan.	1888	.37½
5	Amy & Silversmith, S.	Mon.		341,419						247,530	Aug.	1887	.12½
6	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	520,000	Feb.	1889	2.00
7	Argenta, S.	Nev..	10,000,000	100,000	100	335,000	July	1889	.10	40,000	Feb.	1880	.20
8	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10	*				380,000	July	1889	.20
9	Aurora, I.	Mich	2,000,000	100,000	20					155,000	Oct.	1887	1.87½
10	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
11	Belle Isle, S.	Nev..	10,000,000	100,000	100	155,000	Apl.	1889	.10	300,00	Dec.	[illegible]	.25
12	Belcher, G. S.	Nev..	10,400,000	104,000	100	2,822,000	Feb.	1889	.50	15,397,200	Apl	1876	1.00
13	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	88,750	May	1889	.10	187,500	Jan	1887	10
14	Bodie Con., G. S.	Cal.	10,000,000	100,000	100	575,000	Nov	1889	2	1,295,000	Apl.	1885	50
15	Boston & Mont., G.	Mon.	2,500,000	250,000	10	*				520,000	Jun	1886	.15
16	Boston & Mont., C.S.	Mon	2,500,000	100,000	25	*				1,300,000	Nov	1889	1.00
17	Breece, S.	Colo	,000,000	200,000	25	*				2,000	Feb.	1880	.01
18	Brooklyn Lead, L. S.	Utah	500,000	50,000	10					127,000	July	1887	.05
19	Bulwer, G.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	175,000	Jan.	1884	.10
20	Bunker Hill & Sull.	Idah.	3,000,000	300,000	10	*				150,000	Oct.	1882	.06¼
21	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	136,000	Oct	1889	.08
22	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000				2,350,000	Oct.	1889	5.00
23	Carbonate Hill, S. L.	Colo.	1,500,000	200,000	10	*				80,000	Apl.	1884	.05
24	Carlisle, G.	N. M.	1,000,000	200,000	5					175,000	Dec.	1888	.12½
25	Castle Creek, G.	Idah.	100,000	100,000	1					51,000	Oct.	1882	.03
26	Catalpa, S. L.	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
27	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,930,000	Feb.	1889	2.00
28	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
29	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*				406,000	July	1889	.05
30	Confidence, S. L.	Nev..		24,960		287,440	Apl.	1887	.50	199,680	Apl.	1889	1.00
31	Cons. Cal. & Va., G. S.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,196,800	Sept	1889	.50
32	Contention, S.	Ariz.	12,500,000	250,000	50					‡2,587,000	Dec.	1884	.25
33	**Cop. Queen Cons, C.	Ariz.	1,400,000	140,000	10					140,000	Oct	1888	.50
34	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*				228,000	Oct.	1888	.03
35	Crown Point, G. S.	Nev..	10,000,000	100,000	100	2,850,000	Sept	1880	.50	11,588,000	Jan.	187	2.00
36	Daly, S. L.	Utah	3,000,000	150,000	20					1,275,500	Nov	1889	.25
37	Deer Creek, S. G.	Idah.	1,000,000	200,000	5	*				20,000	Jun.	1889	.05
38	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*				1,000,000	Nov.	1887	.10
39	Derbec B. Grav., G. S.	Cal..	10,000,000	100,000	100	90,000	Dec.	1881	.10	180,000	May	1887	.10
40	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*				390,000	Sept	1889	.05
41	Dunstone, G. S. L.	Mont	1,000,000	200,000	5	*				6,000	Nov	1888	.03
42	Eclipse	Colo.	100,000	100,000	1					20,000	Nov.	1887	.10
43	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1883	.50	170,000	July	1887	.05
44	Empire Lt., G.	Mont	500,000	100,000	5					70,500	Oct.	1887	.37½
45	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	550,000	Jun.	1889	.50	4,955,000	July	1888	.25
46	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,425,000	Apl.	1889	.25
47	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1880	.25
48	Father de Smet, G.	Dak..	10,000,000	100,000	100	200,000	Nov	1878	1.00	1,125,000	Dec	1885	.20
49	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871		800,000	Dec.	1888	2.00
50	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*				190,000	July	1886	.10
51	Fresno Enterprise, G	Cal..	5,000,000	100,000	50		Mch	1883	.10	110,000	July	1882	.10
52	Garfield Lt., G. S.	Nev.	500,000	100,000	5					85,000	Apl.	1888	.12½
53	Golconda, G. S.	Idah.	1,000,000	100,000	10					120,000	May	1888	.60
54	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	4,434,600	Oct.	1889	.30	3,826,800	Oct	1870	10.00
55	Grand Central, S.	Ariz.	1,000,000	100,000	10					625,000	Dec	1882	.25
56	Grand Prize, S.	Nev.	10,000,000	100,000	100	685,000	Oct.	1889	.30	49[illegible]	Mar	1884	.25
57	Granite, S. L.	Idah.	500,000	500,000	1	*				10,000	Jan	1888	.02
58	Granite Mountain, S.	Mont	10,000,000	400,000	25					7,600,000	Nov	1889	.50
59	Green Mountain, G.	Cal..	1,250,000	125,000	10	*				212,000	Nov.	188.	.07½
60	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	5,086,000	July	1887	.50	1,162,000	July	1888	.50
61	Hecla Con., S. G. L. C.	Mont	1,500,000	30,000	50					1,332,500	May	1889	.50
62	Hel'a Mg & Red, G.S.L	Mont	3,315,000	663,000	5	*				197,97	July	1880	.06
63	Holmes, S.	Nev.	10,000,000	100,000	100	300,000	Sept	1885	.10	75,000	Apl	1886	.25
64	Holyoke, G.	Idah.	200,000	200,000	1					27,000	Feb.	188.	.10
65	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,468,750	Nov.	1889	.10
66	Honorine, S. L.	Utah	500,000	250,000	2	37,500	Apl.	1889	.05	125,000	Sept	1887	.05
67	Hope, S.	Mont	1,000,000	100,000	10	*				233,252	Apl.	1888	.25
68	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*				4,000,000	Nov.	1884	.50
69	Hubert, G.	Colo.	500,000	50,000	10	*				239,500	Oct.	1888	.11
70	Idaho, G.	Cal..	310,000	3,100	100					5,235,400	Nov.	1889	5.00
71	Ideal, S. L.	Colo.	1,500,000	50,000	10					15,000	Oct.	1886	.05
72	Illinois, S.	N. M.	100,000	100,000	1	*				45,000	Apl	1889	.20
73	Independence, S.	Nev..	10,000,000	100,000	100	340,000	Oct	1886	.20	225,000	Sept	1878	.25
74	Iron Hill, S.	Dak.	2,500,000	250,000	10	134,000	July	1889	.03	156,250	Nov	1887	.07½
75	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*				2,500,000	Apl.	1889	.20
76	Jackson, G. S.	Nev	5,000,000	50,000	100	237,500	Nov	1880	.20	55,000	Jun	1889	.10
77	Jay Gould	Mont	2,000,000	40,000	5	*				365,000	Apl	1889	.04
78	Jocuistita, S.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1886	.50
79	Jumbo, G.	Colo.	2,000,000	200,000	10					35,000	Oct.	1887	.02½
80	Kentuck	Nev..	3,000,000	30,000	100	360,000	July	1889	.30	1,350,000	Dec.	1886	.10
81	La Plata, S. L.	Colo	2,000,000	200,000	10	*				610,000	Sept	1882	.30
82	Leadville Cons., S.L.L.	Colo.	4,000,000	400,000	10	*				423,000	Apl.	1887	.05
83	Lexington, G. S.	Mont	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
84	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*				800,000	July	1888	.10
85	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	50
86	Marion Bullion, G.	N.C.	500,000							15,000	Jan.	1886	
87	Martin White, S.	Nev..	10,000,000	100,000	100	1,175,000	Jan.	1889	25	140,000	Dec.	1886	.25
88	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*				175,000	May	1888	5.00
89	Minnesota, C.	Mich	1,000,000	40,000	25	420,000	Apl	1886	1.00	1,820,000	Mar.	1876	
90	Mono, G.	Cal.	5,000,000	50,000	100	90,350	July	1889	.25	12,500	Mar	1886	.25
91	Montana, Lt., G. S.	Mont	3,300,000	660,000	5	*				2,355,285	Oct.	1889	.12½
92	Morning Star, S. L.	Colo.	1,000,000	100,000	10					775,000	Mar.	1888	.25
93	Moulton, S. G.	Mont	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
94	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb	1887	.30
95	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	150,000	Oct.	1889	.20
96	Napa, Q.	Cal..	700,000	100,000	7					310,000	July	1889	.10
97	Navajo, G. S.	Nev..	10,000,000	100,000	100	485,000	Apl.	1888	.30	365,000	Apl.	1889	.10
98	New Guston, S.	Colo.	500,000	100,000	5					200,000	Oct	1889	.50
99	N. Hoover Hill, G. S.	N. C	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
100	Northern Belle, S.	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl	1883	50
101	North Belle Isle, S.	Nev.	10,000,000	100,000	100	400,000	Sept	1889	.20	230,000	May	1888	.50
102	North Star, G.	Cal..	1,000,000	100,000	10					00,000	Sept	1889	.50
103	Ontario, S. L.	Utah	15,000,000	150,000	100					10,550,000	Nov.	1889	.50
104	Ophir, G. S.	Nev..	10,000,000	100,000	100	4,159,440	May	1889	.50	1,595,800	July	1882	1.00
105	Original, S. C.	Mon.	1,500,000	60,000	25	*				123,000	July	1888	.05
106	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,222,500	Mar.	1889	1.00
107	Oxford, G.	N. S.	125,000	125,000	1	*				78,500	Sept	1888	.02
108	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	57,000	Apl.	1888	.15	150,000	Apl.	1887	.10
109	Parrot, C.	Mont	1,800,000	180,000	10					440,000	Oct.	1889	.05
110	Peacock, S. G. C.	N.M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
111	Plumas Eureka, G.	Cal..	1,406,250	140,625	10					2,548,046	Oct.	1889	.37½
112	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
113	Plymouth Con., G.	Cal..	5,000,000	100,030	50	*				2,280,000	Feb.	1888	40
114	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100					1,728,462	Oct	1889	1.50
115	" com., Q.	Cal..	5,700,000	57,000	100					643,867	July	1882	.40
116	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1862		5,250,000	Aug	1889	2.00
117	Richmond, S. L.	Nev..	1,350,000	54,000	25	*				4,312,587	Jun	1887	1.25
118	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	99,785	Feb.	1880	.50
119	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar	1886	.05
120	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20					100,000	Dec	1882	.50
121	Savage, S.	Nev..	11,200,000	112,000	100	6,542,000	July	1889	50	4,460,000	July	1869	3.00
122	Shoshone, G.	Idah.	150,000	150,000	1					7,500	Apl.	1888	.01
123	Sierra Buttes, G.	Cal..	2,225,000	122,500	10					1,568,145	Apl.	1888	.12½
124	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,250,000	Oct.	1889	.50	102,000	Jan.	1871	1.00
125	Sierra Nevada, S. L.	Idaho	1,000,000	¶	1	*				40,000	May	1889	.02
126	Silver Cord, G. S. L.	Colo.	4,500,000	450,000	10					270,000	Apl.	1889	.10
127	Silver King, S.	Ariz.	10,000,000	100,000	100	50,000	Jun.	1888	.50	1,950,000	July	1887	.25
128	Silver Mg. of L. V.	N. M.	500,000	500,000	1					50,000	June	1889	.05
129	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*				50,000	Nov.	1886	.02
130	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*				3,137,500	Jun	1889	.10
131	Smuggler, S. L.	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25
132	Spring Valley, G.	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan	1881	25
133	Standard, G. S.	Cal..	10,000,000	100,000	100	25,000	Oct.	1884	.25	3,595,000	Jun.	1888	.05
134	Stormont, S.	Utah	500,000	500,000	1	*				155,000	Nov.	1881	.05
135	St. Joseph, L.	Mo..	1,500,000	150,000	10	*				844,000	Dec.	1887	.20
136	Surinam, G.	D. G.	3,000,000	600,000	5					105,000	Nov	1887	.05
137	Swansea, G.	Colo.	600,000	60,000	10	*				9,000	Apl.	1888	.02½
138	Syndicate, G.	Cal..	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
139	Tamarack, C.	Mich.	1,000,000	40,000	25	520,000	Apl.	1885	3.00	1,080,000	Oct	1889	3.00
140	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov	1881	.20
141	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
142	United Verde, C.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
143	Valencia, M.	N. H.	150,000	1,500	100*					37,500	Apl	1886	2.50½
144	Viola Lt., S. L.	Idah.	750,000	150,000	5	*				272,500	Oct.	1888	.37½
145	Ward Cons., S. L.	Colo.	2,000,000	200,000	10					10,000	Apl.	1889	.05
146	Yankee Girl	Colo.	2,500,000	250,000	10					1,275,000	July	1887	.10
147	Yellow Jacket, G. S.	Nev..	12,000,000	120,000	100	5,508,000	Mar	1889	.50	2,184,000	Aug	1871	1.50
148	Webb City, L. Z.	Mo..	55,000	11,000	5					3,300	Jun.	1889	.10

NON-DIVIDEND PAYING MINES

	Name and Location of Company.		Capital Stock.	Shares. No.	Par Value	Assessments. Total levied	Date & am't of last.		
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*			
2	Allouez, C.	Mich	2,000,000	80,000	25	$697,000	Mar	1889	.50
3	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	588,750	July	1889	.87½
4	Alta, S.	Nev	10,080,000	100,800	100	2,248,800	Sept	1888	.50
5	Amador, G.	Cal..	400,000	200,000	2	*			
6	American Flag, S.	Colo	1,250,000	125,000	10	300,000	Jun	1877	.5
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5				
8	Appalachian, Lt., G.	N. C	1,500,000	300,000	5				
9	Astoria, G.	Cal..	200,000	100,000	2				
10	Barcelona, G.	Nev..	5,000,000	200,000	25	*			
11	Bechtel Con., G.	Cal	10,000,000	100,000	100	173,500	Jan.	1889	.10
12	Belmont, S.	Nev.	5,000,000	50,000	100	735,000	Apl	1886	.10
13	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	2,155,390	Sept	1889	.25
14	Big Pittsburg, S. L.	Colo	20,000,000	200,000	100	*			
15	Bi Metallic, S.	Mon.	5,000,000	200,000	25	*			
16	Black Oak, G.	Cal.	3,000,000	300,000	10	*			
17	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000	Nov	1883	.25
18	Bremen, S.	N. M	5,000,000	500,000	10	*			
19	Brunswick, G.	Cal..	2,000,000	400,000	5	*			
20	Bullion, G. S.	Nev	10,000,000	100,000	100	4,007,000	Aug.	1888	.50
21	Calaveras, G.	Cal..	500,000	500,000	1	*			
22	Carisa, G.	Wy.	500,000	100,000	5	*			
23	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	*			
24	Cashier, G. S.	Colo.	500,000	250,000	2	*			
25	Cen. Contin'l, G.S.L.	C. & A	2,000,000	200,000	10	*			
26	Charles Dickens, G.S.	Idao.	1,250,000	250,000	5	*			
27	Cherokee, G.	Cal..	1,500,000	150,000	10				
28	Chollar, S.	Nev..	11,200,000	112,000	100	1,484,000	July	1889	.50
29	Cleveland, T.	Dak	1,000,000	500,000	2	*			
30	Cochis	N. M.	500,000	50,000	10				
31	Commonwealth, S.	Nev.	10,000,000	100,000	10	170,000	Nov	1888	.50
32	Comstock, G. S.	Nev..	10,000,000	100,000	100	30,000	Mar.	1887	.15
33	Con. Imperial, G. S.	Nev..	5,000,000	50,000	100	800,000	Nov	1888	.05
34	Con. Pacific, G.	Cal.	6,000,000	60,000	100	192,000	Oct.	1889	.10
35	Cons Silver, S.	Mo..	2,500,000	250,000	10				
36	Courtlandt	Colo	500,000	50,000	10				
37	Crescent, S. L.	Colo.	3,000,000	300,000	10	*			
38	Crocker, S.	Ariz.	10,000,000	100,000	100	125,000	Jun.	1889	.10
39	Crowell, G.	N. C	500,000	500,000	1				
40	Dahlonega, G.	Ga..	250,000	250,000	1	*			
41	Dandy, S.	Colo.	5,000,000	500,000	10				
42	Dardanelles, G.	Cal..	1,000,000	100,000	10				
43	Decatur, S.	Colo.	1,500,000	300,000	5	*			
44	Denver City, S. L.	Colo.	5,000,000	500,000	10	*			
45	Denver Gold, G.	Colo.	300,000	60,000	5				
46	Durango, G.	Colo.	500,000	500,000	1	*			
47	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar	1886	1.00
48	El Cristo, G. S.	U.S.C	1,000,000	500,000	2				
49	El Dorado, G.	Cal.	1,000,000	250,000	4	*			
50	El Talento, G.	U.S.C	1,000,000	500,000	2				
51	Empire, S.	Utah	10,000,000	100,000	100				
52	Eureka Tunnel, S. L.	Nev..	10,000,000	100,000	100	*			
53	Exchequer	Nev.	10,000,000	100,000	100	815,000	Apl.	1889	.2
54	Found Treasure, G.S.	Nev..	10,000,000	100,000	100	30,500	Apl	1889	12½
55	Gogebic L. Syn., I.	Wis.	5,000,000	200,000	25				
56	Gold Cup, S.	Colo.	500,000	500,000	1	*			
57	Gold 'n Era, S.	Mon.	2,000,000	200,000	10				
58	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec.	1887	.25
59	Gold Rock, G.	Cal.	1,000,000	500,000	2	*			
60	Goodshaw, G.	Cal..	10,000,000	100,000	100	*			
61	Grand Belt, C.	Tex.	12,000,000	120,000	100				
62	Grand Duke	Colo.	800,000	80,000	10				
63	Great Romance, G.	U.S.C	1,000,000	500,000	2	*			
64	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*			
65	Gregory Con., G.	Mon	3,000,000	300,000	10				
66	Harlem M. & M. Co., G.	Cal..	1,000,000	200,000	5				
67	Head Cent. & Tr. S. G.	Ariz.	10,000,000	100,000	100				
68	Hector, G.	Cal..	1,500,000	300,000	5	45,000	Jan.	1889	.15
69	Highland, C.	Mich	500,000	25,000	20				
70	Hollywood	Cal..	200,000	100,000	2				
71	Hortense, S.	Colo.	2,000,000	200,000	10				
72	Huron, C.	Mich	1,000,000	40,000	25	280,000	May	1887	3.00
73	Iron Gold & Silver, S.	N. M.	2,000,000	200,000	10	*			
74	Ironton, I.	Wis.	1,000,000	40,000	25				
75	Iroquois, C.	Mich	1,250,000	50,000	25				
76	J. D. Reymert	Ariz.	10,000,000	100,000	100	*			
77	Julia Cons., G. S.	Nev..	11,000,000	110,000	100	1,660,000	Jan.	1889	.10
78	Kearsarge, C.	Mich	1,250,000	50,000	25	190,000	Oct.	1887	1.00
79	Lacrosse, G.	Colo.	1,000,000	100,000	10	*			
80	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*			
81	Mammoth Bar., G.	Cal..	10,000,000	100,000	100	50,000	Dec.	1881	
82	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Mar.	1884	.15
83	Mayflower Gravel	Cal..	1,000,000	100,000	10	485,000	Jan	1889	.50
84	Medora, G.	Dak	250,000	250,000	1				
85	Mexican, G. S.	Nev	10,000,000	100,000	100	2,775,760	July	1889	.25
86	Middle Bar, G.	Cal.	400,000	200,000	2	*			
87	Mike & Starr, S. L.	Colo	1,000,000	200,000	5	*			
88	Monitor, G.	Colo.	100,000	100,000	1	*			
89	Moose Silver, S.	Colo	3,000,000	300,000	10	*			
90	Mutual Mg. & Sm.	W'sn	100,000	100,000	1	*			
91	Native, C.	Mich	1,000,000	40,000	25				
92	Neath, G.	Colo.	1,000,000	100,000	10				
93	Nevada Queen, S.	Nev	10,000,000	100,000	100	250,000	Oct.	1889	.20
94	New Germany, G.	N. S.	100,000	100,000	1	*			
95	New Pittsburg, S. L.	Colo	2,000,000	200,000	10	*			
96	N. Commonw'h, S.	Nev.	10,000,000	100,000	100	60,000	Apl	1889	.30
97	North Standard, G.	Cal..	10,000,000	100,000	100	20,000	Nov		
98	Noonday	Cal..	600,000	60,000	10	208,000	Dec.	1881	.10
99	Oneida Chief, G.	Cal.	500,000	125,000	150	*			
100	Oriental & Miller, S.	Nev..	10,000,000	400,000	25				
101	Osceola, G.	Nev..	5,000,000	500,000	10	*			
102	Overman, G. S.	Nev.	11,520,000	115,200	100	3,794,600	July	1889	.25
103	Park, S.	Utah	2,000,000	200,000	10				
104	Peer, S.	Ariz.	10,000,000	100,000	100	155,000	Sept	1889	.10
105	Peerless, S.	Ariz.	10,000,000	100,000	100	370,000	Mar.	1889	.25
106	Phœnix	Ariz.	500,000	500,000	1	*			
107	Phœnix, G. S.	Ark.	5,000,000	200,000	250	*			
108	Phœnix Lead, S. L.	Colo.	100,000	100,000	1	*			
109	Pilgrim, G.	Cal..	600,000	300,000	2	*			
110	Potosi, S.	Nev..	11,200,000	112,000	100	1,461,600	Sept	1889	.50
111	Proustite, S.	Idah	250,000	250,000	1	*			
112	Puritan S. G.	Colo.	1,500,000	150,000	10	*			
113	Quincy	Colo.	3,000,000	300,000	10				
114	Rappahannock, G.S.	Va..	250,000	250,000	1	*			
115	Red Elephant, S.	Colo.	500,000	500,000	1	*			
116	Ropes, G. S.	Mich	2,000,000	80,000	25	147,200	July	1887	.50
117	Russell, G.	N. C.	1,500,000	300,000	5				
118	Sampson, G. S. L.	Utah	10,000,000	100,000	100	288,157	July	1888	1.00
119	San Sebastian, G.	San S	1,600,000	320,000	5	*			
120	Santa Fe, C.	N. M.	5,000,000	500,000	10				
121	Santiago, G.	U.S.C	400,000	200,000	2	*			
122	Security, S.	Colo.	10,000,000	1,000,000	10				
123	Sheridan	N. M.	2,000,000	200,000	10				
124	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*			
125	South Bulwer, G.	Cal..	10,000,000	100,000	100	100,000	May	1881	.2
126	South Hite	Cal..	10,000,000	100,000	100	195,000	Jan.	1883	.05
127	South Pacific	Cal..	500,000	100,000	5				
128	Stanislaus, G.	Cal..	2,000,000	200,000	10				
129	State Line, S.	Nev..	250,000	250,000	1				
130	St. Kevin, G. S.	Colo.	100,000	100,000	1	*			
131	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*			
132	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10				
133	St. L. & St. Felipe, G. S.	Mex.	1,500,000	150,000	10				
134	St. L. & Sonora, G.S.	Mex.	1,500,000	150,000	10				
135	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*			
136	Sunday Lake, I.	Mich	1,250,000	50,000	25				
137	Sullivan Cons., G.	Dak.	600,000	200,000	3	*			
138	Sutter Creek, G.	Cal..	500,000	100,000	5				
139	Sutro Tunnel	Nev..	20,000,000	2,000,000	10	*			
140	Sylvanite, S.	Colo.	5,000,000	500,000	10	*			
141	Taylor-Plumas, G.	Cal..	1,000,000	200,000	5	10,000	Feb.	1888	
142	Tioga Cons., G.	Cal..	10,000,000	100,000	10	295,000	May	1888	
143	Tornado Cons., G. S.	Nev..	100,000	100,000	1	*			
144	Tortilita, G. S.	Ariz.	1,000,000	100,000	110	*			
145	Tuscarora, S.	Nev..	10,000,000	500,000	20	160,000	Oct.	1889	.10
146	Union Con., G. S.	Nev..	10,000,000	100,000	100	3,260,000	Oct.	1889	.25
147	Utah, S.	Nev..	10,000,000	100,000	100	170,000	July	1889	.25
148	Washington, C.	Mich	1,000,000	40,000	25				
149	West Granite Mt., S.	Mon.	5,000,000	500,000	10	*			
150	Zelaya, G. S.	C. A.	600,000	300,000	2	*			

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 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 Aug., 1881, the California had paid $31,320,000 in dividends, and the Con. Virginia, $240 60,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ 1,000,000

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Nov. 23. H.	Nov. 23. L.	Nov 25. H.	Nov 25. L.	Nov. 26. H.	Nov. 26. L.	Nov. 27 H.	Nov. 27 L.	Nov. 28 § H.	Nov. 28 § L.	Nov. 29. H.	Nov. 29. L.	SALES.
Alice, Mont	1 20	.....	1.20	1.10	1 25	1.20	1.20	1.15	....	....	....	..	2,800
Argenta, Nev	....	.....	...	....	....	....	....	....	....	....	....	....	.....
Atlantic, Mich	....	..	....	....	....	....	....	....	....	....	....	....	.....
Bassick, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Belcher	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Belle Isle, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Bodie Cons. Cal	.70	.....	....	....	....	....	....	....	....	....	....	....	100
Bes. & Mont., Mont	....	....	....	....	....	....	....	....	....	....	....	....	.....
Breece, Colo	30	....	....	....	....	.30	....	....	....	....	....	....	600
Bulwer, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Caledonia, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Calumet & Hecla	....	....	....	....	230¾	....	....	....	....	....	....	....	8
Chrysolite	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Con. Cal. & Va., Nev.	6 50	....	6.38	5.88	6.38	....	6.33	6.25	....	....	6 1*	....	1,150
Crown Point, Nev	...	..	2.60	....	....	....	....	....	....	....	....	....	1 0
Deadwood, Dak	...	.....	....	....	1.55	...	....	....	....	....	....	....	2
Eureka Con., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Father de Smet, Dak	.51	50	....	....	.65	.6	.....	.. ..	....	....	.60	.. ..	600
Frank In, Mich	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Freelan, Co O	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Gould & Curry, Nev	....	.....	....	....	....	....	1.75	....	....	....	....	....	100
Hale & Norcross, Nev	3.10	.. .	3 15	....	3.15	....	....	....	....	....	3.10	....	430
Holyoke, Id	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Homestake, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Horn-Silver, Ut	2.35	2.3	2 30	2 35	2.30	2 25	2.45	....	....	....	2.35	2 2	2,020
Iron Hill, Dak	...	....	....	....	....	....	....	....	....	....	....	....	.....
Iron Silver, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Leadville C., Colo	.12	.. .	.11	....	12	....	....	....	....	....	....	....	1,500
Little Chief, Colo	34	....	.34	.....	.34	.33	.34	....	....	....	.34	....	2,500
Little Pittsburg, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Moulton, Mont	....	.. ..	.30	....	....	....	....	....	....	....	....	....	100
Mount Diablo, Nev	..	.....	....	....	....	....	....	....	....	....	....	....	.....
Navajo, Nev	.37	.....	.38	....	....	....	....	....	....	....	....	....	900
Nevada Belle Isle, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
North Star, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Ontario, Ut	35 75	....	....	....	....	....	....	....	....	....	....	....	12
Opair, Nev	..	.. .	4.20	....	....	....	4.15	....	....	....	....	....	200
Osceola, Mich	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Plutus, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Plymouth, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Quicksilver, Com	....	.....	....	....	....	....	5.63	....	....	....	....	....	.....
Quincy, Mich	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Robinson Cons. Colo	.37	.36	....	....	....	....	....	....	....	....	....	....	300
Savage, Nev	....	.....	2.60	....	1.55	....	....	....	....	....	....	....	100
Sierra Nevada, Nev	....	.....	....	....	....	....	2.75	....	....	....	....	....	100
Silver Cord	....	.....	....	....	.70	.65	....	....	....	....	....	....	600
Silver King	30	....	.25	.20	....	....	....	....	....	....	....	....	1,000
Silver Mg of L V	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Standard	....	.....	....	....	....	....	....	....	....	....	.60	....	200
Stormont, Utah	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Tamarack, Mich	....	.....	....	....	136⅜	....	....	....	....	....	....	....	10
Ward Con	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Yellow Jacket	....	.....	2.85	....	2.80	....	2.75	....	....	....	....	....	3[illegible]

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Nov. 23. H.	Nov. 23. L.	Nov. 25. H.	Nov. 25. L.	Nov 26. H.	Nov 26. L.	Nov 27. H.	Nov 27. L.	Nov 28 § H.	Nov 28 § L.	Nov. 29. H.	Nov. 29. L.	SALES
Alpha	....	.. .	....	....	....	....	....	....	....	....	....	....	.....
Alta, Nev	....	.. .	2.20	....	2.10	....	2.10	....	....	....	....	....	.....
Andes, Nev	1.10	....	....	.....	....	....	....	....	....	....	....	....	300
Amador, Cal	....	....	....	....	....	....	....	....	....	....	....	....	100
American Flag, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Astoria, Cal	.35	.33	.36	.28	.27	.25	.24	.13	....	....	.14	.10	13,900
Barcelona, Nev	....	...	40	....	....	....	.40	....	....	....	....	....	700
Best & Belcher, Nev	3.25	....	3.25	....	3 30	....	....	....	....	....	3.20	....	4 0
Brunswick, Cal	....	.....	....	....	....	....	.02	....	....	....	....	....	1 0 0
Buffalo Iron Min'g	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Bullion, Nev	.80	....	....	....	....	....	.85	....	....	....	....	....	500
Cashier, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Castle Creek, Id	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Caollar, Nev	....	....	1.65	....	....	....	....	....	....	....	....	....	.....
Commonw'th, Nev	....	....	3 00	....	....	....	....	....	....	....	....	....	200
Comstock T., Nev	.21	....	.23	.21	.22	....	.22	.23	....	....	.23	....	100
Con. Imperial, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	7,300
Con. Pacific, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo	....	.. ..	....	....	....	....	....	....	....	....	....	....	.....
Eastern Oregon	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Eleventh Rep of Col	1.25	....	1.25	....	1.15	1 10	1.10	....	....	....	1.15	1.10	1,200
Excelsior, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Exchequer Nev	.15	....	....	....	....	....	.80	....	....	....	....	....	500
Hector, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Julia, Nev	.40	....	....	....	....	....	.40	....	....	....	....	....	700
Kingston & Pemb'ke	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kossuth, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lacrosse, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Lee Basin, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Mexican, Nev	3.50	....	3 35	....	....	....	3.35	....	....	....	....	....	380
Middle Bar, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Monitor, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Mutual Sun & M Co	1.60	....	1 70	....	1.70	....	1.65	....	....	....	1.65	....	1,400
Nevada Queen, Nev	....	....	.85	....	....	....	.80	....	....	....	....	....	200
N. Com'nw'th, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Occidental, Nev	1 25	....	1.20	....	1.10	....	1.15	....	....	....	....	....	1,100
Oriental & Mil, Nev	.06	....	....	....	.06	....	.06	....	....	....	.06	....	4,700
Overman, Nev	1.15	....	1.15	.. .	....	....	1.20	....	....	....	1.10	....	1,000
Patenia of Ariz	....	....	.51	....	....	....	....	....	....	....	....	....	100
Potosi, Nev	....	....	1.85	....	1.80	....	....	....	....	....	1.85	....	350
Rappahannock, Va	.06	....	.06	.05	.05	....	.05	....	....	....	.05	....	6,000
S. Sebastian, San S	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Scorpion, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Shoshone Idaho	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Silver Hill, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Stanislaus, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Sutro Tunnel, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
" Trust Cert.	....	.....	.56	....	....	....	....	....	....	....	....	....	.....
Sutter Creek, Cal	.53	.52	53	....	.54	.53	.54	....	....	....	.54	....	1,000
Union Cons., Nev	....	....	....	....	....	....	....	....	....	....	....	....	3,.00
United Copper	1.20	....	1 15	....	....	....	1.10	....	....	....	....	....	.....
Utah, Nev	....	....	1 0	....	.95	....	1.00	....	....	....	.95	....	1,000

*Ex. dividend. †Dealt in at the New York Stock Ex. Unlisted securities ‡Assessment unpaid. Dividend shares sold, 15,750. Non-dividend shares sold, 49,030. Total, New York, 64,780.
§ Thanksgiving

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Nov. 22.		Nov. 23.		Nov. 25.		Nov. 26		Nov. 27.		Nov. 28 *		SALES.
Atlantic, Mich	12 63	12.50	12 88	12 75	12.75	....	13 25	12.75	13.5	....	.....	.....	1,285
Bodie, Cal	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Bonanza Developm't	....	.....	....	....	....	....	....	....	70	....	.....	.....	100
Bost. & Mont., Mont	44 50	44.00	44.50	44.25	44.50	44.00	45.50	44 00	46.25	45.50	.. ..	....	4,323
Breece, Colo	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Calumet & Hecla, Mich	238	235½	237	235½	....	....	240	236½	....	....	.....	.....	178
Catalpa, Colo	....	.....	....	....	....	....	....	....	.11	....	.....	.....	5.0
Central, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Chrysolite, Colo	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Con. Cal & Va., Nev	....	....	....	....	....	....	....	....	....	....	.....	.....	.....
Dunkin, Colo	.75	.....	..	....	....	....	.75	.....	.. ..	....	.....	.....	500
Enterprise	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Franklin, Mich	15.00	.....	15 25	....	16.0	15 25	15.75	15 2	16 38	16 00	.....	.....	2,132
Hale & Norcross, Nev	....	.....	....	....	....	....	....	....	.18	....	.....	.....	200
Honorine, Utah	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Little Chief, Colo	....	.. ..	....	....	....	....	....	....	....	....	.....	.....	.....
Little Pittsburg, Colo	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Martin White, Nev	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Mount'n	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Napa, Cal	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Ontario, Utah	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Osceola, Mich	15.50	15 00	15.50	15.0	16 25	16.00	17 25	16 25	19 00	17.75	....	....	1,935
Pewabic, Mich	.. ..	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Quincy, Mich	65 0	64.00	....	....	....	....	70.00	67.00	68.00	....	.....	.....	75
Ridge, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Sierra Nev., Nev	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Silver King, Ariz	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Standard, Cal	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Tamarack, Mich	138	.....	...	....	136	...	140	138	145	140	.....	.....	185

NAME OF COMPANY.	Nov. 22.		Nov. 23.		Nov. 25.		Nov. 26.		Nov. 27.		Nov. 28.*		SALES.
Alloues, Mich	..	.....	.70	....	.90	.88	.....	.....	.95	....	....	.....	1,150
Arnold, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Aztec, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Bowman	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Butte & Bost., Mont	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Canada	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Cashier, Colo	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Crescent, Colo	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Denver City, Colo	....	.....	....	....	....	....	....	....	09	....	.....	.....	300
Don Enrique, N M	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Everett, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Hanover, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Humboldt, Mich	....	.....	....	....	....	....	....	....	.15	....	.....	.....	150
Hungarian	....	.....	....	....	....	....	....	....	.20	....	.....	.....	200
Huron, Mich	....	.....	....	....	....	....	2.36	....	....	....	.....	.....	100
Kearsarge, Mich	....	.....	8.13	....	8.0	7.75	8.00	7.88	8.50	8.25	.....	.....	1,744
Mesnard, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
National, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Oriental & M., Nev	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Phœnix, Ariz	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Pontiac, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Rappahannock, Va	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Rockland	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Santa Fe, N. Mex	.75	.73	....	.....	.75	.73	.73	.73	.70	.75	....	....	3,450
Security, Colo	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Shoshone Idaho	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
South Side, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
St Louis Cop., Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	.....
Washington, Mich	....	.....	....	....	....	....	....	....	....	....	.....	.....	100

* Thanksgiving. Boston: Dividend shares sold, 11,4 3. Non-dividend shares sold, 7,194. Total Boston, 17,407.

COAL STOCKS.

NAME OF COMPANY.	Par v l. of sh'rs.	Nov. 23. H.	Nov. 23. L.	Nov. 25. H.	Nov. 25. L.	Nov. 26. H.	Nov. 26. L.	Nov. 27. H.	Nov. 27. L.	Nov. 28* H.	Nov. 28* L.	Nov. 29 H.	Nov. 29 L.	Sales.
American Coal	.....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cambria Iron	.....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cameron Coal & Iron Co	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Ches. & O. RR	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Chic. & Ind. Coal RR	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Col. & Hocking Coal	100	....	....	18	....	....	....	....	....	....	....	....	....	200
Col., C. & I	100	35	34¾	35	34	35	34	35	33¾	....	....	34¼	33⅝	4,580
Consol. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Del. & H. C	100	....	....	148¾	148	148⅛	....	149	147½	....	....	146⅜	146	1,095
D., L. & W RR	50	142¼	141¾	142	141⅜	148⅝	148¾	141⅞	141	....	....	141	139¾	36,506
Hocking Valley	100	22	21⅛	21½	21¼	22⅝	21½	21⅝	21	....	....	21½	....	1,418
Hunt. & Broad Top	....	18¼	....	....	....	18	....	....	....	....	....	....	....	300
Do. pref	....	45	....	....	....	....	....	....	....	....	....	....	....	100
Lehigh C. & N	50	5 ⅞	53⅜	....	....	53½	....	54¼	53⅜	....	....	....	....	799
Lehigh & W. B. Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lehigh Valley RR	50	54¼	....	53⅛	....	53¼	53½	53⅛	53	....	....	....	....	757
Marshall Con. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mahoning Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Maryland Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Morris & Essex	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
New Central Coal	50	8	....	....	....	....	....	8	....	....	....	....	....	220
N. J. C. RR	100	120¼	120⅛	121½	121¼	120¾	....	120	....	....	....	120	118½	2,420
N. Y. & S. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. Y., Susq. & Western	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	100	....	....	23½	....	33⅝	33½	....	....	....	....	33	32½	1,050
N. Y. & Perry C. & I	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Norfolk & Western R.R.	50	....	....	....	....	....	....	....	....	....	....	19⅞	....	100
Do. pref	50	60	....	60⅞	60¼	61⅛	60⅞	61	60¾	....	....	59⅝	59¼	1,727
Penn. Coal	50	....	....	....	....	....	....	....	....	....	....	....	....	.....
Penn. RR	50	52⅜	52⅛	52⅛	52⅜	52⅜	52¼	52¼	52⅛	....	....	....	....	2,422
Ph. & R. RR.**	.....	41⅜	40⅜	41¾	40¾	41⅜	41¼	41¼	40⅞	.....	.....	41	40¼	89,975
Sunday Creek Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tennessee C. & I. Co	.....	75¼	75⅜	78¼	76	81⅛	78⅛	85¼	80	.....	.....	80½	76	16,031
Do. pref	100	....	....	100½	....	....	....	101¼	101	....	....	....	....	500
Westmoreland Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	.....

*Thanksgiving.
**Of the sales of this stock, 26,525 were in Philadelphia, and 63,450 in New York. Total sales, 160,180.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS. Nov. 22.	Nov. 23.	Nov. 25.	Nov. 26.	Nov. 27.	Nov. 28.*
Alpha	....	....	....	....	....	....
Alta	....	3 10	2.05	2.00	2.00	....
Belcher	....	....	....	....	....	....
Belle Isle	....	....	....	.25	....	....
Best & Bel.	3.25	3.15	3.10	3.20	3.15	.....
Bodie	.60	.65	.60	.60	.60	.....
Bulwer	....	....	....	.25	....	....
Challar	1.70	1.5.	1.65	1.55	1 60	.....
C'm'weal'h	....	2 90	....	3.00	3. 0	.....
Con. C. & V	6.25	6.25	6.25	6.00	6.13	.....
Con. Pac.	....	....	....	....	....	.....
Crown Pt.	2.65	2.55	....	....	2.50	.....
Eureka C.	....	....	....	....	....	.....
Gould & C.	.....	1.88	1.65	1.65	1.75	.....
Grd. Prize.	....	....	....	....	....	.....
Hale & N.	3.05	2.95	2.90	....	2.95	.....
M. White	....	....	....	....	....	.....
Mexican	3.55	3.30	3.10	3.20	3.15	.....
Mono	....	....	....	....	....	.....
Mt. Diablo	....	....	....	....	....	.....
Navajo	.30	.30	.25	....	.30	.....
Nev. Queen	....	....	....	.75	....	.....
N. Belle I	....	....	....	....	....	.....
Occidental	....	....	....	....	....	.....
Ophir	4.65	4.55	4.00	4.05	4.20	.....
Potosi	1.85	1.75	1.70	....	1.80	.....
Savage	....	1.45	....	....	1.50	.....
Sierra Nev	2.70	2.55	2.50	2.65	2.55	.....
Union Con.	3 35	3.25	2.90	3.15	3.15	.....
Utah	.90	90	.85	.90	.90	.....
Yellow Jkt.	2.90	2 75	2.65	2 65	2.65	.....

* Thanksgiving.

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid.	Asked.
Atlantic Coal	....	....
Balt. & N. C	.06@.08	.12
Big Vein Coal	....	1.50
Conrad Hill	....	....
Cons. Coal	.23@.23½	.27
Diamond Tunnel	.30@ 35 .45@.50	
George's Crk. C	1.12½@1.15	....
Lake Chrome	....	....
North State (Balt.)	....	.22
Silver Valley	....	....

Prices bid and asked during the week ending Nov. 27th, 1889.

Birmingham, Ala.

COMPANY.	Bid.	Asked.
Ala. Con. C. & C. Co	....	$20
Ala. R. Mill Co.	....	$60
*Alice Furnace.	$102	....
Anna Howe G. Mg. Co	$¼	$⅜
Bess. Land Co.	$22½@$23¾	$23½@$24
Bir. Mg.& Mg.		$120
Broken Arrow.	....	$3¾
Cahaba Coal Mg Co	....	$77½
Camille Gold Mg. Co	$½	$¾
De Bardeleben C. & I. Co	....	$59
Decat. L. Imp.	$9½@$9¾	$10 7 $11¼
DecaturMin.L.	$15@$19	$21 $23
Enterprise Mtg.	....	$38@$40
*Eureka	$100	....
Florence L. & Mg. Co	17½	....
Hen. S. & M.Co	$45@$45⅝	$62½@$64
Jagger Towley C. & C	$11@$11½	....
Mag-Ellen	$91	....
Mary Lee C. & R. Co	$30	$50
Sheffield C & I. Co	$57@$57½	....
Sloss I. & S.	$53@$53¼	.55
†Sloss I. & S.	....	$95
††Sloss I. & S.	$74	$80
Tuscaloose C. I. & L. Co	$20½	....
Tenn.C. & I. Co.	$76@$76½	$80
" pref.	$100	....
Woodstock I.Co.	$59	$61

Prices bid and asked during week ending Nov. 26th.

* Bonds. † First mortgage. †† Second mortgage.

Denver, Colo.

COMPANY.	H.	L.	Sales.
Allegheny, Colo	.45	.35	38,900
Amity "	.20	.16	124,200
Aspen Mutu'l"	.20	.10	148,800
Big Indian "	.24	.21	43,500
Brownlow "	.50	.40	35,600
Calliope "	.50	.45	3,300
Claudia, J., "	.27	.15	47,400
Clay County "	.55	.10	200
Hard Money "	.10	.05	2,600
Legal Tender "	.09	.07	41,300
Matchless "	1.92½	1.60	26,800
May-Mazeppa"	.55	.34	268,400
Mollie Gibson"	.55	.47½	500
Morning Glim"	.28	.23	93,300
Puzzler "	.19	.15	20,000
Silver Cord "	.82½	.75	200
Whale "	.34	.31	21,100
Total	....	....	915,100

Prices during the week ending Nov. 20, 1889.

Kansas City, Mo.

Nov. 26.

COMPANY.	Par value.	Bid.	Asked.
Ben Harrison	....	$25.00	$35.00
Burch, L. & Z., Mo	1	.20	.30
Hillsboro Gold	....	....	....
Farmers' Coal Co	....	50.00	75.00
Ida Hill, S., N. Mex	100	90.00	100.00
Kan. City M. & M. Co.	....	....	3.00
K. C., Colo.	....	....	1.00
Kentuck, Z., Mo	1	....	.02
La Motte, Mo.	100	98.00	100.00
Maverick, S., Colo.	10	.97	1.00
Minnequa Zinc.	....	.25	.40
Sonora, G. & S., Mex.	10	1.00	1.02
Standard, S. S., Colo.	....	10.00	....
Silver Monument	....	....	3.00
Templar, N. Mex.	1	.09	....
The Sylph	....	....	2.50
Webb City, L. Z., Mo.	5	5.65	....
Wichita, L. Z., Kan	100	....	40.00
Granite	....	....	....

Pittsburg, Pa.

COMPANY.	H.	L.	Closing
Bridgewater Gas Co.	....	....	....
Chartiers Val. Gas	....	....	....
Columbia Oil Co.	$3.00	$2.50	$3.00
Consolidated Gas Co.	38.00	38.00	38.00
Hazlewood Oil Co.	55.00	50.50	55.00
Hidalgo Mg. Co	....	....	....
La Noria Mining	*.63	*.63	*.63
Luster Mg. Co.	*15.00	*14.38	*15 00
Nat. Gas Co. of W. Va	....	....	....
N.Y.& Clev.Gas Coal.	37.00	35.00	35.88
Ohio Valley Gas	....	....	....
Pennsylvania Gas	*14.00	*13.75	*14.00
People's Nat. Gas Co.	....	....	....
People's N. G. & P. Co.	16.00	14.50	15.50
Philadelphia Co.	*30.75	*30 00	*30.38
Pittsburg Gas	64.00	64.00	64.00
Silverton Mining	1.00	1.00	1.00
South Side Gas	24.00	24.00	24.00
Union Gas	60.00	60.00	60.00
W'house A. B. Co.	*114.00	*114.00	*114.00
W'house E. Light.	49.50	48.00	49.00
Wheeling Gas	28.00	27.25	28.00
Yankee Girl Mg.	3.50	3.50	3.50

Sales during the week ending Nov. 21;

* Actual selling price. †Ex-dividend.

La Noria Mg. Co.	400 shares	.63
Luster Mg. Co.	258 shares	$14.38@$15.00
Penn. Gas	15 shares	13.75@ 14.00
Philadelphia Co.	510 shares	30.00@ 30.75
W'house A.B.Co.	3 shares	114.00

St. Louis.

Nov. 26.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo	$ .30	$ .33¾
American & Nettie	3.00	3.22½
Aztec, N. Mex	.16¼	....
Black Oak, Cal	.05½	.06½
Black Spar	....	....
Bremen	....	....
Buckskin	.02½	.03½
Carriboo, Idaho	....	....
Central Silver	.35	.36¼
Cleveland, Colo	.04	.04½
Cleveland, Idaho	.70	.75
Cœur d'Alene	....	....
Dinero	.03	.05
Golden Era, Mont	.01½	.02½
Golden King	.15	.20
Golden West	....	....
Gold Pioneer	....	....
Gold Point	....	....
Gold Run	.01½	.03
Granite Mountain, Mont.	40.00	40.50
Hope	....	....
Ingram	....	....
Iron Clad	.21¼	....
Ivanhoe, Colo	....	.25
I. X. L., Colo	.07½	.08½
Jumbo	.00½	.02
Keystone	.03	.04
La Union	....	.04½
Little Giant	....	....
Major Budd, Mont	.22½	.23¾
Mexican Imp., Mex	.18¾	....
Michael Breen	.75¾	.77½
Montrose Placer	.40	.50
Mountain Key	.60	.72½
Mountain Lion	.11½	.12½
Neath, Colo	.15	....
Old Colony	....	....
Old Jesuit	.02½	.03½
Pat Murphy, Colo	....	.09
Phillips, Colo	.25	.26¼
Pine Grove, Idaho	.02½	.03½
Queen of the West, Idaho	.09	.12½
Raspberry, Mont	.06	.25
Rosalia	....	....
San Francisco, Mont	.06½	.07
San Pedro	....	....
Silver Age, Colo	2.47½	....
Silver Bell	.06	....
Small Hopes, Colo	1.00	1.15
Tourtelotte, Colo	.03½	.04½
West Granite, Mont	.85	.86¼
Wire Patch	.12½	.17½
Yuma, Ariz	.36¼	.38¾

Electric Stocks.

Nov. 29.

The following closing quotations are reported to-day by Tobey & Kirk, New York City:

COMPANY.	Par value.	Market price.
Brush	$ 50	....
" Illuminating	100	$70 @$80
Daft	100	$30 @$40
Consolidated	100	$52½@$57½
Edison	100	$90 @$94
" Illuminating	100	$92 @$95
Julien	100	@ $9
" Traction	100	$3½@ $4½
United States	100	....
" " Illum	100	....
Westinghouse	50	$47 @$49
Thomson-Houston	..	$57 @$59
Thomson-Hous. Welding Co	..	....

Trust Stocks.

Nov. 29.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

American Cotton Oil	$29⅜@$30
Cattle Trust	12 @ 15
Distillers' & Cattle Feeders'	39 @ 40
Linseed Oil	44 @ 45
National Lead	18¾@ 19
Natural Gas	114 @120
Standard Oil	167 @168
Sugar Refineries	66¼@ 66¼

Sales at the New York Stock Exchange week ending Nov. 29:

	Sales.	Price H.	Price L.
American Cotton Oil	47,970	32⅝	29⅛
National Lead	66,490	19⅞	18⅛
Sugar	78,000	71⅛	65¾

Foreign Quotations.

London. Nov. 16.

COMPANY.	Highest.	Lowest
Almada. Mex	1s. 9d.	1s. 3d.
Alturas Gold, Idaho	....	....
Amador, Cal	1⅛s.	⅞s.
Appalachian, N. C	1s 9d.	1s. 3d.
Arizona Copper, Ariz.	....	....
California Gold, Colo.	....	....
Callao Bis, Venz	....	....
Canadian Phos. Canada.	£⅜	£⅛
Carlisle, N. Mex	3s. 3d.	2s. 9d.
Colorado, Colo	2-16s.	1-16s.
Comstock, Utah	....	....
Condova	1s.	6d.
Cons. Esmeralda, Nev.	4s.	3s.
Denver Gold, Colo.	1s. 3d.	9d.
Dickens Custer, Idaho.	3s. 6d.	3s.
East Arevalo, Idaho	2s. 6d.	2s.
Eberhardt, Nev	....	....
El Callao, Venezuela	....	....
Elmore, Idaho	3s. 3d.	2s. 9d.
Empire, Mont	....	⅛s.
Flagstaff, Utah	....	....
Garfield, Nev	3s. 6d.	2s. 6d.
Hambley Freehold N.C.	....	....
Ilex, Cal	....	....
Jay Hawk Mont	4s. 6d.	3s. 6d.
Josephine, Cal	7s.	5s.
Kohinoor, Colo	2s. 3d.	1s. 9d.
La Luz, Mex	2s. 9d.	2s. 3d.
La Trinidad, Mex	3s. 6d.	2s. 6d.
La Valera, Mexico	2⅛s.	1⅞
Mason & Barry, Port	....	....
Montana Lt., Mont	£1 9-16	£1 7-16
New California, Colo	12s.	11s.
New Consolidated	1s.	6d.
New Eberhardt, Nev	1s. 9d.	1s. 3d.
New Emma, S., Utah	3s. 6d.	3s.
New Flagstaff, Utah	1s. 6d.	1s.
Newfoundland, N. F	3s.	2s. 6d.
N. Gold Hill, N. C.	1s. 6d.	1s.
New Hoover Hill, N. C.	....	....
Old Lout, Colo	£⅛	£¼
Palmarejo, Mex	24s.	23s.
Pittsburg Cons., Nev	£⅜	£¼
Quebrada, Venezuela	....	....
Richmond Con., Nev	2s.	1¾
Ruby&Dunderberg, Nev	1s.	6d.
Russell Gold, N. C.	....	....
Sam Christan, N. C.	3s.	2s. 6d.
Sierra Buttes, Cal.	£⅜	£¼
Stanly, N. C	7s. 6d.	6s. 6d.
United Mexican, Mex	7s.	5s.
U. S. Placer, Colo	7s. 6d.	6s. 6d.
Viola Lt., Idaho	2s. 3d.	1s. 9d.

Paris.*

Nov. 14.

Belmez, Spain	550.00	550.00
Boleo, Mex	....	....
Callao, Venez	111 25	111.25
Callao Bis, Venez	12.50	12.50
East Oregon, Ore	18.25	18.25
Forest Hill Divide, Cal.	300.00	300.00
Golden River, Cal	350.00	350.00
" " parts	61.25	65 25
Lexington, Mont	122.50	122.50
" parts	4.50	4.50
Ouray, Colo	23.00	23.00
Rio Tinto, Spain	387.50	387 50
Tharsis, Spain	110.50	110.50

* Francs.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—acetic, ℔ 100 lbs. $2.00
Muriatic, 18°, ℔ 100 lbs 1.00@1.50
Muriatic, 20°, ℔ 100 lbs 1.12½@1.75
Muriatic, 22° ℔ 100 lbs 1.37½@2.00
Nitric, 36°, ℔ 100 lbs 4.00@4.25
Nitric, 42°, ℔ 100 lbs 6.00@6.25
Oxalic, ℔ 100 lbs 9.50@10.50
Sulphuric, 60°, ℔ 100 lbs. 80@1.25
Sulphuric, 66°, ℔ 100 lbs 1.00@1.75

Alkali—
Refined, 48 p. c 1.40@1.50
Refined, 58° 1.35@1.40

Alum—Lump, ℔ lb. 1¾
Ground, ℔ lb. 1⅞@2
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10

Aqua Ammonia—18°, ℔ lb. 4¾
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

Ammonia—Sul., ℔ 100 lbs. 3.05
Carb., per lb. 7½@8½

Arsenic—White, powdered, ℔ lb. 3½@3⅝
Red, ℔ lb 5¾@6¾
White, at Plymouth, ℔ ton £12 2 6d.

Asbestos—Am., p. ton $50@$300
Italian, p. ton, c. i. f. L'pool £18@£60

Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb. 4½@5½c.
Hard Cuban, ℔ ton $28.00
Trinidad, refined, ℔ ton $30.00

Barytes—Sulph., Am. prime white 17@20
Sulph., foreign, floated, p. ton 19½@21.50
Sulph., off color, p. 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

Bleach—Over 35 p.c., ℔ lb. 1.75@1.85

Borax—Refined, ℔ lb. 9½@9⅝
Concentrated 7¾@8¾
Refined at Liverpool, ℔ ton £29

Brimstone—*See Sulphur.*

Bromine—℔ lb. 37@38

Chalk—℔ ton 1.75
Precipitated, ℔ lb. 4¾@5

China Clay—English, ℔ ton 13.50@18.00
Southern, ℔ ton 13.50

Chrome Yellow—℔ lb. 10@25

Cobalt—Oxide, ℔ lb. 2.60@2.90

Copper—Sulph. English Wks, ton £20@£21

Copperas—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.

Cream of Tartar—Am. 99% 22½
Powdered, 99 p. c. 23

Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb. 3¼@3½

Feldspar—Ground, ℔ ton 15.00

Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb. 1¾@2

Gypsum—Calcined, ℔ bbl. 1.25@1.50

Iodine—Resublimed 2.75

Kainit—℔ ton 9.75@10.00

Kaolin—*See China Clay.*

Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb 8½@8¾
Acetate, or sugar of, white 12@13

Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½

Litharge—Powdered, ℔ lb. 6¼@6¾
English flake, ℔ lb. .9@9½

Magnesite—Greek, ℔ ton 20.00

Manganese—Crude, per unit .23@.28
Oxide, ground, per lb 2½@6½

Mercuric-Chloride — (*Corrosive Sublimate*), ℔ lb. 70@72

Mineral Wool—℔ lb. 2

Mica—In sheets according to size, 1st quality, ℔ lb. .25@$6 00

Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill 30.00
"J. F. L. S.," ℔ lb. ex dock 2½

Phosphate Rock—S. Carolina, per ton f. o. b. Charleston 5.50@6.75
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00

Phosphorus—℔ lb. 70@75

Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7

Potassium—Cyanide, ℔ lb. .39@40
Bromide, ℔ lb. .33
Chlorate, ℔ lb. 13@14
Carb, ℔ lb. 4.70@5.50
Caustic, ℔ lb. 7½@8
Iodide. 2.65@2.70
Muriate, ℔ 100 lbs. 1.80
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb 10½@11
Sulphate, ℔ 100 lbs. 2.30@2.35
Yellow Prussiate, ℔ lb. 17½@18
Red Prussiate, ℔ lb. 42@45

Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾@2
Powdered. pure, ℔ lb. 2¼@2½

Pyrites—Non-cupreous, p. units 10d

Quartz—Ground, ℔ ton 14 00@16.00

Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb 6@10

Salt—Liverpool, ground ℔ sack 75@80
Turk's Island, ℔ bush 2 @2

Salt Cake—℔ lb. 60@62½

Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb 6@8

Soda Ash—Carb., 48% 100 lb. 1.40
Caustic, 48 % 1.25
Soda Caustic, 60% 2.55
" " 70% 2.37½@2.45
" " 74-6% 2.37½@2.45
Sal, English, ℔ 100 lbs. .95@1.00
Sal, American, ℔ 100 lbs .90
Nitrate, 100 lbs. 1.90@1.95

Strontium—Nitrate ℔ lb. 9@9½

Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb 2
Crude Brimstone, 2s., ℔ ton 19.75
Crude Brimstone, 3ds, ℔ ton. 19 00

Talc—Ground French, ℔ lb 1¼@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton £4 5

Vermillion—American, ℔ lb. 61
English, ℔ lb. 82@85

Vitriol—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb 7

Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb 6½@7
* Spot

THE RARER METALS.

Aluminum—(Metallic), ℔ lb. $2.@$4.00
Sheet, per lb. 6.00@8.00

Arsenic—(Metallic), per lb. .40

Barium—(Metallic), per gram $4.00

Bismuth—(Metallic), per lb. 2.75

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 lb. 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—(Metallic), per oz. 7.00

Lanthanum—(Metallic), per gr. 10.00

Lithium—(Metallic), per gram. 10.00

Magnesium—Per lb. 4.50

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—(Metallic), per oz. 9.00

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. 2.50

Strontium—(Metallic), per gm. .60

Tantallum—(Metallic) per gram 9.00

Tellurium—(Metallic) per lb. 5.00

Thallium—(Metallic) per gram. .25

Titanium—(Metallic) per gram. 2.25

Thorium—(Metallic) per gram. 17.00

Tungsten—(Metallic) per oz. 2.25

Uranium—(Metallic), per lb. 5.00

Vanadium—(Metallic), per gm. 22.00

Yttrium—(Metallic), per gram. 9.00

Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000 3.25@4.00
Jerseys, ℔ 1,000 5.50@6.50
Up Rivers, ℔ 1000 6.25@7.00
Haverstraw seconds, ℔ 1000 6.75@7.00
Haverstraw firsts ℔ 1,000 7.00@7.25
Fronts, nominal, ℔ 1000.
Croton 14.00@16.00
Wilmington 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore

Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu.ft 45@1.25
Granite, Scotch ℔ cu ft. 1.00@1.15

Cement—Rosendale, ℔ bbl .85@1.10
Portland, American, ℔ bbl 2.15@2.45
Portland, foreign, ℔ bbl 2.30@2.40
Portland, " special brands. 2.45@2.75
Roman, ℔ bbl. 2.65@2.85
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.00@8.25

Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black, roofing, ℔ 100 sq. ft. 4.25@5.00

Lime—Rockland, common ℔ bbl. 1.00
Rockland, finishing, ℔ bbl. 1.20
St. John, com. and finish, ℔ bbl. .90@.95
Glens Falls, com. and fin., ℔ bbl .85@1.10

Labor—Ordinary, ℔ day 1.50@2.00
Masons, ℔ day 4.00
Plasterers, ℔ day 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day 2.50@3.50
Stonesetters, ℔ day 3.50@4.00
Tilelayers, ℔ day 3.50@4.50
Bricklayers, ℔ day 4.00