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THE American Society of Civil Engineers has promptly appointed a committee to examine and report upon the Conemaugh dam and the cause of its failure. This committee is composed of the following distinguished engineers: Mr. MAX J. BECKER, President of the Society; ALPHONSE FTELEY, JAMES B. FRANCIS and WILLIAM E. WORTHEN.

At a discussion of the accident at the rooms of the society, on the 5th inst., several of the members who had seen the dam expressed their opinions and condemned the use of clay dams in such positions.

On another page will be found the statement, full, clear and explicit, of Mr. JOHN G. PARKE, the engineer in charge of the work.

SHAFT-SINKING BY THE POETSCH FREEZING METHOD.

The Poetsch-Sooysmith Freezing Company, of New York City, have just completed the first work done by the freezing process in America. As our readers are aware, this process consists in placing a series of vertical pipes in a circle about the space to be excavated. These pipes are closed at the bottom, and a cold brine is circulated through them, which soon freezes the surrounding earth, and so changes it in character that it becomes like a solid rock, through which the excavation may be conducted without the great difficulties which have thus far frequently made the sinking of shafts in running sand extremely difficult. This first success was a shaft sunk through quicksand for the Chapin Mining Company at Iron Mountain, Mich. It was about 15 feet square and 100 feet deep to the ledge. Considerable trouble was experienced toward the close of the work on account of springs coming up in the ledge itself. The company is now putting down pipes for a similar shaft in the Wyoming Valley, Pa. Considerable money has been spent in efforts to reach the extensive beds of anthracite coal in this vicinity. The pipes will be extended several feet into the solid rock, and it is hoped that this will prevent the reoccurrence of the trouble from springs coming through the ledge. The adoption of this process in the United States will make possible the opening of many mines in localities where quicksands or seams of water have thus far proved insurmountable obstacles.

THE CONEMAUGH DAM.

We have made further investigation and have been favored with the following reliable information concerning the dimensions and construction of the fatal dam:

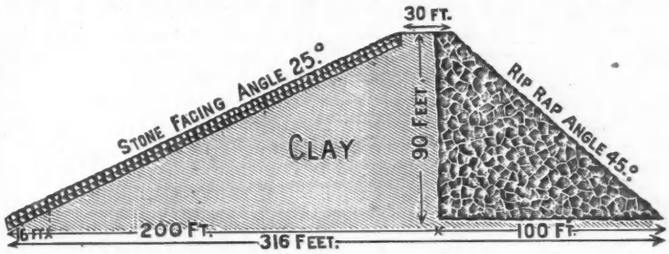
"The South Fork, or Conemaugh dam, nine miles from Johnstown, was built by the State as a feeder to the canal and was completed in 1851. As originally built across the valley it had a width of base of 320 feet and 30 feet on the crown, with a height of 90 feet at the center face, the outside slope being forty-five degrees and the inside slope twenty-five degrees.

"The dam was built of puddled clay faced inside with stone and with riprap of great stones on the outside, the proportion being 200 feet of clay and 100 feet of riprap, diminishing with the slope. The length of the dam was 850 feet. The culvert was 12 feet diameter and in its center was the regulating pipe.

"This dam was abandoned after the sale of the canal by the State, and the culvert and adjacent parts were washed out. The dam was subsequently reconstructed by the South Fork Fishing Club in 1882. The culvert was closed up with solid stone, filled in with dirt back.

"This dam was 75 feet high, and had a waste weir 40 feet wide by 10 feet deep cut in the solid rock.

"The dam did not burst, but the water rose so rapidly that the waste weir could not carry it off, and it overflowed and washed out a gap in the dam 325 feet wide on top and 175 feet at the bottom. The lake above the dam was 2·9 miles long by ¼ mile in width, with a maximum



CROSS SECTION OF THE OLD CONEMAUGH DAM.

depth of 60 feet, and an average depth of 45 feet." This volume of water was discharged, according to the evidence of the engineer in charge, Mr. JOHN G. PARKE, in 45 minutes.

From all this information it is seen that the dam did not burst; that its strength was sufficient for the work it had to do; that it was lower than the old dam, and was provided with a waste weir of large, though, as events show, insufficient dimensions. The washing out of the dam was not unexpected; for hours the engineer saw that it was inevitable, since the water had risen above the crown of the dam, and was flowing over it, and this, in the impossibility of increasing the waste weirs, made the failure of the dam by washing out merely a question of time. The engineer sent men and rode himself down the valley, warning the people that the dam was breaking. Many not only saved themselves, but their furniture, and those in Johnstown had abundant time after the warning to have escaped, but they did not realize the effect of such a flood, and remained in the houses, no doubt expecting a flood, but not a torrent and a deluge. The damming up of the water against the stone bridge, no doubt was the cause of a very large part of the loss of life.

Insufficient overflow weirs and the material of which the dam was built seem to have been the chief defects in the structure, which was strong enough. No engineer should think of building an earth dam at such a point, and had this dam been built of rock the overflow would not have worn it away.

An earth dam has appropriate places, but one of them certainly is not just above a thickly inhabited valley.

THE AMERICAN CHEMICAL SOCIETY.

In 1874 the centennial of the discovery of oxygen was celebrated at PRIESTLEY'S grave in Northumberland, Pa., by a distinguished gathering of American chemists. The idea of a permanent organization advanced by Dr. H. CARRINGTON BOLTON failed of action then, but it resulted in 1876 in the formation of the American Chemical Society in New York City. Its first president was the eminent JOHN W. DRAPER, and he was followed by Dr. J. LAWRENCE SMITH, and later Prof. CHARLES F. CHANDLER and Dr. JAMES C. BOOTH filled the Presidential chair. For a year or so the society flourished, but owing to lack of interest in its meetings the more prominent of the New York members failed to appear with any great regularity, and the active management of the society fell into the hands of a number of German chemists, who, fancying themselves the elect, ran the society so that its membership soon dwindled and its proceedings became of little value. This condition of affairs has since continued. Some two or three years ago the matter was brought up at a meeting of the American Association for the Advancement of Science. It was found that the literature of chemistry was being scattered in various places, that certain papers appeared in the *American Chemical Journal*, others in the *American Journal of Science*, still others in the *Journal of Analytical Chemistry*, established in Easton, Pa., while only a very few were published in the *Journal of the American Chemical Society*, and in consequence a chemist in order to keep himself posted on the progress of his specialty must of necessity subscribe to four or five

journals, when as a matter of fact his slender income scarce permitted such extravagance. Washington, with its numerous government officers interested in chemistry and the success attendant on the various scientific societies that flourish there, at first seemed the proper place to establish a National Chemical Society, but the idea was one that it was feared would not be altogether satisfactory, and it was thought that it would be better if the old title of American Chemical Society could be taken up and new influences brought to bear to make that society national in lieu of provincial. It has been suggested that possibly its constitution might be so altered as to permit the annual meeting to be held in conjunction with the gathering of the American Association, when there would be many chemists from various parts of the Union gathered together, so that its meeting would be in every sense a national one. This view we heartily indorse. Let the old name of the "American Chemical Society" be retained, instead of organizing a new National Chemical Society, and let it hold its annual meeting with the American Association, as is the habit with certain other scientific societies, and retain its local headquarters in New York city. A committee has been appointed to consider this matter at the Toronto meeting of the American Association, and delegates from the American Chemical Society and from the Chemical Section of the Franklin Institute have been appointed to meet and discuss the matter. It is to be hoped that other societies may likewise appoint members to confer on this subject, for there is no reason why there should not, in this great country, be an American Chemical Society that would rival the Germany Chemical Society of Berlin, or the Society of Chemical Industry in England, and become, like those became, potent factors in promoting the development of the chemical industry.

THE JOHNSTOWN DISASTER.

In another part of this number will be found an account of the overwhelming disaster caused by the bursting of the dam at Conemaugh Lake, together with a topographical map of Johnstown and vicinity prepared under the supervision of Mr. JOHN FULTON, General Manager of the Cambria Iron Company. We are deeply grateful that a dispatch, received while we write, relieves us from the pang of saying, as we had expected, "the late JOHN FULTON." But we can scarcely hope that equally good tidings will come concerning all of the many friends of the JOURNAL and its editors whom the great industries of Johnstown had gathered at that place. We await with sad anticipations the more precise details which may add many a personal grief to our sorrowing sympathy with the multitude of our afflicted fellow-men.

Editors, as well as reporters, have exhibited both the strength and the weakness of the press. In stimulating, both by news and by direct appeal, the instant help of whole communities; in thrilling all men with impulses of sympathy;—what other agency could have wrought such miracles of power? But, on the other hand, in explaining, denouncing, demanding, and "drawing morals," what could be more reckless and superficial than the average editorial has been? Whatever may turn out to be the real facts and merits of this case, it is clear that the flippant conclusions of newspaper editors are mere fancies, based on ignorance, and revealing, too often, the mischievous spirit of alarm and attack, on general principles of "journalistic policy."

Thus we have leading newspapers demanding that all reservoirs and dams shall be abolished hereafter; and others renewing the old and oft-defeated opposition to the Quaker Bridge dam reservoir, which is an essential part of the New York acqueduct system, and the delay in constructing which is going to make the city wait long for the full benefits of the large expenditure it has already made. We shall try to avoid the errors of our more frequent, and therefore more hasty contemporaries of the daily press, and neither to condemn without evidence nor alarm without reason in the general comments suggested to us by the accounts thus far received of the Johnstown catastrophe.

1. The general scientific lesson of such events is the danger of all interferences with the balance of natural forces. Nature's equilibrium is not mere rest; it is tension. Man's operations must disturb it; but the ultimate consequences of such a disturbance should be borne in mind. There can be no question that the increased frequency and magnitude of the floods on the rivers traversing the Alleghanies is the result of a reckless and rapid destruction of the forests along their tributaries. It is the simultaneous quick rise of a hundred little streams that does the harm; and it is the denudation of the mountain sides that permits this sudden rise, and thus creates the flood. It may seem heartless to say it,—and we do not say it in the spirit of blame toward a stricken community,—but the devastation wrought at Williamsport, "the center of a vast lumbering trade," has swept away the wealth which was accumulated in deliberately preparing just such a catastrophe.

2. Nature's channels, carved out to suit the requirements of the former condition, are not adequate to this new demand; and man everywhere makes them smaller instead of larger. We venture to say that every river in Pennsylvania, which flows by blast-furnaces, has had the maximum capacity of its channel encroached upon by slag-dumps. Certainly this was the case with the Conemaugh at Johnstown, although it cannot be said to have played any important part in the destruction wrought by the flood. Yet it might have been an element of trouble if far more serious elements had not swallowed up its effects. It is, however, not only such things as slag-dumps, but all sorts of embankments and constructions (such as inevitably line the banks of rivers where villages grow to be great cities, without being at any time laid out with wise forethought of their future growth), which narrow the channels of natural drainage and make freshets more destructive. We have never before had to record so terrible a result as this, and we hope we may never record another. But the annual waste of property, though not of life, which our newspapers report every spring and fall, as a matter of course, when the "usual" rise of the streams occurs, amounts in a generation to a greater aggregate loss than even such a ruin as this.

3. We are inclined to hope that the extension of railroad transportation, diminishing, as it has done, and will do yet more greatly, the commercial importance of rivers, will operate against the concentration of cities and of dense buildings and populations on river banks. It will be found possible to leave the rivers room, when room is not worth so many dollars per square foot as it has been on river fronts. But bridges will be more numerous than ever, and this brings us to the most important point suggested by our text—a point, moreover, concerning which we have seen no suggestions in the newspapers.

4. No intelligent reader of the reports from Johnstown can fail to see hat the most terrible element of destruction was furnished by the bridges swept down by the flood, and above all, by the massive stone bridge of the Pennsylvania Railroad Company, below the city, which caught and held all accumulating *débris* from above, and formed an awful improvised dam to prevent the escape of the waters, and to drown thousands whom the torrent itself, however wild, might have spared. A bridge carried down by a freshet is more dangerous than anything else. Its long trusses reach and crush what logs, houses and other *flotsam* might miss. The engine of death at Johnstown was not merely water, but water loaded with a wild confusion of solid materials, collected and reinforced by the wrecks of bridges. And the bridge that did not give way, but stands to-day unharmed in its massive strength, wrought most ruin of all.

It is under ordinary circumstances of grade, almost inevitable that the arches of a stone bridge will give inadequate passage for a large flood. And it is quite certain that bridge-wrecks will catch cross-wise on the piers and thus begin the rapid accumulation of other *débris*. One of the editors of the JOURNAL, who has come down the Susquehanna in a row-boat on this last and greatest flood, at its maximum, can testify to repeated instances in which the fragments of one bridge may thus be seen to-day, lying across the remains of another. It is not only in cases of such disaster, however, but every year when the ice moves, that low-lying stone bridges work mischief by forming dams which threaten to drown out what is above them before they give way, and destroy what is below them afterwards.

This, too, is a result of interference with nature's adjustments. When her valleys were big enough for her rivers, our bridges gave proportionally adequate passage. Now that we have both contracted the valleys and swelled the floods, our bridges become perilous and unmanageable. It is said that the Pennsylvania Railroad Company has been for some years steadily removing its iron bridges and substituting stone ones. For everything below such a structure it would be a protection, and even if it gave way it could not contribute floating wreck for further damage. But we think no such bridge should stand below a city which could be drowned by any rise of water which it might cause. It is not merely the height of the top of the bridge which needs to be considered, but the possible accumulation of a higher mass caught by the bridge, and then the depth of water pouring over the whole.

Another wise man talks about an earthquake. We can reassure him, partially, at least. What an earthquake might do, we cannot undertake to predict, but nothing that any earthquake is known to have done would burst a dam of masonry and cement, constructed as the plans of the Quaker Bridge dam indicate.

Finally, the loss of life in any such case can undoubtedly be prevented. It is sad enough to read of the people at the Conemaugh dam sending off messenger after messenger for hours before the final catastrophe, and of such pitiful substitutes for the electric wire as men on horseback. There was time enough to save all the lives which have been sacrificed, if there had been a telegraph, and a known official at each station whose warning would have been heeded at once. This is just what there would be along a system of reservoirs like that proposed for this city. The attempt to argue from the Conemaugh disaster that similar perils exist in cases not similar, and that they are so great as to make adequate protection impossible, is unreasonable. Isolated, relatively neglected and disregarded reservoirs

have burst with awful consequences, when there were no means at hand either to counteract the danger nor to spread the warning. But we can recall no case in which a substantial work, constantly watched and tended, and part of a thorough municipal system in daily use under competent engineers, provided with complete and instantly available relief channels, in telegraphic communication day and night from one end to the other, and with every part of the water-shed supplying it, as well as with all towns and villages below it, has taken the world by surprise in any such fashion. *

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.

Arizona Copper Practice.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of the 11th inst. you publish an article on the operations of Arizona copper producers, and in it is explained how the Arizona Copper Company disposes of its slag, viz., by granulating and sluicing it. From the remarks made one might suppose that this mode of treating slag is something novel, but there is nothing new under the sun, and you will find that it has been in use for some time both in Montana and at other points.

As to the bricking of slag referred to in the same article, I think the result should not be unsatisfactory. My experience has been satisfactory; much of course depends on the nature of the slag, and the bricks themselves should be handled as little as possible and laid in place quickly.

EL PASO, May 27. J. F. S.

[In our previous mention of this system, January 19th, we referred to it as having been already practiced for many years.—ED. E. & M. J.]

The Effects of the Tariff on the Price of Potash Fertilizing Salts.

EDITOR ENGINEERING AND MINING JOURNAL:

DEAR SIR: In the report on fertilizing chemicals on page 512 of your valued paper of last Saturday, June 1st, you publish the remarks of a gentleman who favors the retention of the duty on high grade manure salts, containing 90 to 98 per cent sulphate of potash. The gentleman in question naturally has a right to his opinion, and may favor or oppose the maintenance of the duty at his pleasure, but he ought to abstain from asserting that the German Syndicate will raise the price of this article if this government should remove the duty. We have been untiring in our efforts to have the duty taken off, so as to bring this very desirable manure salt within the reach of every fertilizer manufacturer, and it was our litigation against the government on this point which has just resulted in our favor. We are ready to go on record with a guarantee that neither the potash syndicate nor the importers thereof will sustain the present high prices of sulphate of potash, any remarks of your informant to the contrary nothwithstanding. Yours very truly,

164 FRONT STREET, New York, June 6, 1889. HELLER, HIRSH & CO.

VANADIUM: ITS OCCURRENCE AND USES.

The element vanadium was discovered in 1830 by Sefström, a Swedish chemist, who found it in the iron of Talberg, and it derives its name from Vanadis, one of the titles of the Scandinavian goddess, Freia. The metal itself is a light, whitish-gray colored powder, which under the microscope reflects light most powerfully, and appears as a brilliant crystalline metallic mass, possessing a silver-white lustre. It is a rare substance, forming an essential constituent of only a few scarce minerals. Traces of this element are, however, tolerably widely distributed through terrestrial matter, and it exists in the sun.

The principal vanadium minerals are vanadinite, or lead vanadate; dechanite, a vanadate of lead and zinc; descloizite, a compound of vanadium and lead; purcherite, a bismuth vanadate; psittacinite, consisting of lead, copper and vanadic acid; volborthite, a copper calcium vanadate; roscoeiite, a vanadium mica, and mottramite, a vanadate of lead and copper. Traces of vanadium have also been found in a large number of clays, in trap and basalt, in certain iron ores and cast iron, and also in soda ash, as well as in phosphate of soda, the latter in one instance containing as much as 0·2 per cent. Vanadium minerals exist in many places in this country. The first occurrence seems to have been noted by J. E. Teschemacher in yellow crusts on the native copper of Lake Superior. Later, in January, 1875, Dr. A. A. Hayes, in a paper read before the American Academy of Arts and Sciences, drew attention to the general occurrence of vanadium in the trap and slate rocks of this country. In 1876 Dr. Isidor Walz presented a paper before the American Chemical Society, in which he indicated the presence of vanadic acid in some magnetic iron ores from New Jersey that he had anylyzed. He said at that time: "I have examined about twenty different magnetic iron ores from as many different localities in seven different States, and with two or three exceptions, in which the indications were too faint to be relied upon, I found vanadium in all of them, in proportions varying from mere traces to 0.4 per cent. Dr. James Blake, of San Francisco, discovered a mineral in a gold mine at Granite Creek, El Dorado County, Cal., in the lowest hills on the western slope of the Sierra Nevada, which he named roscoelite, in honor of Prof. (now Sir) Henry Roscoe, of Owens College, Manchester. Analyses by Prof. Frederick A. Genth, of the University of Pennsylvania, showed that it contained 22 per cent of oxide of vanadium. Vanadium, in combination with lead, forming the minerals dechenite and descloizite, occurs sparingly in the Evening Star and some other mines in Leadville, Col., and in orange red crystals in the ores from the Merritt mine in the Socorro Mountains, four miles west of Socorro, N. M. All varieties of the red and brown vanadates are known to exist in Pinal, Yuma, Mohave and Maricopa counties, in Arizona. Vanadium minerals are also found in Montana, The Mammoth gold mines, fifty miles north of Tucson, A. T., contain all forms of vanadate of lead, which were discovered there in 1885 by Charles R. Fletcher. This gentleman sent specimens to Prof. Frederick A. Genth for examination, who recognized them as the vanadate of lead and zinc. Vanadinite has also been discovered in the Black Hills, Dakota, and various minerals containing vanadium have been found in Mexico.

According to Roscoe, the methods adopted for the preparation of vanadium from its various sources depend upon the fact, discovered by Sefström, of the existence of an insoluble ammonium metavanadate, which by repeated crystallization can be freed from phosphorus and other impurities. The mottramite which was worked at Alderley Edge and Mottram St. Andrews, in Cheshire, England, yielding the vanadic acid of commerce that was manufactured near Manchester, used the following process:

The sandstone, which contains the mineral deposited as a film on the surface of the grains of sand, is digested with strong hydrochloric acid, the acid liquor drawn off and the sand well washed with water. The acid solution, together with the washings, after concentration, is evaporated down with an excess of sal-ammoniac, until ammonium meta vanadate separates out, and this is repeatedly crystallized to free it from copper and iron. The crude ammonium meta-vanadate is then gently roasted in porcelain, by which means the vanadium pentoxide is obtained in a tolerably pure condition.

In order to purify this it is suspended in water and ammonia gas passed into the liquid. A solution of ammonium vanadate is thus formed and separated by filtration from the residue containing silica, phosphates, etc., and then crystallized by evaporation in platinum vessels; the pentoxide obtained by several repetitions of this treatment is free from phosphorus. Another method for obtaining vanadium pentoxide consists in the preparation of the pure oxychloride, which, when decomposed by water, yields the acid as a fine orange-colored powder. In order to free this from any trace of obstinately adhering silica it is moistened with sulphuric acid and exposed in a platinum vessel for some days to the action of hydrofluoric acid. After expulsion of sulphuric acid and fusion fine large transparent crystals of chemically pure vanadium pentoxide are obtained. The concentrates, containing about 85 per cent of vanadium minerals, were sold by the Mammoth Mining Company, previously referred to, to a Philadelphia company at 12½ a pound in Arizona. Their process of manufacture is not known to us.

Berzelius, who was one of the early workers on vanadium compounds, observed that the alkaline vanadates mixed with an infusion of galls produced a blue black ink, indestructible by acids and most other chemical agents. Roscoe discovered that vanadium oxide is a powerful reducing agent, and made experiments on its action upon colored solutions.

In October, 1871, Robert Pinkney took out a patent in England for the use of vanadium salts for producing aniline black, and in December, 1874, he procured a further patent for using vanadium salts with vegetable and animal coloring matters. Early in 1876, A. Guyard showed that if a mixture of water, chloride of aniline, and a chlorate be made, and a small quantity of vanadous chloride be added, the solution begins at once to darken, and in a few hours almost the whole of the aniline is transformed into aniline black. He further found that the vanadium was so powerful that one part of it could easily transform 1000 parts of chloride of aniline into aniline black; and that in practice one part of either the chloride or the vanadate of ammonia could be successfully employed to 500 parts of the aniline salt. Gouillon subsequently reported that a satisfactory result would be obtained by the use of five milligrams of vanadium salt to one liter of the dyeing liquid, or one part of vanadium to 20,000 of the aniline salt. Witz, a German chemist, repeated these experiments, and in general confirmed the previous results, except that he considered the proportions of vanadium as still too high. The satisfactory nature of these experiments resulted in its application to calico printing, and since that time (1877) its use has been more or less prevalent. Besides the English company referred to, a company was organized in Stockholm, Sweden, for the manufacture of vanadium salts from the Swedish iron ores. It was used to a certain extent for the manufacture of ink; but while it produced a satisfactory article, its tendency to decompose led to its abandonment. It has also been found that a sheet of paper passed through a solution of a salt of vanadium and exposed to the sunlight yields a well-defined picture on treating with salts of uranium. A compound of vanadium and silver, treated in the same manner, gives, with ferrous sulphate, a clear picture. Potassium bivanadate, in contact with organic matter, turns green and then blue on exposure to sunlight. Thus it has been proved of value in its application to photography.

That vanadium and its salts are poisonous is well known, and its action was very carefully studied by Professor Gamgee, who, in 1875, presented the results of his experiments as to its physiological action on various animals to the Royal Society. It is accepted that vanadium salts produce local as well as general paralysis of the motor nerves, together with convulsions, decreased temperature, intermittent respiration and feeble pulsation. Potassium ferrocyanide is recommended as an antidote, as it forms a precipitate with vanadium salts in acid solutions. Tannic acids would also act similarly.

The salts most commonly used are the ammonium vanadate, the vanadium chloride, the vanadium pentoxide and the metavanadic acid. The last was discovered in 1873 by Gerland, and forms a fine yellow pigment sometimes termed vanadium bronze; this is employed in place of gold bronze. Both vanadic acid and the vanadate of ammonia are imported into this country in small quantities, but their application has never become very great. At present not more than 50 pounds in all are imported annually. Metallic vanadium sells at $22 for 15 grains; the chloride at $3 an ounce; the ammonium vanadate, $2 an ounce for the pure and $1 an ounce for the commercial variety, and the meta vanadic acid at $8 an ounce for the pure quality, and $3.50 for the ordinary grade.

New Use of Glycerine.—Carpenters and other tool-users who keep up with the times now use a mixture of glycerine, instead of oil for sharpening their edge tools. Oil, as is well known, thickens and smears the stone. The glycerine may be mixed with spirits in greater or less proportion, according as the tools to be sharpened are fine or coarse. For the average blade two parts of glycerine to one of spirits will suffice.

THE JOHNSTOWN DISASTER AND THE CAMBRIA IRON COMPANY.

The awful calamity which has befallen the inhabitants of the Conemaugh Valley calls for a description of the locality and of the Cambria Iron Company's works, on the prosperity of which Johnstown was built up. Johnstown is situated at the foot of the western slope of the Allegheny Mountains in a deep level cutting, at the junction of Stony Creek and Little Conemaugh River, which unite at this place to form the Conemaugh River, a tributary of the Allegheny. The slopes of the hills surrounding Johnstown have been cut through the coal measures, which here contain five seams of coal and a valuable bed of carbonate of iron. Including the surrounding boroughs of Curnville, Morrellville and Cambria City, all of which join Johnstown proper, the population of the district was about 30,000. The Cambria Iron Company employed in Johnstown about 7500 people, which would indicate a population of not less than 20,000 depending upon the company for a livelihood.

Our illustrations show a map of Johnstown and the surrounding district, and the works of the Cambria Iron Company. The dam, about 9 miles above Johnstown in the valley of the Little Conemaugh River, which will be seen in the lower right-hand corner of the map, was originally completed in 1851 for the storage of water for the Pennsylvania Canal, Chief State Engineer Robt. Morris having charge of the work, and was at that time about 90 feet in height in the center. Even then it was regarded as a danger to the valley below, and it is said that on one occasion the water was let off to avoid disaster in time of flood. After the construction of the Pennsylvania Railroad the canal was disused, and during its abandonment the canal culvert and adjacent parts were washed out.

In 1882 the South Fork Club, of Pittsburg, decided to convert the reservoir into a lake for fishing, and a hotel and cottages were built on its banks, forming a favorite summer resort. By closing up the culvert with solid stone, filled in with a dirt back, a sheet of water was formed about 3 miles long and from 1000 feet to 2000 feet wide. The length of the dam was about 850 feet, and 30 thick at the top, and at the bottom about 300 feet, but the work of re-building is said to have been executed in an indifferent manner. In addition to this it seems that the dam was deficient in sluice gates and other arrangements for disposing of surplus water.

On one side of the dam a waste weir, 40 feet in width and 10 feet deep, was cut in the solid rock. The large gap in the center of the dam was filled in by the South Fork company simply as an earthen embankment, wagon loads of earth and shale being tipped in until a level surface was gained, as was stated by Mr. Brendlinger at the meeting of the Society of Civil Engineers on Wednesday evening. From time to time in heavy floods there has been fear on account of the insecurity of this work, but on Thursday night the engineer of the company, Mr. Parke, C. E., who was on the spot, was in no way uneasy, we leave him to describe what occurred, as published by the Pittsburg *Commercial:* "On Thursday night the dam was in perfect condition, and the water was not within seven feet of the top. At that stage the lake is nearly three miles long. It rained very hard Thursday night I am told, for I slept too soundly myself to hear it, but when I got up Friday morning I could see there was a flood, for the water was over the drive in front of the club-house, and the level of the water in the lake had risen until it was only four feet below the top of the dam. I rode up to the head of the lake and saw that the woods were boiling full of water. South Fork and Muddy Run, which emptied into the lake, were fetching down trees, logs, cut timber and stuff from a saw-mill that was up the woods in that direction. This was about 7:30 o'clock. When I returned, Col. Unger, the President of the club, hired twenty-two Italians and a number of farmers joined in to work on the dam. Altogether thirty men were at work. A plough was run along the top of the dam, and earth was thrown in the face of the dam to strengthen it. At the same time a channel was dug on the west end of the dam to make a sluice-way there. There was about three feet of shale rock through which it was possible to cut, but then we struck bed-rock that it was impossible to get into without blasting. When we got the channel opened, the water soon scoured down to the bed-rock, and a stream twenty feet wide and three deep rushed out on that end of the dam, while the weir was letting an enormous quantity on the other end. Notwithstanding these outlets, the water kept rising at the rate of about ten inches an hour.

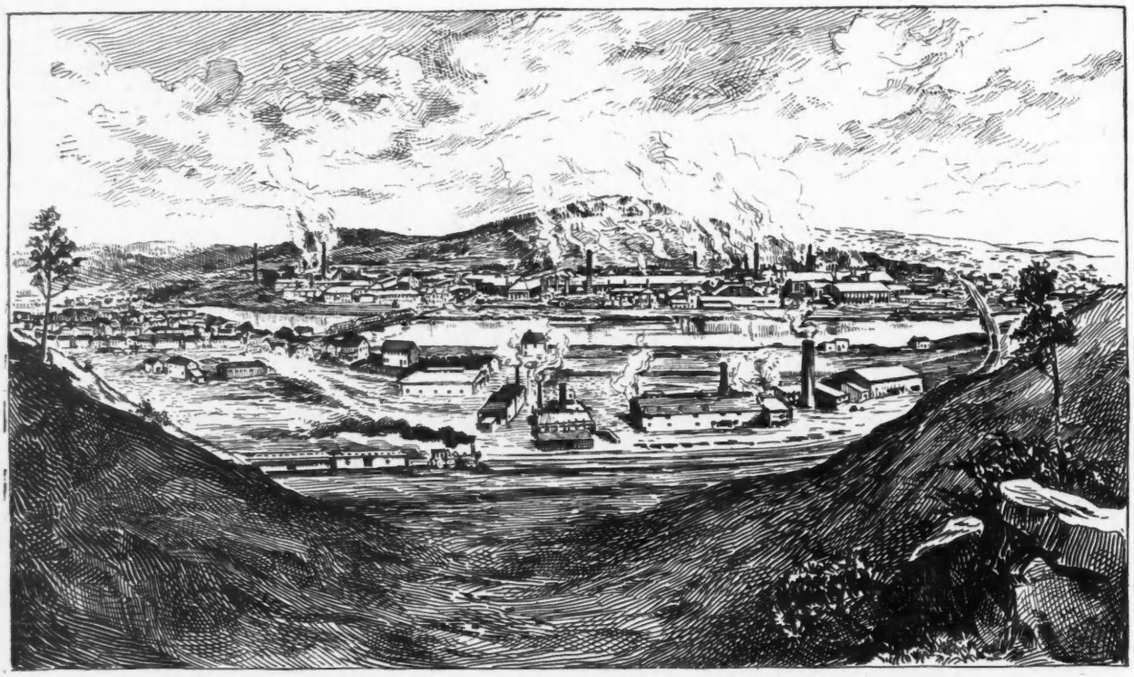
"By 11:30 I had made up my mind that it was impossible to save the dam, and getting on my horse I galloped down the road to South Fork to warn the people of their danger. The telegraph tower is a mile from the town, and I sent two men there to have messages sent to Johnstown and other points below. I heard that the lady operator fainted when she had sent off the news, and had to be carried off. The people at South Fork had ample time to get to the high grounds, and they were able to move their furniture too. In fact only one person was drowned at South Fork, and he while attempting to fish something from the flood as it rolled by. It was just twelve o'clock when the telegraph messages were sent out, so that the people of Johnstown had over three hours' warning.

"As I rode back to the dam I expected almost every moment to meet the lake coming down on me, but the dam was still intact, although the water had reached the top. At about one o'clock I walked over the dam; at that time the water was three inches deep on it, and was gradually eating away the earth on the outer face. As the stream rolled down the outer face it kept wearing down the edge of the embankment, and I saw it was merely a question of time. I then went up to the club-house and got dinner, and when I returned I saw that a good deal more of the outer edge of the dam had crumbled away. The dam did not give way. At a rough guess I should say that there were sixty millions tons of water in that lake, and the pressure of that mass of water was increased by floods from two streams pouring into it, but the dam would have stood it could the level of the lake have been kept below the top of the dam. But the friction of the water pouring over the dam gradually wore it away from the outer face until the top became so thin that it gave way.

"The break took place at three o'clock. It was about ten feet wide at first and shallow, but now that the flood had made a gap, it grew wider with increasing rapidity, and the lake went roaring down the valley. That three miles of water was drained out in 45 minutes. The downfall of those millions of tons was simply irresistible. Stones from the dam and boulders in the river bed were carried for miles. Trees went down like you might cut a mullein stalk with a swish of your cane"

The contents of Conemaugh Lake poured down the valley with appaling force and swept away the villages of South Fork, Mineral Point, Conemaugh and Woodvale before reaching Johnstown, where the destruction was increased enormously by the damming up of the water by the debris carried down against the stone bridge of the Pennsylvania Railroad, the position of which can be seen where the railroad crosses the stream below the junction of Stoney and Little Conemaugh rivers. The horrors of the flood were intensified by a fire which broke out in the mass of houses jammed against the bridge by the water, and many persons imprisoned in the wreck were burnt to death.

The upper part of Johnstown is described by an eyewitness as entirely swept away, while through the lower half a swath of about one quarter mile wide has been cut by the torrent which leveled every building in



CAMBRIA IRON WORKS—DISTANCE ONE AND A HALF MILES.


COAL & IRON ORE MINES
OF
CAMBRIA IRON CO.
JOHNSTOWN, PA. 1885.
Horizontal Scale: 1800 ft.—1 Inch. Contours 30 ft. apart vertically.
COAL MINES
IRON ORE MINES
BORE HOLE
Elevations above tide given in figures.
Jno. Fulton, Jan. 1885.
BENSHOFF ORE MINE
ORE COAL MINE
CAMBRIA CITY
CAMBRIA IRON & STEEL WORKS
EXHAUSTED ORE MINES
BLAST FURNACE MINE
WOODVALE
Pennsylvania Railroad
JOHNSTOWN
ROLLING MILL MINE
GAUTIER STEEL DEP'T
Steel Mill
Wire Mill
Bore Hole
Somerset

its path. As an evidence of the extent to which the water was dammed back by the stone railroad bridge, it is stated that some of the houses which were previously standing near the bridge were found stranded after the water subsided in the upper part of the town.

It will be some time before the exact number of lives lost can be ascertained, but the most recent estimates place it as high as 10,000, and among them some of the brightest and most useful of the employés of the Cambria Iron Company.

THE CAMBRIA IRON AND STEEL WORKS.

The Cambria Iron Company was chartered in the year 1852 for the purpose of operating four old fashioned charcoal furnaces in and about Johnstown, which had at that time a population of 1300 inhabitants. The company had severe struggles for existence in its early years, and in 1855 the works were leased to Wood, Morrell & Co. for seven years, Mr. Daniel I. Morrell, of Philadelphia, being the prime mover in the enterprise and a firm believer in its ultimate success. During this lease, in June, 1857, when the concern had already commenced to grow into importance, the works were reduced to ruins by a fire; but so great was the energy of the men then interested in it that in one week after the fire the furnaces and rolls were again in operation under a temporary structure. At the end of the lease, in 1862, the present company was formed by a reorganization of the former one, and entered upon a more prosperous career.

In 1869 the Cambria Iron Company commenced the erection of Bessemer steel works, and in 1871 sold its first steel rails at the price of $104 per ton. The history of the company from this point shows a constant increase of plant, and about ten years ago arranged a partnership with Dr. I. H. Gautier & Sons, of Jersey City, under the name of the Gautier Steel Company, to manufacture at Johnstown wire rods and other forms of merchant steel. Within less than a mile from the main works extensive mills were erected, and the business soon grew to great proportions. In a few years this was absorbed entirely by the Cambria Iron Company and was known as the Gautier Steel Department.

The blast furnaces, steel works and rolling mills were situated upon what was originally a river flat, where the valley of the Conemaugh expanded somewhat just below the borough of Johnstown, the consequence of which is that both the iron and steel works were entirely ruined by the recent flood. Now as in 1857, however, courage, energy and financial resources are not wanting, and we are informed by the company that the reconstruction of the works will be commenced without delay. The number of furnaces was six, 1, 2, 3 and 4 forming a complete plant, with stacks seventy-five feet high, sixteen feet bosh. There were forty boilers fired by furnace gas, to operate eight vertical direct-acting blowing engines. The blast was heated in twelve Whitwell stoves, and the smoke was carried off by two smoke stacks ten feet inside diameter, 232 feet high. Metal from the furnaces could either be poured directly into ladles resting on trucks and run to the Bessemer Works, or cast into pig. Furnaces Nos. 5 and 6 formed a second plant with stacks 75 feet high, and 19 feet diameter of bosh. No. 5 had iron hot blast stoves, and No. 6 four Whitwell fire-brick hot-blast stoves. Thirty-two boilers supplied the steam for six blowing engines. The Bessemer plant was the sixth started in the United States. The main building was 165 feet long by 102 feet wide. The cupolas were six in number, located on either side of the main trough, into which they were tapped, and down which the melted metal poured into a ten ton ladle set on a hydraulic weighing platform. The Bessemer works were supplied with steam by 21 tubular boilers.

The best daily work done in the Bessemer department was 103 heats of 8½ tons each for each 24 hours. The best weekly record reached 4847 tons of ingots, and the best monthly record 20,304 tons. The laboratory for physical tests had a lever-testing machine of 300,000 pounds capacity.

The open-hearth department contained three Pernot revolving-hearth furnaces of 15 tons capacity each, supplied with natural gas. A separate pit with a hydraulic ladle crane of 20 tons capacity is located in front of each pan, with hydraulic cranes for the ingots. One furnace was operated on the Krupp dephosphorization process for special steels. There was one 40-inch blooming train driven by a reversing engine 40 inches diameter, 48-inch stroke, also a new 48-inch blooming train driven by a pair of horizontal reversing engines, 44 inches diameter, cylinders 60-inch stroke. Hydraulic pressure was maintained by a Worthington compound duplex pump, connected with accumulators, giving 350 pounds pressure to the square inch. Twenty-nine tubular boilers were in use for the blooming mill and open-hearth plant.

The rolling mill contained 6 trains from 12 to 24 inches with a product of 80,000 pounds per turn. In addition there were a puddle mill, wire-rod mill, bolt and nut works, axle and forging shops. A ventilating fan supplied 100,000 cubic feet of air per minute distributed throughout the mills. In addition to the boilers already enumerated over the heating furnaces, there were in a separate building 24 tubular boilers aggregating about 2000 horse-power.

The Gautier Steel Department consisted of a brick building, 200 by 500 feet, where the wire was annealed, drawn and finished; a brick warehouse, 373 by 43 feet, shops, offices, &c. The barb wire mill, 256 by 50 feet, where the celebrated Cambria Link barb wire was made; and the main merchant mill, 725 by 250 feet. In 1887 this department produced 50,000 tons of wire and agricultural implement steel.

Grouped with the principal mills were the foundries, pattern and other shops, drafting offices, etc., all structures having been of a substantial character.

The company operates about 35 miles of railroad tracks, owning 24 locomotives and 1500 cars.

Steel Wire Fly-Wheels.—MM. Mannesmann, of Remscheid, Westphalia, are manufacturing fly-wheels capable of double and even treble the speed of fly-wheels made of cast-iron, the resistance of which is generally limited to a speed of 40 meters per second for the rim of the wheel. They have succeeded in obtaining fly-wheels which are capable of acquiring three times the speed of ordinary fly-wheels, by constructing the nave and the spokes of iron or steel, and making a rim entirely of steel wire wound round and round itself a great many times.

SULPHUROUS AND DESULPHURIZED BLAST-FURNACE SLAG.

Written for the Engineering and Mining Journal by A. D. Elbers.

The purpose of this article is to review briefly those conditions of blast-furnace slag which affect its utility most essentially, and to compare the cooling behavior of sulphurous slag with that which the latter would have if it were desulphurized in the fluid condition in which it can be obtained from the blast-furnace.

Blast-furnace slag consists chiefly of more or less uniform compound silicates. It is called sulphurous when it contains sulphides in a state of diffusion. These sulphides, which are mainly those of calcium, form while the silicates are forming, intermix with them, and become more or less evenly distributed throughout their mass in the measure in which the silicates themselves undergo more or less numerous molecular rearrangements The sulphides derive their sulphur mainly from the fuel, but form also from pyrites, and from gypsum and other sulphates: hence the forming and melting slag contains sulphides even when the charge is smelted with charcoal, unless it becomes highly siliceous, when the sulphides are driven out of their position by the silica. The principal reactions which may then be supposed to occur, are that the sulphides, on account of having a smaller molecular weight than the silicates, float to the surface of the molten slag, and are there decomposed by the oxidizing influence of the blast, the sulphur becoming thereby changed to sulphurous oxide, most of which escapes through the mouth of the furnace, while some of it may return its sulphur to the forming slag by becoming decomposed in passing over red-hot coal.

The presence or absence of sulphides is therefore to some extent an indication of the constitutional character of the silicates of which the slag consists. Slag that is not sulphurous is also of no especial utility, but that which is sulphurous can be rendered valuable, provided its composition is suitable in constitutional respects. Slag of such composition is produced at most blast-furnaces when making foundry pig-iron; it is quite thin fluid when it leaves the furnace, and light colored and of stony aspect after it has cooled. In regard to its behavior, such slag may be said to be "hot short" as well as "cold short," if the the latter term may be used to indicate that the physical endurance of the slag is greatly impaired by the sulphides.

Sulphurous slag begins to solidify by coagulating, because the sulphides remain still liquid while the silicates become semi-fluid or "pasty." The coagulated mass remains more or less fluid until the silicates begin to turn rigid, which change takes place at about the same temperature that the sulphides require to maintain their own fluidity. Any additional cooling is apt to cause the mass to chill suddenly, because the heat that keeps the sulphides fluid is only a small portion compared to that which the total mass loses when it cools in the slightest degree. Sulphurous slag is therefore apt to warp considerably in cooling unconfined, and to yield unsound and strained castings when it is poured into molds. It contains, however, usually so much latent heat, when it is quite fresh from the furnace, that the scales, which form almost instantaneously when small quantities of it are poured into a comparatively cool receptacle, will re-melt in the after-poured mass, provided the bulk of the latter is comparatively large. Hence it can be cast, with some degree of success, into easily filling forms, in the shape of solid blocks having a certain amount of bulk and comparatively little surface. Such blocks, when properly annealed, become as tough and durable as the physical and chemical endurance of their weakest parts, the sulphides, will permit; but they are, nevertheless, "cold short," as can be readily ascertained by hammering them in the manner in which blocks of natural stone are dressed.

It stands to reason that the slag will be rendered so much more uniform by desulphurizing in the liquid state that it will, practically, be a mass of amorphous and homogeneous compound silicates, and of corresponding behavior. All fused silicates are more or less "compressible and ductile," or plastic, during some stage of their cooling; those that are high in silica turn more plastic than those that are low in silica, and the latter are less brittle in the cooled state and at ordinary temperatures than the former.

Compound silicates require less intense heat to remain fluid, or have a lower freezing point than corresponding uncombined quantities of the simple silicates of which they consist; and their freezing point adjusts itself according to the relative quantity, specific freezing point and diversity, of the respective simple silicates.

Compound silicates that consist chiefly of simple silicates having a very high freezing point, become plastic at such high temperatures, and solidify so rapidly in a cooler atmosphere, that their plasticity cannot be rendered available in ordinary or open air manipulations.

Compound silicates which have a low freezing point, because all, or nearly all, of their component silicates have, pass quicker through the plastic condition than compound silicates the freezing point of which is equally low, but the result of the combination of simple silicates that differ widely in their freezing point. Ordinary glass, for instance, is an amorphous mass of homogeneous compound silicates which consist, in the main, of about equal proportions of two kinds of simple silicates, the one having its freezing point near white heat, and the other near red heat, or from 800 to 1000 degrees Fahrenheit apart; and its behavior will be found to be entirely in harmony with the rules above stated.

That slag can be desulphurized in the liquid-melted state, by treating it in converters, with chemical re-agents, and in such manner that the finished charge will retain sufficient fluidity to be cast into molds, granulated in water, converted into slag wool, and manipulated in other ways which its new properties will render feasible and useful, will become more apparent after considering the following:

Sulphurous slag that is quite liquid (which it must be when chilled pieces of the same composition re-melt in it) would be just as liquid without the sulphides, because the freezing point of the latter is lower than that of the rest of its mass.

The slag will also remain liquid, while it is being desulphurized, when the loss of heat, which will be occasioned by the introduction of the oxidizing agents, can be counterbalanced by that which will be produced by the combustion of the sulphides, provided the respective physical and chemical reactions follow each other in quick succession.

The freezing or coagulating point of the sulphurous slag, and the

freezing point of the desulphurized mass, can be lowered considerably by the introduction of cheap fluxes having components that will combine constitutionally with the silicates.

Whether slag can be desulphurized in that way, at a sufficiently low cost to render the process of economic importance to the slag producers, will, of course, depend on the means which can be employed, as well as on a skillful combination of details, and perhaps also on the adoption and perfection of devices, the necessity for which may only become apparent in the course of practical trial.

HOBOKEN, June 3, 1889.

UNIVERSAL ROLLING MILLS FOR THE ROLLING OF GIRDERS AND CRUCIFORM SECTIONS.*

In the face of the multifarious applications and the continuously growing use of girders and similar sections, it is a remarkable fact that the quality of this kind of iron has not as yet attained the perfection which nowadays generally is required of rolled iron. With the highly important H iron, people are accustomed to be content with much less strength and a proportionate increase of weight instead, where that is admissible. For bridgework and other iron structures exposed to strains by sudden shocks, and in cases where safety has to be combined with the least weight, built-up girders are always preferred. This is because, by the ordinary system of rolling mills, it is not possible to produce properly worked flanges. The wider and thinner and the less tapered the flanges, the greater becomes the difficulty. This defect can be avoided with channel and sleeper sections by rolling them in a bent state. It makes itself less felt with tees, tee-bulbs, flanged rails and smaller girders. With heavy H girders it is difficult to mitigate this, as in order that the rolled bar may easily fit into the next groove, the latter is always somewhat wider than the previous one. In this way sections are obtained of increasing width, and no pressure can be exerted upon the outer surfaces of the flanges, and their width cannot be much reduced. Therefore the inner surfaces alone offer a point of attack for reducing their thickness.

When a girder is between the rolls, the material is scraped down on the inner face of the flange, the edges of the rolls raising there a ridge and accumulating material in the corners. Now, the material in the corners must be displaced laterally—that is, across the fiber, thereby weakening the tensile strength of the material. Until the contact of the rolls at the web occurs, we may distinguish two stages: the first, when the roller comes into contact with the flanges and begins to scrape; the second, when the material is piled in the corners and displaced laterally. Before acting upon the web, which is the third stage, the flanges have been stretched out nearly completely, while the web still preserves its original length. This way of procedure, of course, must produce a great strain in the rolled material, besides considerable wear and tear of the rolls, owing to the scraping-down action. Phosphoric iron possesses the requisite qualities in a high degree, and consequently, in spite of its cold-short defects, is largely used for the manufacture of joists. This also explains why the gradual rolling of the girder sections by numerous passes through the rolls will somehow mitigate the evil, for the more rapidly the rolling is effected, the more pronounced the defects will be. With smaller H sections a considerable number of grooves can be arranged upon the rolls. In consequence of this fact, they are, as a rule, always of a better quality, but with larger sections a great number of grooves would require a considerable length of rolls, which would be very expensive, and at the same time give trouble in changing them and keeping them in working order. In Belgian and German mills, the large 20-inch and 22-inch girders of phosphoric wrought iron are roughened down, as a rule, in nine, or eight, or even seven passes.

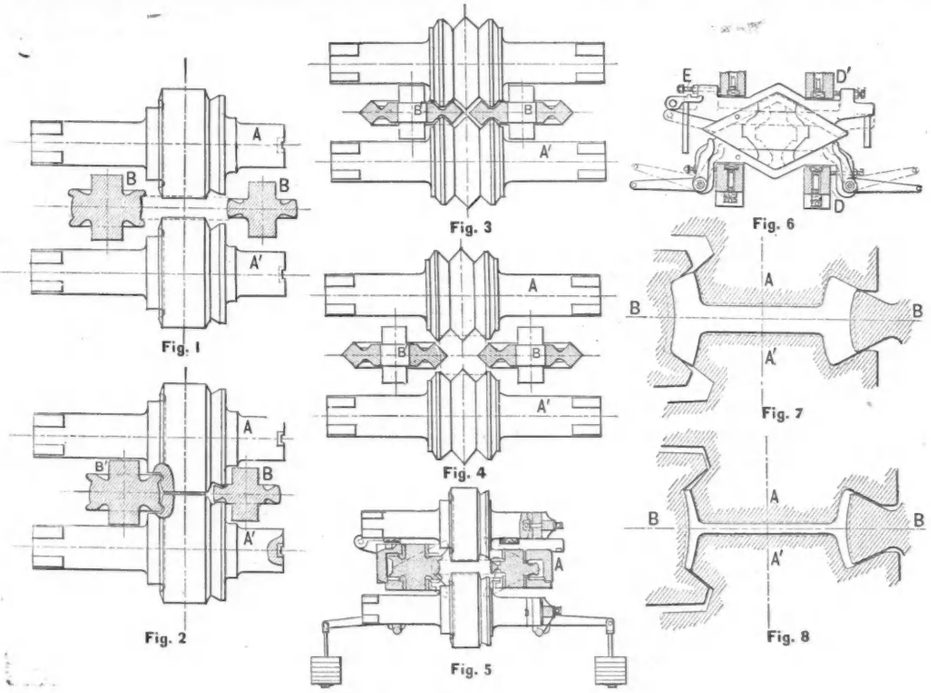
Clearly this rapid rolling process cannot have a good influence. Moreover, these practical difficulties lead to the adoption of sections suitable to the exigencies of rolling, rather than to products capable of resisting the strains which they are intended to bear. A glance at any section-sheet will show that the heighth of the flanges does not increase in proportion to the width of the web. Apart from the bad distribution of the metal from the point of view of its power of resistance, an evil also lies in the proportionately greater quantity of material removed by the rivet-holes in a low, thick flange. Generally, also, the web of large section is much too heavy in proportion, which frequently suffices to give the preference to a riveted girder. Only small steel girders up to 12 inches can now be rolled in the ordinary trains satisfactorily.

The first attempts to remedy the inconveniences by a universal mill consisting of four rolls in one plane could not fulfill the practical requirements of producing sections without fins, and with flanges of equal breadth, and perfectly symmetrically arranged to the web. How far the objections then raised have been met by the arrangements proposed to be submitted to the present meeting of practical men must be left to their judgment. It may, however, be mentioned that the trials which a few months ago were made with a Sack universal mill at the works of the Steel Company of Scotland, at Newton, those of Messrs. David Colville & Sons, in Motherwell, and at other places, have proved this mill as regards the durability and simplicity of its arrangement to be a practical success.

The leading principle of Sack's mill is to drive the horizontal rolls only, the top roll being adjustable in the usual way by a top screw gear, by means of which the vertical rolls are moved simultaneously, according to rules, implied by the kind of section to be rolled. The vertical rolls are loose rolls, the spindles of which are of about two thirds of the diameter of the horizontal ones, and strong enough for their purpose. They are driven by the friction against the bar to be rolled, and are carried in housing boxes, which are provided with wedge-shaped projections sliding upon the corresponding surfaces of two pairs of rails. These rails are inserted into the housing frames, and rest upon the bottom and top carriages of the horizontal rolls. They can be adjusted both in a vertical and in a horizontal direction by means of screws and wedges, which are all easily accessible, even while the mill is at work.

The exact adjustment of these rails is a matter of importance, because it affects the correct correlative position of the vertical rolls against the horizontal ones. Having got into this position the rolls always remain at a certain proportional distance from each other, suitable for the rolling process, a distance which is influenced by the angle of inclination of the wedged-shaped projections of the bearing-boxes of the vertical rolls. Now, by screwing down the top horizontal rolls, the two top setting rails are also lowered, and force the vertical rolls, by means of the wedges of their housing-blocks, toward each other; and as the top horizontal roll descends the vertical rolls descend with it, but only through half the distance, so that they always remain central. This will more clearly be seen from Fig. 6, which shows the position of the rails *C* at the beginning and end of rolling, the former position by full, and the latter by dotted lines. On raising the screws, the vertical rolls with their carriages are pulled apart by the action of balance weights, which, however, in large mills are better replaced by steam or hydraulic cylinders.

The housings of the mill are in no way different from those now usually



UNIVERSAL ROLLS.

* Abstract of paper by Hugo Sack, read at Iron and Steel Institute of Great Britain.

employed, so that they may serve for all other purposes of the plant. Heavy guards are provided to prevent the formation of collars, in case the material should split at the ends during the process of rolling. Sack's mill differs from former designs in one very important point, viz., in so far as the working surfaces of the rolls cover the section on all sides—Figs. 7 and 8—thus avoiding an irregular and unsymmetrical accumulation of material and the formation of fins. It may further be of interest to point out that other sections can also be rolled—angle and cruciform sections—with I sections of great length and width, and thin ribs without tapering. The rolling in a universal mill similar to the H mill will offer advantages, while the rolling of cruciform sections of larger dimensions and parallel ribs, with sharp outer edges of nice appearance, could not be done at all before. Obviously, the value of this section is based upon these qualities, and lies in sizes of 6 inches to 18 inches. The use of this form has hitherto been arrested by the difficulties of production. By ordinary rolling trains it can only be manufactured in small dimensions and with tapering ribs, useless for any structural work, while cruciform sections of correct form can compete in every respect with all other pillar sections. I refer in this regard to the remarks at the end of the paper, and now proceed with describing the rolling mill system, which is shown in Figs. 3 and 4 for the cruciform section in the second and last position, and in Figs. 1 and 2 for the H section for the first and last pass through the universal mill. The rolls for the I sections are similar to the H ones, with the exception that the bottom roll carries a collar, corresponding with a groove of the top roll, thus dividing the H section into the two parts. It has already been mentioned that the mill is chiefly intended for steel and reversing or cogging plants. The blooms are roughed down, either in a square shape for X sections, or in a rectangular one for H sections. This can be done in every cogging mill, and thus no special previous rolls are required, which is an obvious advantage. Suppose the universal mill be annexed directly to the cogging rolls, the latter can always remain at work for general purposes, even when the universal rolls are to be changed or have to be idle for want of orders, etc.

It will be noticed that the rolls of the H mill are arranged unsymmetrically. One of the vertical rolls (marked B') has got projecting flanges, which at the end of the rolling reach over undercut faces of the horizontal rolls. The circumference of the other vertical roll is met by conical faces, which, in the tighter positions of the rolls are overlapped by corresponding conical faces of the horizontal rolls. In this manner the formation of permanent fins is avoided. Thus the fins which are produced on the outer edges of the right-hand flange of the girder in one pass—Fig. 7—are, in the next pass, effaced by being pressed into the corners of the left-hand vertical roll; while the fins produced at the junction on the left side are effaced by being pressed into the corners of the horizontal rolls in the next pass. The outer circumference of the vertical H rolls is not a cylindrical surface, but has a considerable camber, thus producing curved flanges in the girder. The reason for adopting this shape is that the wear on the side walls of the working faces of the horizontal rolls is thereby greatly diminished, owing to the shorter time the rolls remain in contact with the face of the flanges; whereas with vertical faces scraping takes place. In my arrangement of inclined flanges a kind of rolling motion is substituted. It is even preferable to adopt a much greater inclination of the flanges than is shown in the illustrations, which will have the advantage of still less wear and tear of the rolls, while the rolling can begin with thinner blooms. Then only about five passes through the universal mill will be required, and the flanges are very rapidly formed, a kind of splitting of the material taking place. In the A mill, a firm grip of the inserted bar is always secured, because the driven horizontal rolls come first in contact with the bar, owing to their greater diameter, and the bite is all the better, because, at the ends of the bars, the web is, as a rule, somewhat longer than the flanges. Thus the vertical rolls begin to act after the grip has taken place. When the bar has passed through the universal mill for the last time, the flange must be squared up on a special finishing mill with four rolls.

In the rolling-mill for cruciform or star-shaped sections, the rolls are arranged symmetrically. The horizontal rolls overlap, with their conical surfaces corresponding to the surfaces of the recessed circumference of the vertical rolls. In order to make this overlapping possible without jamming, the diameter of the vertical rolls should not be smaller than that of the horizontal ones. The angle of the chamfer of the outer overlapping cones of the horizontal, and the corresponding undercurrent surfaces of the vertical, rolls is slightly less than 45 degrees, and consequently the edges of the cruciform section are not quite square with the surface of the flanges. The reduction of area takes place in the vertical dimensions only, and it is produced entirely by the horizontal rolls, thus relieving the vertical rolls from pressure. As a further consequence, the formation of a fin at the corners, that is, at the junction between the vertical and horizontal rolls—is almost entirely avoided, because the material has a rounded edge, and receives no pressure there. Owing to the angle of chamfer being less than 45 degrees, the vertical dimensions of each pass are smaller than its horizontal ones; and when the bar is turned through a quarter turn ready for the next pass, its horizontal dimensions become the smaller ones, so that the bar, when being pushed in, can be firmly gripped by the horizontal rolls. Roughly speaking, the mill is set after each pass, so that the vertical rolls approach to within the same distance which existed between the horizontal rolls in the previous pass. It is a peculiarity of Sack's rolling-mill that the rolls need not be in close contact. Nevertheless the vertical rolls are very firmly kept in their correct place by means of the action of the wedges of the vertical bearing-boxes against the very strong setting rails. After the last pass the bar is left with a slightly displaced section, which would not matter much. However, to smooth the section, a special finishing mill is provided, in which complete symmetry is attained.

The finishing mill is in its general arrangement similar to the universal mill, and serves for working upon the outer edges of the section, for smoothing is not found necessary for all cruciform sections which may be required. The housings, both for finishing and universal mills of H and X sections, are equally so that one plant is suitable for both and general purposes. The distance between the housings of the horizontal rolls is a constant one for all sizes of the cruciform sections, and with H sections for all girders from 8 inches to 18 inches. For larger girders one of the housings must be shifted and new rails fitted. The bloom roughed down in the cogging mill is brought to the universal mill. A system of feed rollers is provided with a special tilting gear driven by hydraulic power, so that the amount of hand labor is reduced to a minimum. This tilting gear is capable of performing half a turn for H, as well as a quarter turn for X sections, and can also handle bars of very great length. A further peculiarity of this gear is that the bars are straightened at the same time they are tilted. The cruciform section in this shape, and such sizes as 8 inches up to 16 inches, and even more so, is a novelty, specially intended for columns and architec ural purposes.

SOAPING GEYSERS.*

At the Buffalo meeting, October, 1888, Dr. Raymond presented a paper entitled "Soaping Geysers," in which he called attention to the use of soap by tourists to cause eruptions of several of the well-known geysers in the Yellowstone Park. Incorporated in this paper appears a communication received from me written from camp in the Park, in reply to some inquiries on the subject. The letter discussed somewhat briefly the means employed by visitors to the Park to hasten the eruptions from hot springs and reservoirs of hot water, which remain dormant for days, or even weeks or months, at a temperature near the boiling point, without any display of geyser action. As the paper has called forth considerable comment, I desire to elucidate one or two points in relation to the temperature of the springs, and to answer some inquiries about the composition of the thermal waters.

In the summer of 1885, a Chinaman, employed as a laundryman for the accommodation of the tourists at the Upper Geyser Basin, accidentally discovered, much to his amazement, that soap thrown into the spring from which he was accustomed to draw his supply of water produced an eruption in every way similar to the actual workings of a geyser. Tourists with limited time at their command, who had traveled thousands of miles to look upon the wonders of the Yellowstone, soon fell into the way of coaxing the laundryman's spring into action, to partly compensate them for their sore disappointment in witnessing only the periodical eruptions of Old Faithful. Successful attempts upon this spring soon led to various endeavors to accelerate action in the dormant and more famous geysers. In a short time, so popular became the desire to stimulate geysers in this way, that the Park authorities were compelled to enforce rigidly the rule against throwing objects of any kind into the springs.

In connection with a thorough investigation of the thermal waters of the Yellowstone Park and the phenomena of the geysers, I undertook a number of experiments to ascertain the action of soap upon the waters and to determine, if possible, those physical conditions of various pools and reservoirs which permitted the hastening of an eruption by the employment of any artificial methods. This investigation, conducted from time to time, as opportunity offered, throughout the field-season of 1885, included experiments upon the geysers and hot springs of the Upper, Lower and Norris geyser basins. The results proved, beyond all question, that geyser-action could be forced in a number of ways, but most conveniently by the application of soap. The greater part of the more powerful geysers undergo no perceptible change with a moderate use of soap, although several of them may, under favorable physical conditions, be thrown at times into violent agitation. In most of the experiments, Lewis' concentrated lye, put up in one-half pound cans for laundry purposes, was employed. Each package furnished a strong alkali, equivalent to several bars of soap. In this form alkali is more easily handled than in bars of soap, more especially where it is required to produce a viscous fluid in the larger reservoirs; and, in conducting a series of experiments for comparative purposes, it seemed best, in most instances, to employ the same agent to bring about the desired results.

Old Faithful, the model geyser of the park, exhibits such marked regularity in its workings that attempts to hasten its action appear futile. The interval between eruptions is about 65 minutes, and rarely exceed the extreme limits of 57 and 72 minutes. After an eruption of Old Faithful, the reservoir fills up gradually; the water steadily increases in temperature; and conditions favorable to another eruption are produced under circumstances precisely similar to those which have brought about the displays for the past eighteen years, or as far back as we have authentic records. The few experiments which have been made upon Old Faithful are insufficient to afford any results bearing on the question; but it seems probable that soon after the water attains the necessary temperature an eruption takes place.

Of all the powerful geysers in the Park, the Bee-Hive offers the most favorable conditions for producing an eruption by artificial means, all the more striking because the natural displays are so fitful that they cannot be predicted with any degree of certainty. Observations, extending over a period of several years, have failed to determine any established law of periodicity for the Bee-Hive, even for three or four consecutive months; although they indicate that some relationship may exist between its display and those of the famous Giantess. Frequently the Bee Hive will play several times a day and then become dormant, showing no signs of activity for weeks and months, although the water may stand above the boiling-point the greater part of the time. The name Bee-Hive was suggested by the symmetry of the cone built around the vent. It rises about 4 feet above the sloping mound of geyserite, and, in cross-section, measures about 3 feet at the top, while at the bottom of the cone the vent is less than 10 inches in width. From the top of this narrow vent it is only possible to sink a weight 17 feet before striking a projecting ledge, which interferes with all examination of the ground below. The constant boiling and bubbling of the water, the irregularity of its action, and the convenient location of the geyser, within an easy walk from the hotel, make attempts to accelerate the eruptions of the Bee-Hive most attractive to tourists.

In most instances such efforts are futile; yet success does so frequently reward the astonished traveler that, unless the geyser were

* A paper read before the Institute of Mining Engineers, February, 1889, by Arnold Hague, Washington, D. C.

carefully watched by the authorities, attempts would be made daily throughout the season. If the conditions are favorable to an eruption, it usually takes place in from 10 to 25 minutes after the addition of laundry soap or lye. It is doubtful if more than two eruptions of the Bee-Hive have ever been produced on the same day by artificial means, although I know of no reason, based upon the structure of the geyser, why more displays might not be obtained; for the reservoir and vent fill up with boiling water very rapidly after each eruption.

Although the Giantess is situated only 400 feet from the Bee-Hive, these two differ in surface and underground structure and mode of action as widely as any two of the more prominent geysers of the Park. Around the Giantess no cone or mound has formed. The broad basin is only partially rimmed in by a narrow fringe of siliceous sinter, rising above and extending out over the deep blue water. At the surface this basin measures about 15 to 20 feet in width by 20 to 30 feet in length. It has a funnel-shaped cauldron 30 feet in depth, ending in a vertical vent or neck 12 feet deep, through which a sounding-lead may be dropped into a second reservoir, meeting a projecting ledge or obstruction of some kind 61 feet below the surface. After an outburst of the Giantess the basin, which has been completely emptied of its water, gradually fills again to the top; and, for days before another eruption, a steady stream of hot water overflows the brim. The intervals between the eruptions of the Giantess vary from 12 to 20 days, and the displays last several hours, being unsurpassed for violence and grandeur by any geyser in the Upper Basin. Artificial means have never been successful in bringing this geyser into action, although, for days before an eruption, it is an easy matter to cause an agitation of the water by throwing into the basin small pieces of sinter, or to produce a boiling on the surface, lasting several minutes, by simply stirring the water with a stick.

The Giant, one of the most violent of the geysers in the Upper Basin, more closely resembles the Bee-Hive than any other of those along the Firehole River. It has built up a cone 10 feet in height, one side of which has been partly broken down by some eruption more violent than any witnessed at the present day. Through this notched side, steam and broken jets of water are constantly emitted; and on this account but little examination has been made of the underground reservoirs and vents. The Giant is fitful in its action, at times playing with considerable regularity every 14 days, and at other times lying dormant for nearly a year. I have no positive knowledge that an eruption of the Giant has ever been produced by any other than natural causes. At the time of my experiments no erruption of the Giant had taken place for several months, although the water was constantly agitated, so much so that it was quite impossible to examine the vent with any satisfactory results. The only effect produced by the application of lye was additional height to the column of water thrown out and a decided increase in the thumping and violence of the boiling.

In the lower basin the Fountain has been more carefully studied than the other geysers; and its action and periodicity of eruptions having been fairly well ascertained, it afforded the most favorable conditions for observing the action of soap and lye upon the waters. In its general structure the Fountain belongs to the type of the Giantess, having a funnel-shaped cauldron which, long before an eruption, overflows into an adjoining basin. At the time of my experiments upon the Fountain, the intervals between eruptions lasted about four hours. This interval allowed sufficient time to note any changes which might take place. My own experiments with lye yielded no positive results; although it seemed highly probable that action might be hastened by the application of soap or lye just before the time for an eruption, or when, for some cause, the eruption was overdue. I preferred to make the attempt to bring about an explosion before the usual time, only waiting until the water in the pool had nearly reached the boiling point. All experiments failed. The previous year, when wishing to produce action for the purpose of photography, I was enabled to accomplish the desired result by vigorously stirring with a slender pole, the water near the top of the vent connecting with the lower reservoir. In this instance, it should be said, the usual interval of time between eruptions had long since passed; the geyser was, so far as time was concerned, a half-hour overdue. My opinion now is that the experiments with lye failed because the temperature had scarcely reached the boiling point.

The Monarch, in the Norris Basin, is quite unlike those already described, and affords evidence of being a much newer geyser. It is formed by two convergent fissures, on the line of a narrow seam in the rhyolite, probably coming together below the surface. The main vent measures about 20 feet in length and, at the surface, 3 feet in width. But slight incrustation is found around the vent, the conditions not being very favorable to deposition. In this narrow fissure the water, which ordinarily stands about 15 feet below the surface, constantly surges and boils, except immediately after an eruption. The intervals between eruptions vary somewhat from year to year; but at the time of these experiments the action was fairly regular, the geyser playing every four hours. I was successful in obtaining an eruption quite equal to the natural displays, which throw a column of water 50 feet into the air. Here at the Monarch there is no surface reservoir, and the narrow fissure, filled with loose blocks of rocks around which the water is in constant agitation, prevents all measurements of depth.

The results of the many experiments, not only upon active geysers, but upon a large number of hot springs, determine fairly well the essential conditions which render it possible to bring about geyser-action by artificial means. Negative results are frequently as valuable for this inquiry as experiments yielding imposing displays.

Outside of a few exceptional instances which could not be repeated, and in which action was probably only anticipated by a few minutes in time, geyser eruptions produced by soap or alkali appear to demand two essential requirements: First, the surface-cauldron or reservoir should hold but a small amount of water, exposing only a limited area to the atmosphere; second, the water should stand at or above the boiling-point of water for the altitude of the geyser basin above sea-level. The principal factor which makes it possible to cause an eruption artificially is, I think, the superheated and unstable condition of the surface-waters. Many of the geysers and hot springs present the singular phenomena of pools of water heated above the theoretical boiling point, and, unless disturbed, frequently remain so for many days without exhibiting any signs of ebullition. It may not be easy to describe accurately these superheated waters, but any one who has studied the hot springs and pools in the park and carefully noted the temperatures quickly learns to recognize the peculiar appearance of these basins when heated above the boiling-point. They look as if they were "ready to boil," except that the surface remains placid, only interrupted by numerous steam bubbles, rising through the water from below and bursting quietly upon reaching the surface.

Marcet, the French physicist, has specially investigated the phenomena of superheated waters, and has succeeded in attaining a temperature of 105 degrees C. before ebullition. Superheated waters in nature, however, appear to have been scarcely recognized, except during the progress of the work in the Yellowstone Park, in connection with the study of the geysers. The altitudes of the geyser basins above sea-level have been ascertained by long series of barometric readings, continued through several seasons. In conducting a series of observations upon the boiling-points of the thermal waters in the Park, Dr. William Hallock, who had charge of this special investigation, determined the theoretical boiling-point by noting the mean daily readings of the mercurial column. The exact boiling point of a pure surface-water, obtained for a neighboring mountain stream and the boiling-point of the thermal waters from the springs, were determined from actual experiments by heating over a fire, employing every possible precaution to avoid sources of error. Surface-waters and deep-seated mineral waters gave the same results, and coincided with the calculated boiling-point at this altitude. Hundreds of observtions have been carefully taken where the waters in the active and running springs boiled at temperatures between 198° and 199° Fahr.

As will be shown later in this paper, the thermal waters are solutions of mineral matter too dilute to be affected to any appreciable extent as regards their boiling-point by their dissolved contents. The theoretical boiling-point for the springs and pools in the Upper Geyser Basin may be taken at 92·5 degrees C. (198·5 Fahr.). In many of the large cauldrons, where the water remains quiet, a temperature has been recorded of 94 degrees C. (201.2 degrees Fahr.) without the usual phenomena of boiling. This gives a body of superheated water, with a temperature at the surface 1·5 degrees C. (2·7 degrees Fahr.) above the point necessary to produce explosive action. Thermometers plunged into the basins show slightly varying temperatures, dependent upon their position in the basin. They indicate the existence of numerous currents, and a very unstable equilibrium of the heated waters, which are liable, under slight changes, to burst forth with more or less violence. It is under these conditions that geyser action can be accelerated by artificial means. If into one of these superheated basins a handful of sinter pebbles be thrown, or the surface of the water be agitated by the rapid motion of a stick or cane, or even by lashing with a rope, a liberation of steam ensues. This is liable to be followed by a long boiling of the water in the pool, which in turn may lead to geyser-action. There is some reason to believe that, at least in one instance, an eruption has been brought about by a violent but temporary gust of wind, which either ruffled the water or disturbed the equilibrium of the pool, and changed momentarily the atmospheric pressure.

In Iceland travelers have long been accustomed to throw into the geysers turf and soft earth from the bogs and meadows which abound in the neighborhood, the effect produced being much the same as that of sineter pebbles and gravel upon the geysers in the National Park. So well was this understood that at one time a peasant living near the Iceland locality kept a shovel solely for the accommodation of those visiting the geysers.

In my letter to Dr. Raymond I mention the curious fact that the laundryman's spring, now known as the Chinaman, in which geyser-action may most easily be produced by artificial means, has never been regarded by the Geological Survey as anything but a hot spring, and no one has ever seen it in action without the application of soap, except in one instance, when it was made to play to a height of 20 feet after stirring it vigorously with a pine pole for nearly ten minutes. In our records it is simply known as a spring.

If soap or lye is thrown into most of the small pools, a viscous fluid is formed; and viscosity is, I think, the principal cause in hastening geyser-action. Viscosity must tend to the retention of steam within the basin, and, as in the case of the superheated waters, where the temperature stands at or above the boiling-point, explosive liberation must follow. All alkaline solutions, whether in the laboratory or in nature, exhibit, by reason of this viscosity, a tendency to bump and boil irregularly. Viscosity in these hot springs must also tend to the formation of bubbles and foam when the steam rises to the surface, and this in turn aids to bring about the explosion.

Dr. Raymond has made the suggestion that the addition of caustic alkali would possibly precipitate some of the mineral ingredients found in these waters, thereby changing their chemical composition sufficiently to affect the point of ebullition. At the same time he remarks that the geyser waters are probably too dilute solutions to be much influenced by such additions. The analyses of the waters of the Bee-Hive, Fountain, and Fearless must show, I think, that they are not only too dilute to undergo any marked change of temperature; but that the mineral constituents consist mainly of the carbonates and chlorides of the alkalies, associated with a relatively large amount of free silica which would remain unacted upon by caustic alkali. There is nothing in the waters to be thrown down by the addition of alkali or permit any chemical combinations to be formed by the addition of a small amount of soap. The desire of tourists to "soap a geyser" during their trip through the park grows annually with the increase of travel, so much so that there is a steady demand for the toilet soap of the hotels. If visitors could have their way, the beautiful blue springs and basins of the geysers would be "in the suds" constantly throughout the season. Throwing anything into the hot springs is now prohibited by the government authorities. It is certainly detrimental to the preservation of the geysers, and the practice cannot be too strongly condemned by all interested in the National Reservation.

Gnomium—A New Element.—Dr. G. Krüss and F. W. Schmidt have called the new metal discovered by them in commercial nickel and cobalt, gnomium.

Coal Production of Germany.—The production of coal in Germany last year attained an aggregate of 65,321,834 tons, as compared with 60,333,987 tons in 1887, showing the large increase of 4,987,847 tons last year. The production of lignites also advanced in Germany to 16.541,970 tons last year, as compared with 15,883,634 tons in 1887, showing an increase of 658,336 tons.

Reduction of Tin Ores.—The problem of separating the mica in the tin ores by a simple and effective process is claimed to have been solved by Professor Carpenter, of Dakota. If this should be true, and the deposits in the Black Hills prove anything like as extensive as they have been represented, it ought to aid the establishment of a vast tin plate industry to compete with the foreign producers.

Historical Brick Kilns.—The first brick kiln erected in this country of which we have any account, was built in Virginia in 1612, and in 1629 another kiln was erected in Salem, Mass. The minister at Salem thus wrote to a friend: "It is thought here is good clay to make bricke, and tyles and earthen pots, as need to be. At this instant we are setting a brick kill on worke to make brickes and tyles for the building of our houses."

Mexico and Japan.—The Japanese and Mexican Ministers at Washington, D. C., on the 6th inst. exchanged ratifications of the new treaty between their respective countries. It differs from the conventions made by other powers with Japan in the facts that no provision is included for the exercise of extra-territorial jurisdiction, and no right of interference with the Japanese tariff is accorded. Mexican citizens in Japan are declared subject to Japanese laws, and Mexican traders are held amenable to the commercial regulations of the Eastern Empire. In return for these concessions, Mexicans may engage in business in all parts of Japan, and may participate in all domestic enterprises, none of which have hitherto been accessible to western capital. Japan receives the first recognition of her independent sovereignty, and Mexico acquires valuable and exclusive privileges hitherto denied to all strangers. A treaty similar in some particulars to the Mexican has been drafted by representatives of the governments of the United States and Japan, and is now under consideration in the State Department. Its terms indicate the most liberal spirit on Japan's part, and its demands can only be regarded as singularly modest, in view of the conditions set forth in the agreement which now prescribes the relations of Japan and Mexico.

The Smallest Screws in the World.—The smallest screws in the world are made in an American watch factory. They are cut from steel wire by machine, but as the chips fall down from the knife it looks as if the operative was simply cutting up the wire for fun. The fourth jewel-wheel screw is the next thing to being invisible to the naked eye. With a glass, however, it is seen to be a small screw, with 260 threads to the inch, and with a very fine glass the threads may be seen very clearly. These little screws are $\frac{4}{1000}$ of an inch in diameter, and the heads are double the size. About 1,000,000 of them are made a month, but no attempt is ever made to count them. In determining the number, 100 of them are placed on a very delicate balance, and the number of the whole amount is determined by the weight of these. All of the small parts of the watch are counted in this way, probably 50 out of the 120. After being cut, the screws are hardened and put in frames, about 100 to the frame, heads up. This is done very rapidly, but entirely by sense of touch instead of sight, so that a blind man could do it just as well as the owner of the sharpest eyes. The heads are then polished in an automatic machine, 10,000 at a time. The plate on which they are polished is covered with oil and a grinding compound, and on this the machine moves them rapidly by reversing motion until they are fully polished.

Austrian Petroleum Wells.—The success of the petroleum borings in Galicia are indicative soon that the Austro-Hungarian empire will be totally independent of a foreign supply of oil. Formerly there was a tendency to speak slightingly of Galician oil deposits owing to the fact that a large proportion of the wells were dug by hand. Of late years the American method of drilling has been introduced, and many Galicians have become accomplished drillers. In the Lodyna district wells of a profitable character have been bored. Galician wells have not the copiousness of Russian, but a readier market exists for the oil, and the demand for Lodna petroleum is such that it is sold at a high rate long in advance of appearing on the surface. The oil belt of Lodyna is five miles long and intersected by a railway, thereby enabling the oil to be sent to the refineries at a trifling expense. A few years ago all the refineries in Galicia did not produce 1,000,000 gallons of refined oil, but now their production exceeds 6,000,000 gallons. The Austrian government takes great interest in the development of the petroleum industry, and has adopted a protective policy which has already succeeded in establishing the Galician oil trade on a firm basis. In consequence of this and of such successes as the recent borings at Lodyna, where wells have been struck giving a profit of 500 or 600 per cent, the financial and commercial world in Austria has been deeply moved, and petroleum has caused much excitement.

Cave-Dwellers Found In Mexico.—A dispatch from Deming, New Mex., says: "Lieutenant Schwatka has arrived there. His party has been successful beyond expectations in their explorations, and especially in Southern Chihuahua, where living cliff and cave dwellers were found in great abundance, wild as any of the Mexican tribes at the time of Cortez's conquest. The abodes they live in are exactly similar to the old, abandoned cliff dwellings of Arizona and New Mexico, about which there has been much speculation. It was almost impossible to get near them, so wild and timid were they. Upon the approach of white people, they fly to their caves by notched sticks placed against the face of the cliffs, if too steep, although they can ascend vertical stone faces, if there are the slightest crevices for their fingers and toes.

"These cliff-dwellers are sun-worshipers, putting their new-born children out in the full rays of the sun the first day of their lives, and showing many other forms of devotion to the great luminary. They are usually tall, lean and well-formed, their skin being a blackish red, much nearer the color of the negro than the copper-colored Indian of the United States.

"Schwatka claims that nothing has heretofore been known about these people, except by the half-Indian mountain Mexicans, and thinks his investigation will be of immense anthropological and archæological value. He estimates the cave and cliff-dwellers to be from 3,000 to 12,000 in number, armed only with bows, arrows and stone hatchets."

New South Wales Railway Returns.—The first quarterly report of the New South Wales Government Railways, under the management of the new Commissioners, has just been published in accordance with the 44th clause of the Railway Act of 1888. The comparative statement of the traffic has been given as follows:

	Quarter ending Dec. 31, 1887.	Quarter ending Dec. 31, 1888.
Revenue from all sources	£671,253	£757,881
Expenditure	422,994	419,150
Number of passengers	3,789,015	4,170,043
Tons of goods	830,511	688,150
Tons of live stock	17,603	29,805
Train mile runs	1,724,439	2,097,116
Earnings per train mile	7s. 9½d.	7s. 2¾d.
Expenditure per train mile	4s. 10¾d.	4s. 0d.
TRAMWAYS.		
	1887.	1888.
Revenue from all sources	£57,986	£62,408
Expenditure	58,869	58,326
Number fares	13,130,373	14,346,102
Train miles run	340,110	377,386
Earnings per train mile	3s. 5d.	3s. 3¾d.
Expenses per train mile	3s. 5½d.	3s. 1d.

The falling off in tonnage of goods carried (over 140,000 tons) is due to the suspension of work in the Newcastle district, owing to a strike of miners. The commissioners entered upon their duties on the 22d October, 1888. When taking office they found the locomotives needing much attention, no less than 74 out of 429 engines being under repair. As there are 42 types of locomotives, and numerous types of carriages and wagon, they have authorized plans to be prepared for standard types of engines, carriages and wagons, and that they expect by adopting interchangeable parts to materially improve the rolling stock without increasing the expenditure.

BOOKS RECEIVED.

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

The Mineral Wealth of British Columbia. Part R., Annual Report, 1887. By George M. Dawson, Ottawa. Published by the Geological and Natural History Survey of Canada. 1888. Pages 163. Price 25 cents.

Geological Survey of New Jersey. Annual Report of the State Geologist for 1888. By George H. Cook, State Geologist, New Brunswick, N. J., published by the State, 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.

PATENTS GRANTED JUNE 4TH, 1889.

404,378. Boiler Furnace. Edward Barrett, Fall River, Mass.
404,381. Ingot Mold. Edward L. Clark, Pittsburg, Pa.
404,382. Art of Casting Steel Ingots. Edward L. Clark, Pittsburg, Pa.
404,394. Mechanism for Cushioning Traversing Beds of Reciprocating Machinery. Henry P. Feister, Philadelphia, Pa.
404,397. Device for Ejecting Oil from Oil-Wells. William Geiser, Salina, Pa.
404,399. Apparatus for Burning Petroleum or Similar Substances. Louis P. Guignard, Fluntern, near Zurich, and Jakob Schweizer, Unterstrass, near Zurich, Switzerland.
404,401. Railway Track. Jacob Haish, De Kalb, Ill.
404,414. Method of Mixing Molten Pig Metal. William R. Jones, Braddock, Pa.
404,415. Apparatus for Mixing Molten Pig Metal. William R. Jones, Braddock, Pa.
404,428. Oil Burner. George S. Paine, Wyandotte, Mich.
404,446. Alternating Current Electric Motor. Charles S. Bradley, Yonkers, N. Y.
404,447. Car Dumping Apparatus. Albert F. Thayer, Maple Hill, Kan.
404,469. Electric Railway. William Cannell, Cleveland, O.
404,473. Process of Reducing Iron Direct from its Ores. Charles J. Eames, New York, N. Y.
404,484. Dynamo-Electric Machine. William Hochhausen, Brooklyn, N. Y.
404,487. Railway Rail Joint. Eugene P. Jervey, Charleston, S. C.
404,488. Water Current Motor. Frank G. Johnson, New York, N. Y.
404,509. Valve Gear for Compound Engines. John C. H. Stut, San Francisco, Cal.
404,510. Tool-Car for Mines. Joseph Treweek, Lead City, Dak.
404,520. Apparatus for Manufacturing Gas. Walton Clark, Philadelphia, Pa., Assignor to the United Gas Improvement Company, same place.
404,521. Slime Separator. Patrick H. Dunagan, Denver, Colo.
404,527. Compound Hydrocarbon Gas-Generator. Robert Ferguson, St Paul, Minn.
404,528. Hydraulic Engine. Charles E. Foster, Washington, D. C.
404,530. Nut Lock. George P. Fuller, Minneapolis, Minn.
404,533. Electric Motor and Regulator. Alfred Gartner, Newark, N. J., Assignor by mesne assignments to the Continental Motor and Electrical Company, same place.
404,550. Railroad Rail-Fastener. Charles Netter, New York, N. Y.
404,566. Method of Distribution by Alternating Electric Currents. Oliver B. Shallenberger, Rochester, Assignor to the Westinghouse Electric Co., Pittsburg, Pa.
404,600. Determining the Temper of Iron or Steel. Carl A. Caspersson, Forsbacka, Marzretchill, Sweden.
404,642. Water Wheel. Lee Middleton, Clarksville, Mo.
404,660. Elevator and Conveyer. Charles J. Seymour, Brookline, Mass.
404,687. Electric Railroad. Leo Daft, Plainfield, N. J.
404,706. Self-feeding Furnace Grate. Lewis Hopcraft, Stamford Hill, County of Middlesex, England.
404,733. Method of Producing Steel Direct from Ore. William F. M. McCarty, Hagerstown, Md., Assignor, by direct and mesne assignments, of part to Jane Logan, same place, Catharine Elshon, Philadelphia, Pa., and Heman D. Walbridge.
404,741. Apparatus for Raising Quicksand. Henry Stoltze, Sr., Manitowoc, Wis.
404,764. Rail Joint. Dwight R. Atkinson, Albany, Assignor of one-half to J. Edward Dodge, Waterford, N. Y.
404,786. Steam Pipe Coupling. Freeman Hanson, Hollis, Assignor to himself, George C. Kelly, Orrin Kelly, George S. Helman and W. A. Evans, all of same place.
404,807. Dust Catcher for Blast Furnaces. Francis H. Treat, Joliet, Ill., Assignor of two thirds to Horace S. Smith and Charles Pettigrew, both of same place.

PERSONALS.

Mr. Augustus J. Bowie, the well known mining engineer of the Pacific Coast, is now in New York.

Mr. Wm. Fries, President of the Eureka Consolidated Mining Company has left New York for San Francisco.

Mr. Thos. B. Birkbeck, of Liverpool, passed through New York this week on his way to visit mining property in the State of Sinaloa, Mexico.

The Engineers' Society, of Western Pennsylvania, will hold its next monthly meeting at the society's rooms in Pittsburg, Pa., on the 18th inst.

Mr. J. H. Sanborn has left New York to become the mill superintendent of an English company at Mesquital del Oro Mininsco, Juchipila, Zacatecas, Mexico.

Mr. Alfred Rickard, General Manager of the California Mine Company, Limited, of Colorado, has gone to London, England, in the interest of the company.

Mr. J. B. Wheeler, President of the Aspen Mining and Smelting Company, will spend the summer in Colorado. He leaves New York for the West in about a fortnight.

Messrs. Geo. M. Pinney and J. M. Harper are visiting Alaska. Mr. Harper was one of the parties who floated the Santiago Gold Mining Company of the Republic of Colombia.

Mr. H. H. Hamilton, formerly Assistant Western Sales Agent of the Lehigh Valley Coal Company, has been appointed General Sales Agent of the firm of A. T. Thatcher, of Chicago, Ill.

Mr. Hezekiah S. Parmalee, formerly of Buffalo and for several years a resident of Lockport, N. Y., a well-known coal merchant, died suddenly of heart disease June 4th, aged 67 years.

Prof. William Strieby, of Colorado College, Colorado Springs, Colorado, has arrived in New York. Prof. Strieby is a graduate of the Columbia College School of Mines in the class of 1878.

Prof. George F. Barker, of the University of Pennsylvania, who is so well known for his expert testimony on subjects pertaining to electric lighting, is spending a few days in New York City.

Commissioner Stockslager, of the General Land Office at Washington, has resigned. His resignation will take effect July 1st. Ex-Governor Stone, of Iowa, it is reported, will probably succeed him.

It is reported that Mr. Brown, of the firm of Brown & Emery, railroad contractors, who were engaged in driving a tunnel near Johnstown, is drowned, as he has not been seen by his friends since the disaster.

There is said to be a general desire among the miners and operators of the coke region that Mr. F. C. Keighley, late Superintendent of the Youngstown Coke Works, be appointed Mine Inspector of the Connellsville district, Pa.

Dr. Francis Wyatt, the well-known chemist of New York, has taken into partnership Auguste Weingaertner, Ph.D., and the business will hereafter be conducted under the firm name of Wyatt & Weingaertner.

Grave fears are felt regarding Guy D. Peck, son of Prof. William G. Peck, of Columbia College, who was a mechanical engineer at the Cambria Iron Company's works at Johnstown, Pa. Nothing has been heard of him since the catastrophe.

Mr. T. H. Reynold has resigned the position held by him for the past seven years as Superintendent of the Standard Chemical Company, and has engaged in business as broker in chemical manufacturers' supplies at No. 59 Pine street, New York City.

The Committee on Science and Arts of the Franklin Institute have recently recommended the following awards of the John Scott Legacy medal and premium: C. Kerschel Koyl, of Sharon Hill, Pa., for his "parabolic semaphore;" to Otis C. White, of Worcester, Mass., for his "adjustable movement in ball and socket joints;" to A. A. Marks and George E. Marks, of New York City, for their "improvements in artificial limbs;" to Thomas Shaw, of Philadelphia, Pa., for his "mine inspector's gas testing apparatus;" to Roman Abt, of Luzerne, Switzerland, for his "system of railways for steep inclines;" to James Atkinson, of London, England, for his "improvement in gas engines;" to Dr. Richard Leach Maddox, of Southampton, England, for the "substitution of gelatine for collodion in photography;" to Charles A. Teal, of Philadelphia, Pa., for "improvements in portable hoists;" to John B. Root, of New York City, for his "spiral weld tube."

Dr. Arnold Guyot, the scientist, so long and so honorably connected with the chair of geology and physical geography of Princeton College, Princeton, N. J., was a Swiss and his memory is being honored in his native land. Owing to a great demand the famous French firm of Hachette & Co. have now published from the original French MS. Guyot's celebrated work on "Earth and Man," which thus appears for the first time as actually written. It had long been Dr. Guyot's cherished wish to supervise such an edition, but his death prevented its execution. Mr. Charles Faure, Secretary of the Geneva Geographical Society, has prefixed to the new edition a charming and sympathetic biographical notice, while M. Vivian de Saint Martin, the Nestor of French biographers, contributes a preface, and calls the work a "restitution to the European public." It is an interesting coincidence that while Princeton College is preparing to unveil this June, to Dr. Guyot's memory, a tablet hewn from those boulders whose life history he chronicled when making his discovery of the laws of glacier-motion, Switzerland is soon to place a bust of Guyot opposite the memorial to Agassiz, his compatriot, friend, and fellow-worker, in the hall of the handsome new building of the Neuchatel University.

INDUSTRIAL NOTES.

After a successful run of nearly four years, No. 11 furnace of the Thomas Iron Company, at Saucon, Pa., will blow out the present week to make repairs.

The Jeffrey Manufacturing Company, of Columbus, Ohio, report a steady demand for its elevating and conveying machinery. The company is running its works full time.

The United Rubber Company, of Trenton, New Jersey, has introduced a patent rubber mat for deadening the noise of type-writing machines, which is certainly a meritorious invention.

A preliminary meeting of the manufacturers of steel shafts was held at Pittsburg, Pa., last week, for the purpose of forming an association for mutual protection. Only three manufacturers were present, but matters pertaining to the trade were discussed. Another meeting will be held at an early date, when a large attendance is expected.

The Bethlehem Iron Company, of Bethlehem, Pa., under its contract with the Government from its new plant, is now prepared to furnish the largest forgings which will be required for the heaviest ordnance under present designs. The company is now turning out the largest steel forgings ever attempted in the United States.

Thomson Electric Welding Company, of Boston, Mass., has commenced work on its new factory at Lynn. It has recently made a contract with the Trenton Iron Company, of Trenton, N. J., for welding cable rope. Experiments in this line, it is said, showed the electric method to give within 18 per cent of the normal strength of the cable.

The Reading Trust Company, assignee of the Reading Iron Works, of Reading, Pa., has given up all hopes of a reorganization through the creditors and stockholders, and on the 5th inst. it was decided to sell the entire plant, furnaces, rolling, pipe, tube and sheet mills, forges, foundries, etc., and numbers of tracts of land in Reading on July 1st. This, it is believed, will result in an early resumption of the works. In our last issue we published the official appraisement of the works.

The Warren Chemical and Manufacturing Company has taken possession of their new offices in the Fulton and Market National Bank Building, which has just been completed at the corner of Fulton and Gold streets. The development of the use of asphalt for roofing and paving materials is largely due to the efforts of this company. Its president, Mr. Charles M. Warren, began the investigation of the subject as a student in Boston, and the result of his knowledge and experience has to-day placed his business among the first of its kind in this country.

The annual convention of the Amalgamated Association of Iron and Steel Workers convened at Pittsburg, Pa., on the 5th inst. Two hundred delegates were present. The Eastern delegates were detained east of the breaks on the Pennsylvania Railway tracks. President Weihe's address was brief. He said the Scale Committee had taken all matters into consideration during its deliberations and were prepared to present a scale which no manufacturer can ignore on grounds of pecuniary loss on account of its adoption, neither will the workmen suffer because of the terms specified.

The various offices in the Westinghouse Building, at Pittsburg, Pa., are kept cool by electricity. Nickolo Tesla, the inventor of the alternating current motor, has completed an adaptation of his motor to a fan, or to the revolving shaft of fans, for the production of cool air. The motors range from ⅛ to ¼ horse-power and are of the simplest construction, consisting only of a shaft revolving in an iron cylinder. There is no delicate machinery connected with the motor. After it has been attached to the electric current usually operating door-bells or lamps in private residences it will run forever, requiring only an occasional oiling of the bearings. The rapid rotation of the fan connected with the revolving shaft produces a current of cool air in the room.

Messrs. G. S. Wormer & Sons, of Detroit, Mich., the old-established machinery firm, made an assignment on the 31st ult. A dozen years ago it started branches in Chicago and St. Louis. All three stores are included in the assignment. The firm handled engines, boilers, wood-working machinery, etc., but the St. Louis house made a specialty of engines and heavy mining machinery. The Detroit house has been well managed, and can meet all its liabilities, but the Chicago branch is badly off, and St. Louis is also somewhat behind. The total liabilities are placed at $130,000 with assets estimated at $45,000. The Detroit manager asserts positively that he will resume as soon as he can get freed from the present entanglements, and it is highly probable that the St. Louis branch will open again also.

The question as to what shall be done with the Chesapeake & Ohio canal appears to have been solved by Friday's storm in very summary fashion. According to the report of President Gambrill at the annual meeting of the stockholders held this week, the canal is "virtually gone as a water-way." It is estimated that from $500,000 to $1,000,000 and many months of labor would be required to restore it to navigable condition. Meanwhile the question as to what shall be done to prevent foreclosure by the holders of repair bonds presents itself with increasing urgency, the sum of $75,000 in interest being due them on the first of July. The state has invested $7,000,000 already in it, exclusive of many millions more of unpaid interest. President Gambrill inclines very strongly to the proposition that the canal shall be rendered navigable for boats of larger tonnage, in the hope of making it an efficient competitor with the railroads, and others recommend its extension to Baltimore as a means of contributing to the same result.

A need of better facilities for the handling of supplies and products in large manufacturing establishments has led to the adoption of tramway cars propelled by electric motors. A greater part of the large mills being supplied with electric lighting systems renders this an easy matter, and it is safe to predict that before long the electric tramway will come to be considered a necessary feature in mill equipment. The Thomson-Houston Electric Company, of Boston, Mass., has already equipped several tramways, and has contracted for others which will soon be put in operation. The tramway car at the company's works in Lynn, Mass., is used for carrying heavy machinery to different parts of the factory, and its use permits the handling of apparatus with much greater ease, in less time, and with less labor than could possibly be accomplished by any other method. The car is equipped with two 3 horse-power motors, and easily carries up a grade of 13 per cent a load of 5 tons, while from 8 to 10 tons can be carried on a level. The motor receives its current through an overhead wire from one of the generators in the factory.

CONTRACTING NOTES.

Our list of machinery and supplies wanted will be found on page xii. Manufacturers of machinery, engineers and contractors should also consult our directory of "Contracts Open" on the same page. This week, proposals are invited for the following new contracts: No. 1430, Furnishing Terra-Cotta Pipe; No. 1431, Furnishing Cement and Lime; No. 1432, Furnishing Ordnance Supplies; No. 1433, Construction of Water-Works; No. 1434, Cast-Iron Pipe; No. 1435, Dredging; No. 1436, Pump and Boiler; No. 1437, Cast-Iron Water Pipe; No. 1438, Aqueduct Work; No. 1439, Paving Material; 1440, Constructing Sewers; No. 1441, Stone; No. 1442, Trenching; No. 1443, Constructing Iron Bridge.

The New York, Ontario & Western Railroad Company has awarded the contract for building the "zig-zag" tunnel seven miles north of Walton, Delaware County, N. Y., to Messrs. Ward & Lavy, of Newburg, N. Y. The tunnel will be 1600 feet long, with approaches 2000 feet long on each side. The work will be begun at once and, it is said, completed in a year.

GENERAL MINING NEWS.

Nine separate suits, brought by Manuel Eyre against the directors of as many mining companies to recover $1,000 in each case for failure to post monthly statements of receipts and disbursements in the offices of the respective companies, as required by the law of March, 1880, has been brought in San Francisco. It is admitted that statements were posted by the officers of the companies in the form as advised by the attorneys of the corporations, but Eyre claims that they were not complete enough to conform with the requirements of law. A judgment of non-suit has been rendered by Judge Hunt in favor of defendants.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including May 29th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1889.	Tons 1888.
Marquette, Marquette District....	49,434	103,797
St. Ignace, " " ..	7,452	14,447
Escanaba, " "	134,992	142,247
" Menominee District....	332,546	179,112
" Gogebic District.....	41,054	.....
Ashland, " "	241,115	103,792
Two Harbors, Vermillion District.	110,324	28,188
Total tons.....	1,166,887	571,613

ALABAMA.

JEFFERSON COUNTY.

DE BARDELEBEN COAL AND IRON COMPANY.—The company has ordered the resumption of work on slope 3, which is a mile and a half west of Johns, and soon this company will have another source of an output of 600 tons daily of coal. A new town will be built here, and it will be christened "Sumpter." The completion of slope 3, with connections in each slope with the lower seam, will enable a daily output of nearly 3000 tons to be made.

ARIZONA.

PINAL COUNTY.

GREAT EASTERN CONS. MINING AND MILLING COMPANY.—We understand that efforts are being made to "place" the Great Eastern group of mines under the above title on the New York and St. Louis markets. The property is located on the Bitterwell range of

mountains, thirty-five miles southwest of Casa Grande, a station on the S. P. R. R.

PEERLESS MINING COMPANY.—A recent official weekly report states that ore of good quality is still being taken from the stopes on the 200-foot level, but at other points through the mine, owing to some of the stopes lowering in grade and others that need further prospecting to get ore in shape for breaking, after May the company will not be able to keep up a sufficient supply of ore of milling grade for running the mill until further development is made.

CALIFORNIA.

CALAVERAS COUNTY.

[From our Special Correspondent.]

A good deal of activity is being shown in mining on the south side of Calaveras County. A large English company, the Calaveras Consolidated, is doing extensive work at Robinson's Ferry, with most excellent prospects of success. Unlike most English mines this property is being developed in a business-like manner, and work done as low as anywhere in the State. At Angels Camp, the Nevills mine, lately bought by Messrs Hayward and Hobart, is now run under the same management as the Lane, operating altogether 80 stamps on an enormous vein of low grade quartz. Many other claims of great merit are being developed in the vicinity, and this camp promises to soon place the county well on the list of bullion producers.

At San Andreas that unfortunate English company, the Cordova Union, have again come to grief through new litigation with the late owner, after paying in the neighborhood of $800,000 for their mine and mill, and just as they were opening a very promising vein previously unexplored.

At Central Hill several hydraulic mines are being worked at a profit and lately quite a stir has been made among the Drift mines, several of which are being opened with fair prospects.

In the Mokelumne Hill District the Quaker City quartz mine is pushing exploratory work vigorously, and have a short pay chute opened of high-grade quartz at a depth of about 250 feet. The future of this mine is promising. The old reliable Duryea drift mine in Chili Gulch still runs and pays, as it has done for 16 years under the owner's direction, being a remarkable example of economical management. Near the Duryea the Mosher hydraulic is being worked vigorously.

On the Amador side of the Mokelumne River, within a mile of Mokelumne Hill, is the River Gold Mine, on which a fine ten stamp mill runs steadily by power taken directly from the river, on a large body of hard low grade quartz, which is said to be reduced at a total cost of $1.12 per ton, paying a steady monthly dividend.

At Rich Gulf the Ilex Mines, owned by the Ilex Gold Mining Company, Limited, of London, appear to be on the point of abandonment, it being understood that unless the exploring work being done near the 400 foot level develops something better than has been found in the past, the entire mine will be closed. This is a sad example of the folly of relying solely on assays and theories, and the erection of unnecessary and expensive plant, merely because it might be useful in the future, after a mine was found.

The Foot & Thompson mine also proves of too low grade to be profitably worked, in spite of extraordinary natural advantages.

At West Point, in the base ore belt, only the Blazing Star mine is productive. So far the character of the quartz in this district seems to be rich and base near the surface, but practically barren below 150 feet; still the mines have not been opened to any great depth, the owners having become frightened when the gold disappeared, or unable financially to sink deeper through hard, unproductive ground.

At Blue Mountain, the Black Wonder Mine, with a five stamp mill pays a small dividend, and is stated to be improving.

Foreign companies attempting to work mines in this part of California have had a bitter experience through getting poor properties at high prices, over-capitalization, extravagance and black-mailing, and the last deserves more than a passing notice. It seems to be considered that foreign corporations are fair prey for black-mailers; the sellers of mines, not being content with receiving large sums for their claims, join with their neighbors in putting every obstacle in the way of development. Farmers selling their produce to the mines and benefitting in every way oppose the construction of ditches, the use of old roads and outlets for tailings. Examples of this are found in the Calaveras Consolidated Company, which had to suspend operations temporarily through the greed of a man who had already received a large sum for land; the Union Gold Mine, which has been bled for over half a million, and is again stopped by the same enterprising neighbor; the Ilex mines, where a non-resident bought surrounding lands and attempted to force the company to either pay blood-money or stop operations; and the River Gold Mine, on a smaller scale, where neighbors attempted to prevent the acquirement of a mill-site unless they were paid a round sum to withdraw. These facts are notorious, and intending investors are confronted with the very serious necessity of guarding every avenue of approach by the blackmailer, an exceedingly difficult matter when the fact is considered that in California the miner is to all intents and purposes a vagabond in the eyes of the law. Witness Judge Sawyer's decisions in the now famous anti-débris cases, which include *all* miners, while ostensibly dealing with hydraulic miners.

NEVADA COUNTY.

IDAHO MINING COMPANY.—A fire broke out in the ten hundredth level of the Idaho mine on the 3d inst., and the mine was shut down on the 4th to smother the flames. Several miners lost their lives by suffocation, and while trying to rescue the entombed miners.

COLORADO.

The Colorado Mining Stock Exchange was organized on the 27th ult., at a meeting held at the Chamber of Commerce, Denver. The directors elected were: C. E. Taylor, M. E. Smith, H. E. Wood, O. P. Whitcomb, J. L. McNeil, W. C. Wynkoop, I. E. Blake, George F. Batchelder, A. H. Weber, C. W. Badgley, E. F. Hallack, P. L. Bockfinger and H. Van F. Furman, and the capital stock is $50,000. The articles of incorporation were so changed that it will be possible for the exchange to deal not only in mining but other stocks as well.

ROCKY MOUNTAIN SMELTING COMPANY.—This company, organized under the laws of Indiana, has filed its incorporation papers with the Secretary of State. It is the old organization which owns the Duryee patent furnace.

ARAPAHOE COUNTY.

BOSTON AND COLORADO SMELTING COMPANY.—At a meeting of this company, held in Boston on the 4th inst., it was voted to increase the capital stock 25 per cent, or to $1,250,000, shareholders to be privileged to subscribe at par (100) for one new share for every four now held, on or before July 10th. There is no market value for the stock. A holder has stated that he would not sell for less than $200, but might part with his stock at that price. On the other hand, it is said that a sale was made not long ago, say a few months, at $140@$150, dividend and rights on, and $15 is now bid for the rights, with none offering so far as learned. Very likely no rights will be sold, unless as a favor to some stockholder who wishes to round out his holdings.

BOULDER COUNTY.

The Osceola-White Crow mining suit has been settled by a compromise. The property will be worked by a company, in which the contestants will have a share. It will be managed by Hon. Henry Neikirk. This lawsuit has been pending for several years. It has been tried several times in the District Court in this county and twice in the United States Circuit Court in Denver. The mines are situated in Sunshine, about six miles west of Boulder. A large amount of very rich ore has been taken out of the ground in dispute.

WHITE CROWN GOLD MINING COMPANY.—This company, of Boulder, has filed articles of incorporation. The capital stock is placed at $250,000.

EAGLE COUNTY.

IRON MASK.—A cave was struck in the lime in the breast of the Iron Mask workings last week which had the appearance of an underground lake. The water rose 30 feet in the incline in a short time, not allowing time to get the tools out. The pump was started at a lively gait and the water lowered by morning enough to allow exploring the cave ahead some 10 or 15 feet. The mine is looking well in all parts.

GILPIN COUNTY.

GREGORY-BOBTAIL MINING COMPANY.—The property of this company was sold at public auction in New York on the 4th inst. It was bought in for the sum of $100,000 by a representative of the bondholders. We understand that a reorganization of the old company is contemplated.

NEW CALIFORNIA MINING COMPANY, LIMITED.—An air compressor and power drills are about to be ordered to be placed on the deep or main shaft on the California, on Quartz Hill. The depth of the mine has now reached nearly 2000 feet. During the absence of Mr. Alfred Rickard, his nephew, Mr. Forbes Rickard will look after the interests of the company.

SILVER AGE MINING COMPANY.—It is reported that the Franklin lode, an adjoining claim, has been purchased for about $20,000. Work in the Silver Age mine continues with favorable results. The work of enlarging the tunnel is progressing, but will take more time than at first expected. In doing this work streaks of pay ore have been opened in several places. The mill work drags, owing to the difficulty of getting lumber. The roads are still in such bad condition that the lumber cannot be delivered as fast as it is wanted for use. Bids are being received for the plant (electric) authorized by the board, and, as soon as the mill is ready, active operations on its erection will begin. There are about five car-loads of ore on hand ready for shipment.

GUNNISON COUNTY.

SYLVANITE.—The Chicago owners of the Sylvanite mine have employed V. F. Axtell to secure a statement of the indebtedness against the mine, created by W. S. Baker, who worked it as lessee, says the Crested Butte *Pilot*. The amount is somewhere in the neighborhood of $17,000. Mr. Baker is now in Boston working on a sale. It will be remembered that the Sylvanite Mining and Milling Company was organized last fall with a capital stock of $5,000,000, par value $10. The stock was listed at the New York Consolidated Stock and Petroleum Exchanges, last October, at $3 (See ENGINEERING AND MINING JOURNAL, October 27th, 1888), and it is said the owners have already received a payment on the sale.

LAKE COUNTY.

The Leadville Tunnel Company is still sinking the Argentine shaft in Tennessee Park. Considerable trouble has been had with the pumps during the past two or three months, and but little progress has been made in the bottom of the shaft. Sinking has now been resumed, however. The shaft is about 300 feet deep; is not yet out of the wash, is making considerable water, and is costing the company a considerable amount of money.

AGASSIZ CONSOLIDATED MINING COMPANY.—The big concentrator erected by this company to treat—as per contract—at least 200 tons a day of crude material from the Wolftone shaft, it is stated, has so far given very indifferent satisfaction to those really interested. It appears that the whole trouble lies in the application of sizing apparatus.

HENRIETT AND MAID CONSOLIDATED MINING COMPANY.—About 7000 tons were produced in May. Of this amount one half has been marketed, the other half having been added to the storage pile. The Knowles pump for the Maid has arrived and will be placed in the station already excavated at a point 642 feet from the surface. It is said to have a capacity of ejecting 1000 gallons of water per minute. As soon as this pump is placed and working the Maid shaft will be sunk at least 20 feet deeper. Mr. D. H. Moffat, already a large shareholder in this company, recently purchased the interest of ex-Senator Tabor. The latter owned one-sixth of the shares of the company, and the price paid for them is said to have been $185,000. Mr. Moffatt now owns the controlling interest.

LITTLE CHIEF MINING COMPANY.—On May 28th the Sheriff of Lake County conveyed by deed the entire property of the Little Pittsburg to the Little Chief Company, as already mentioned in our last issue, to satisfy in part a certain judgment rendered in the District Court of Lake County in 1884 for $23,589.70. The property thus conveyed embraces the Little Pittsburg, Dives, New Discovery and New Discovery extension, numbered respectively United States surveys 293, 294, 386 and 387, also the Union, a fraction of the Amie, and the Winnemuc, the latter three combined being less than half a full claim. With the real estate are also conveyed all right, title and interest in and to the buildings of every name and nature, engines, boilers, pumps, and platform scales on the Little Pittsburg ground.

LOUISVILLE.—Preparations are being made to sink the Colorado No. 2 shaft of the Louisville—700 feet deep—to a further depth of 100 to 150 feet. The mine produced only about 1000 tons last month, much of the labor on the property having been confined to prospecting. Mineral has been long since developed in a winze east of the shaft at a point 70 feet below the bottom.

REED.—This mine, in St. Keven district, immediately west of Leadville, is now producing largely. A contract has been awarded for the erection of a concentrating plant to cost $10,000.

OURAY COUNTY.

MICKY BREEN MINING AND MILLING COMPANY.—It is proposed to reorganize this company, whose property is located in the Uncompahgre mining district. It consists of eight claims, near Ouray. The first mines purchased have been worked upwards of a year. Within the past two months the company decided to purchase five other patented claims, and to push forward the cross-cut tunnel some 500 feet further to intersect the vein running through the new properties. The money necessary for the opening and developing of these mines has heretofore been furnished by Messrs. L. L. Culver, Judge J. E. McKeighan and A. A. Mosher, who virtually owned the mines, but since the acquisition of the new properties it has been voted to reorganize the company, with a capital stock of 200,000 shares at $10 each, to be fully paid up, and non-assessable. The sale of this stock provides all the means necessary to push the tunnel forward to intersect the vein and to do whatever else may be essential to open and develop the new mines.

PITKIN COUNTY.

According to reports from Aspen, the Boston & Colorado Smelting Company intend to build a smelter in that valley during the present summer. Senator N. P. Hill has been at Aspen and is reported to have said that the company will put in a 200-ton plant. The location has not yet been decided on, the question being whether they shall build near the coal or near the mines. This smelter will handle low grade ores exclusively, those that will not bear transportation over the range. The railroads will make favorable rates for such works.

SAN JUAN COUNTY.

SAN JUAN CHIEF.—It has been decided to carry on vigorous development on the mine, which is situated at Mineral Point, and also to build a concentrator.

SAN MIGUEL COUNTY.

GOLD KING MINING COMPANY.—Preparations for resuming work on the Gold King are now well under way, and it is thought that active operations will be commenced shortly. During the past winter the directors of the company have decided upon doubling the capacity of the mill. While running the present mill, measures will be also carried on getting ready for additional stamps.

UNITED STATES GOLD PLACERS, LIMITED.—This company has been organized in London, with a capital of £150,000 in £1 shares. The object is to carry into effect an agreement made with W. Scott, the liquidator of the United States Gold Placers, Limited, for the acquisition of the assets, property, and liabilities of the United States Gold Placers, Limited. The num-

ber of directors shall not be less than three nor more than seven, the first to be appointed by the subscribers to the memorandum of association. Remuneration, £1400 per annum, divisible as they determine.

VALLEY VIEW MINING COMPANY.—This company, of St. Louis, whose property adjoins that of the Gold Kink, is said to be seriously contemplating bringing suit against the latter company to enjoin them from working in its claim, which it has every reason to think they are doing. It is said that the Gold King Company has made an offer to compromise, and this offer is now being considered by the Valley View Company.

SUMMIT COUNTY.

An important mining suit was called in the United States Court at Denver on the 1st inst. It is an equity suit wherein James C. Wood, of Ann Arbor, Michigan, is plaintiff and John A. Hall, John C. Meagher, Henry M. Woodford, Joseph Woodford, David Hatch, Andrew Greenleer, John Kirkham, John McHugh, James Doran, Alex. Hultz, John Gilligan, Charles Adams and Azor A. Smith, of Colorado, and C. H. Cramer, of Kansas City, Mo., are the defendants. Mr. Wood, in his complaint, alleges that he is the owner in fee and entitled to the immediate possession of the undivided five eighths of the mining property known as the New York Placer, situated in the Consolidated Ten Mile mining district, Summit County, except as to 13½ acres off the north end of the placer. Of this 13½ acres he is the owner of $\frac{3}{4}$. The petition for an injunction was denied, but leave was granted to amend the pleadings. The Denver *Republican* states that mining men in Denver, many of whom are quite familiar with the particulars of this case, declare that the ruling of Judge Hallett is correct in every detail. The defendants have spent in the vicinity of $25,000 in developing this property, and up to date are still out that amount.

DAKOTA.

HARNEY PEAK TIN, MINING, MILLING AND MANUFACTURING COMPANY.—The Ruby group of tin locations, located a mile and a half west of Custer, embracing 48 claims, upon which this company held an option expiring June 1st, has been transferred to that company, the full amount of the purchase price being paid in cash through the Bank of Custer.

The company has also secured a six months' extension of its bonds upon the Ainsley and Richardson ranches, located on French creek, three miles east of Custer, upon which $1000 was paid. These ranches comprise an unbroken body of land of about 300 acres, with water and timber.

LAWRENCE COUNTY.

IRON HILL MINING COMPANY.—A sample of the mill tailings from the Iron Hill mill were tested some months ago at San Francisco, by the lixivation process, with satisfactory results. The probability is that the mill will shortly be remodelled for the purpose of working them by the above process. The management expects to realize $35,000 or $40,000 out of them over and above the necessary expenses entailed remodeling the mill. It is reported that the company has between 300 and 400 tons of ore with which to start up the smelter. This amount has been taken in small quantities from the various seams and pockets, as the prospecting work of the past two years progressed.

IDAHO.

ALTURAS COUNTY.

MINNIE MOORE.—According to the Wood River *Times*, this mine shipped over 600 tons of ore and concentrates last month. As about six tons of ore are required to make a ton of concentrates, on an average, the shipments represent the extraction of about 3600 tons of mineral for the month, or over 100 tons per day.

BOISE COUNTY.

WASHINGTON.—A ten-stamp mill is to be erected at this mine which is located about nine miles northeast of Idaho City, in the immediate vicinity of the old Sub Rosa mine. The Washington lode was discovered several years ago, but only partial developments were made upon it until recently, when more active developments, it is said, have brought in sight a body of rich ore more than sufficient to warrant the expense that is now being made in preparation for working the mine on a liberal scale.

CUSTER COUNTY.

DICKENS-CUSTER MINES, LIMITED.—Mr. MacDermott, of Messrs. MacDermott & Duffield (London agents for Messrs. Fraser & Chalmers at Chicago), has been lately at the mines, having been instructed to make an exhaustive report thereon. The company has made a call of 6d. per share, payable on June 6th.

ILLINOIS.

A mass meeting of miners of Peru, La Salle, Oglesby, and Spring Valley was held in the latter place on the 4th inst. The matter of individual operators starting to work at last year's prices was left to the District Board to settle. A resolution was passed protesting against the sending of militia to Spring Valley and counselling peace.

MICHIGAN.

COPPER MINES.

QUINCY MINING COMPANY.—At the annual meeting held in New York this week the old officers and directors were reelected, and it was voted unanimously to authorize the directors to increase the capital stock 10,000 shares to 50,000 shares, for the purpose of providing for improvements at the mine, including the new stamp mill, which procedure is preferred to drawing on the surplus, in view of prevalent copper market conditions. In our issue of May 25th we already referred to this matter.

MONTANA.

BEAVER HEAD COUNTY.

GOLDEN ERA MINING COMPANY.—The company is said to be spending considerable money for developing its property. It has a small steam hoist, and has reached a depth of 300 feet and four levels. The winze from the third to the fourth, with the drift in progress on the latter, is showing up well. Within the past year the shipments netted, after paying freight and smelting charges, about $38,000, and there is a quantity of third-class ore on the dump which will pay for working over screens and washing. In sinking the shaft passed through shale and is now in quartzite. First-class ore averages about 30 per cent lead, 20 ounces silver, and $28 gold.

LONE PINE.—Messrs. Spratt & Co., of Michigan, have made the second payment on this mine at Deweys Flat. The Patridge Brothers shipped about $10,000 worth of bullion a short time since. This was their product for April with the little mill which crushes about five tons per day. A 10-stamp mill, with all the modern appliances for saving the contents of the ore and also for hauling it at a minimum cost, is to be erected.

DEER LODGE COUNTY.

BI-METALLIC MINING COMPANY.—It is said to be the intention of this company to add fifty additional stamps in course of time.

ELIZABETH MINING COMPANY.—Mr. L. A. Coquard of St. Louis, who made objections to the re-organization of this company, as mentioned in our last issue, has bought 10,000 shares more of the West Granite stock, and has begun suit against both the West Granite and Elizabeth companies to prevent the consummation of the deal. His complaint reads: "The said action is brought to enjoin and restrain the trustees of the West Granite Mountain Mining Company from carrying into effect the action of the stockholders of said company, had at their meeting of May 8th, 1889, and to enjoin said board of trustees from making any conveyance or transfer of any of the property of said company to Charles S. Taussig or any other person; and to restrain and enjoin said defendent, Charles S. Taussig, from in any way selling, transferring or conveying any of said property to the Elizabeth Mining Company or any other corporation or person; to have the proceedings of the stockholders of the West Granite Mining Company, had at their meeting May 18th, 1889, set aside; to have the proceedings of the board of trustees of said company, had at their meeting May 30th, set aside; to remove a cloud from plaintiff's stock in said company, and from the property of said company, and for costs of suit."

LEWIS AND CLARKE COUNTY.

JAY HAWK MINING COMPANY, LIMITED.—This company has been organized in London with a capital of £150,000 in £1 shares. The object is to acquire from the Jay Hawk Mining Company, Limited, and the liquidator thereof, the mines and mining property of the companies known as Jay Hawk, Mountain Top, Rocky Mountain Gift, Mayflower and Monadnock, lode claims and four mill sites and a tunnel site and all other the property and assets of the company, and to work and develop the mines so acquired.

MEAGHER COUNTY.

MAGINNIS MINING COMPANY.—At a meeting of the stockholders of this company held at Helena last week the proposition to dispose or sell the property was ratified, and the matter was placed in the hands of the trustees.

SILVER BOW COUNTY.

BOSTON AND MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The product for May was 2291 tons of copper and silver matte, yielding 2,520,100 pounds of refined copper, and 33,000 ounces of silver. The company has made in May the largest product for a single month, both of copper and of silver, in its history.

CLIMAX MINING COMPANY.—This company, a successor to the Apex Company at Divide, has completed the erection of its five-stamp mill, and it is now ready to begin running. It was built for the company in Butte. The results of its operation will be awaited with interest, as it is the first mill to run in ore in the Divide District.

LEXINGTON MINING COMPANY.—The work of sinking the shaft to the 1400 foot level progresses but slowly. The shaft cannot be taken down faster than at the rate of about 40 or 45 feet per month. It will take six months to complete the shaft. No crosscutting will be done until the 1400 level is reached. At this depth, 1400 feet, it will be necessary to crosscut 300 feet in order to reach the vein. This work cannot be done at that depth more rapidly than at the rate of 60 feet per month, and another five months will be thus consumed. No one can tell how far drifting on the vein will be necessary before an ore body will be struck, but it is safe to say that it will be a full year from the commencing of this work before any definite result of it can be announced to the public. The Butte *Inter-Mountain* states that while hoping for the best, Superintendent Rueger is frank to say that on the present lowest level of the Lexington there is absolutely nothing. Ore bodies of good grade are few and far between, and concentration offers no practicable solution for the profitable handling of the large masses of low grade rock. The mine has been thoroughly prospected, and during the superintendency of Mr. Wartenweiler, 22,000 feet of dead work was done.

ORO FINO SILVER MINING COMPANY.—This company has been organized to work the Sunday and True Racket claims. It is capitalized at $3,000,000. The officers are Dr. Mussigbrod, President; N. J. Bielenburg, Vice-President; Lew Coleman, Treasurer, and Ed. Scharnikow, Secretary. The properties have shafts eighty and thirty-five feet deep and the indications are fair. One hundred thousand shares will be put on the market at 20 cents, the money thus obtained to be used as a development fund.

POLLOCK MINING AND MILLING COMPANY.—Notice is hereby given to the stockholders of the Pollock Mining and Milling Company, a corporation created under the laws of Montana Territory and carrying on business in Silver Bow County, in said Territory, that, pursuant to order of the board, a meeting will held at Butte on the 13th day of July. The object and purpose is to submit a proposition authorizing the trustees to sell to Ellis Wainwright the Glengarry lode mining claim. This property proposed to be sold does not include all the real property of the company, but is only a portion thereof.

NEVADA.

ELKO COUNTY.

COMMONWEALTH MINING COMPANY.—The company has shipped $12,000 in bullion, the result of three days' run. The mill is now in running order, and the returns will be remitted as they come in, without regard for regularity in dates.

ESMERALDA COUNTY.

CONSOLIDATED ESMERALDA MINING COMPANY, LIMITED.—The superintendent, under date April 30th, reports "that the last run at the mill realized bullion to the extent of about $23,000 from 736 tons of ore. The clean-up was better than expected. The yield was increased by some very rich ore showing free gold. This body of ore, now in sight in the lowest level, is 2½ feet thick. The south drift on the 375 level continues to carry some fair quality of ore. The ledge is 2½ feet wide and looks well generally. The north drift is in broken ground, but it is hoped to get a change during the week." Mr. Colcord, the superintendent, started on the 30th of May for London for the purpose of being present at the annual meeting.

EUREKA COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—We are informed that the Eureka smelter will start up on June 15th instead of on the 1st inst. as originally intended. It is the desire of the superintendent to secure a quantity of custom ore, which is worked together with the company's ore sufficient to insure an uninterrupted run. It is thought that the necessary amount has now been obtained. Development work is being carried on steadily. A new drift has been commenced from the 800-foot level running into the virgin ground of the "K. K" property. It is understood that the company proposes to spend at least one thousand dollars per month in prospecting and development work.

LINCOLN COUNTY.

The iron mining locations in Silver King district have been bonded to San Francisco capitalists, and development work on the claims will soon begin. Silver King district lies 25 miles northwest of Bristol, and is somewhat difficult of access.

STOREY COUNTY—COMSTOCK LODE.

ALTA MINING COMPANY.—The following statement shows the production of this company for the quarter ended March 31st. According to the sworn statement filed at the County assessor's office, 1949 tons of ore were extracted, showing an average value of $20.31 per ton, and 99 tons of concentrates, the total bullion yield of which was $77,409.92; cost of extraction, transportation and reduction, $78,217; cost of production above yield, $747.08. Statements of other leading Comstock mining companies were published in our issue of May 18th.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The bullion shipments on May account amount to $133 409 89. The California battery mill is ready to begin dropping its stamps on Consolidated California & Virginia ore whenever the flow of the Carson River decreases to an extent that will require the hanging up of the stamps at the Eureka. The ore yield of the mine will be kept up to the present average of above 400 tons daily throughout the current year.

SUTRO TUNNEL COMPANY.—The company has removed its New York office to the Boreel Building, No. 115 Broadway. The extension of the Sutro tunnel into the west country has been decided upon, and work will probably be commenced about the 1st of August next.

YELLOW JACKET MINING COMPANY.—The company is pushing operations on a 500 level west drift which has for its objective point a vein whose croppings carry a considerable amount of free gold. It is expected to cut this vein in going 2000 feet, and tap it at a vertical depth of 1500 feet.

NORTH CAROLINA.

RANDOLPH COUNTY.

NEW HOOVER HILL GOLD MINING COMPANY.—It is reported from London that the directors of this company have sold through Messrs. Pixley and Abell, the bullion obtained during the month of April, weighing 173 ounces, which realized £582 15s. 10d.

OKLAHOMA TERRITORY.

It is reported that rich iron ore deposits have been discovered near Guthrie. A shaft will be sunk at once and a thorough examination made. Whether or not this report is simply one of the "boomlets" that are so plentiful in the new territory, the JOURNAL is as yet unable to say, but at all events we are pleased to record the first item of mining news from this section.

PENNSYLVANIA.

COAL.

The Schuylkill Coal Exchange has issued a report dated Pottsville, June 1st, showing that the following collieries drawn to return prices of coal sold in May, 1889, make the following returns to determine rate of wages to be paid: Alaska shaft (P. & R. C. & I. Co.), $2.27; Eagle Hill, $2 34·9; Girard, $2.26·3; Kohinoor, $2.35·4; Shenandoah City, $2.27·5. The average of these prices is $2.30·2, and the rate of wages to be paid is seven (7) per cent below $2.50 basis.

H. C. FRICK COKE COMPANY.—This company has put in operation at the Standard Works the first and only electrical watchman-detector in use in the coke region. In the office of the superintendent is a clock whose dial is a round sheet of paper that revolves as would the hour hand on a regular time piece. From this are wires running to the ten stations about the entire plant, store, slope, boiler house, tipple, fan house, stable, two at the crusher, two at the new shaft and one at the stables in the pit. On reaching each of these stations the watchman turns the box with his key, and the time he does so is punched through the station's number on the office dial.

LEHIGH & WILKES-BARRE COAL COMPANY.—The company's mine at South Wilkes-Barre was to start on the 3d inst. It is expected to be one of the largest producers in the region.

NATURAL GAS.

The Oliver Iron and Steel Company and the Republic Iron Works, of Pittsburg, are about to begin operations on a new Pittsburg natural gas line that will be to some extent a competitor of the Philadelphia lines. It will extend from Belle Vernon, a distance of 22 miles, and is to be a 16-inch main. The contract for the wrought iron pipe has been let to the National Tube Works and will cost about $12,000 a mile. The cost of laying it will be $5000 a mile, making the total cost of constructing the line about $500,000. The territory it taps is one of the richest in Western Pennsylvania and the builders of the line own large leases.

WESTMORELAND AND CAMBRIA NATURAL GAS COMPANY.—This company has suffered a great loss by the recent flood. Mr. W. C. Steele, secretary of the company, states: "Our company alone cannot replace its plant, which has been washed out, for less than $175,000."

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to May 31st:

	1889. Gals.	1888. Gals.
From Boston	1,608,441	930,426
Philadelphia	51,719,302	46,919,371
Baltimore	1,277,883	1,323,053
Perth Amboy	8,427,592	9,038,018
New York	159,999,860	141,254,972
Total exports	223,033,078	199,465,870

TENNESSEE.

TENNESSEE COAL, IRON, AND RAILROAD COMPANY.—Official reports to us show that the production during May of the Tracy City Division amounted to 13,862 tons of coal and 8007 tons of coke, making a total for the five months of 1889 of 72,753 tons of coal and 54,216 tons of coke.

VIRGINIA.

STAFFORD COUNTY.

LEE MINE.—It is understood that efforts are being made to place this property in New York. It is in the vicinity of the Rappahannock Gold Company's property, the stock of which has been listed upon the Consolidated Stock and Petroleum Exchange, New York, for years.

WASHINGTON TERRITORY.

KING COUNTY.

A fire broke out at Seattle, at two P. M., on the 6th inst., and by 4.30 P. M. was raging over a district of five or six blocks with tremendous fury. At 9 P. M. thirty-one blocks had been burned in the heart of the city, and there is imminent danger to the loss of about twenty blocks more. The fire was not at all under control, and had reached the great coal bunkers, from which it was likely to be communicated to a large number of wooden buildings.

FOREIGN MINING NEWS.

BRITISH COLUMBIA

The Irondale Iron-Works, Port Townsend, which have been two years in operation, have increased their capital to $1,000,000, says the Canadian *Mining Review*, and are going to erect rolling mills for the manufacture of steel and wrought-iron, in addition to their present output of first-class pig-iron, which is in much demand at the Union Iron-Works, San Francisco. Their facilities for shipping and transhipping are good. Their magnetic iron ore from their mines located on the southwest coast of Texeda Island, B. C., is of excellent quality. The ore is simply quarried out of a high bluff of iron ore close to the shore. It is conveyed by steamer to Irondale, Port Townsend, W. T., and mixed with some iron ore found near Irondale, of a limonite character. Lime is shipped from San Juan Island for fluxing, and at little cost of transportation. The company are now employing 400 men or more in mining, making charcoal, and smelting, and it is reported that about 40 tons daily of pig-iron is produced. The head office is at San Francisco, Cal.

KOOTENAY SMELTING AND TRADING SYNDICATE, LTD.—This company, which is an English organization, is building a lead smelting plant at Revelstoke, consisting of a complete sampling mill, a 17 and 72 reverberatory roaster and a 36 × 72 water jacket pace, patterned after the Denver furnaces. It expects to have the works up to begin operations some time in August.

CANADA.

PROVINCE OF NOVA SCOTIA.

JOGGINS COAL MINING ASSOCIATION.—At an adjourned meeting of this association held recently a letter was read from R. G. Leckie, of the Cumberland Coal & Iron Company, of Springhill, stating that he would withdraw the 5 per cent commission stipulated in his offer, and would allow it to stand at $200,000 net. After a general discussion it was decided to adjourn the meeting until the 5th of June, and get in the meantime an expression of opinion from the stockholders on which the meeting might act. The mines at present are under lease to the Phœnix Coal Company, and the members of that corporation, many of whom are also shareholders of the Joggins Association, are adverse to the sale, for they are now making money out of the mines, and expect to do still better in the future, as the railroad facilities for shipping will be improved. Should the mines be sold, the Joggins Association will have to pay the present debt and the Phœnix Company for their improvements.

CENTRAL AMERICA.

HONDURAS.

PUEBLO MINING AND MILLING COMPANY.—This company has been organized at Denver under the laws of Colorado with a capital stock of $100,000. Operations are to be carried on in Honduras. The incorporators are M. D. Murray, Beaufort Carpenter and John Downen.

MEXICO.

LA TRINIDAD COMPANY, LIMITED.—It is reported that the company, which is an English organization incorporated, has given up the idea of making the property self-sustaining, the owners refusing to contribute any more money for its development.

LOS NUEVOS MINAS DE SANTA MARIA G. & S. MINING CO.—The famous mining suit in which Mrs. Mary Beadleson was the plaintiff and Asbury Harpending and John A. Alley the defendants, has not yet been settled. It was thought a few months ago that the case had been settled, and as stated in our issue of March 2, a judgment adverse to the defendants was obtained. The findings and an interlocutory judgment were signed by the judge and delivered to the counsel for the plaintiff to be filed. They were not filed, however, but were held pending negotiations for a settlement. These were successful, and last February an order of discontinuance was filed. This arrangement was interfered with, however, by the United States Trust Company, which had been appointed a receiver for the mining company. It came into court, and on the ground that it had not been duly informed of the proceedings, asked that the order of discontinuance be set aside, and that the findings and interlocutory judgment against Harpending and Alley, who were officers of the company, be filed. Judge Bartlett, in Brooklyn last week, handed down a decision setting aside the order of discontinuance and directing the papers to be filed as of the date when delivered to counsel.

STATE OF TLALPUJAHUA.

CONCEPCION MINING COMPANY.—A reorganization has been effected at a meeting of the stockholders held in St. Louis last week, on the following basis: 250,000 shares, par value $1, 50,000 of which are to be subscribed for by the stockholders, 100,000 to be retained in the treasury, and 100,000 shares to be turned over to the Concepcion Company for the property. Articles of incorporation have been applied for at Jefferson City, Mo., and as soon as they are received the new company will be organized.

SOUTH AFRICA.

A London correspondent of the Boston *Herald* says: Mr. Edward Bates Dorsey, the well known American engineer, has recently returned from South Africa, where he had gone on behalf of an English syndicate of capitalists to examine into the possibilities of profitable railroad construction in the Transvaal. Mr. Dorsey called at your London office with a glowing account of the state of affairs in the Transvaal. There is nothing there but gold to lend value to the place, but there is any amount of that. Mr. Dorsey says that South Africa is going to Eclipse California and Australia combined. There is no opening for the little speculator with his pick and shovel, as no alluvial gold has been found in paying quantities. All the gold is in compact veins, and requires mills and capital to get it out. In the Johannesberg district the veins are found lying at about 25 degrees from the horizontal, and probably, as they go deeper down, the slant from the horizontal will materially diminish. The geological conformation is similar to that in the coal regions. Good coal for fuel is found within 300 feet of the mine. An outcrop of veins has been found on the north side of the Johannesberg basin and is being properly worked for 25 miles in length, east and west. It has been traced 50 miles southeast and south, and though not properly worked is very profitable. There are 800 stamps running now, crushing 40,000 tons of ore a month and producing an average of 30,000 ounces of gold.

SOUTH AMERICA.

VENEZUELA.

CARUPANO MINING COMPANY.—At the annual meeting of the stockholders of this company, held recently in New York, the following officers were elected: E. J. Stevens, President; W. T. Hotchkiss, Vice-President and Treasurer, and S. G. Myers, Secretary. Mr. Hotchkiss was seen this week by a representative of the ENGINEERING AND MINING JOURNAL. He said: "The property of this company consists of the old Columbia mine about three miles from the seaport town of the Carupano in Venezuela. The mine was worked years ago by the natives and abandoned. Some time ago French parties became interested in the property, and did considerable development work upon it. In July, 1887, the present company took hold of it and modern machinery was placed upon the ground. The mine is worked by means of a main shaft, known as the Marquez, which is about 175 feet deep, and by a tunnel which runs into the side of the mountain for a distance of 300 feet and connects with the main shaft at a depth of 150 feet. The ore carries, as a rule, about 35 per cent lead, 10 per cent copper and 18 ounces silver. We have also recently struck a gold vein which thus far has averaged about six ounces to the ton. About 50 men are employed. There are about 2,000 tons of ore on the dump. Transportation to the town of Carupano is so easy that we intend to use traction engines on the road from the mine. Up to October last we shipped our ore to New York, but at that time we became involved in a dispute with the Collector of the Port in regard to what we thought was an unjust interpretation of the tariff law, and since then we have stopped shipments altogether. Recently, however, we have closed contracts by which our concentrates will be shipped abroad." The company has removed its offices from 57 Broadway to the Tower Building, 50 Broadway, New York City.

MEETINGS.

Branchville Ore Mining Company, 7 Nassau street, New York City, June 11th, at twelve o'clock noon.

Central Coal Company, of Pennsylvania, Hotel Lafayette, Philadelphia, Pa., July 9th, at twelve o'clock, noon.

Coalburg Land and Mining Company, 69 Wall street, New York City, June 10th, at twelve o'clock noon.

Hudson Tunnel Railway Company, 2 Nassau street, New York City, June 12th, at twelve o'clock noon.

United Nickel Company, 239 Broadway, New York City, June 14th, at twelve o'clock noon.

Quicksilver Mining Company, 20 Nassau street, New York City, June 19th, at one o'clock P. M.

DIVIDENDS.

The following dividends have been declared:

Caledonia Gold Mining Company, of Dakota, dividend No. 12, eight cents per share, or $8,000, payable June 26th, in San Francisco, and by Laidlaw & Co., 14 Wall street, N. Y. City.

Consolidated California & Virginia, of Nevada, dividend No. 29, fifty cents per share, or $108,000, payable June 10th, in San Francisco.

Deer Creek Gold Mining Company, of Idaho, dividend No. 2, five cents per share, or $10,000, payable June 15th at No. 60 Broadway, New York City.

Granite Mountain Mining Company, of Montana, dividend No. 54, fifty cents per share, or $200,000, payable June 10th in St. Louis.

Napa Consolidated Quicksilver Mining Company, of California, dividend of ten cents per share, or $10,000, payable July 1st.

Pamlico Mining Company, of Nevada, declared on 31st ult., dividend of $3000.

Silver Mining Company, of Lake Valley, N. M., dividend No. 2, five cents per share, or $25,000, payable June 20th, at No. 119 South Fourth street, room 62, Philadelphia, Pa. Transfers close June 13th.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Bellevue-Idaho, Id.	....	May 11	June 17	July 6	.10
Belle Isle, Nev.	12	Apr. 19	May 23	June 13	.10
Bulwer Cons., Cal.	5	Apr. 10	May 15	June 12	.25
Cora, Dak.	4	Apr. 27	June 1	June 25	.05
East Jackson, Mich.	....	Apr. 19	May 1	....	.25
Equitable T., Utah.	34	May 14	June 20	July 15	.05
Found Treasure, Nev.	5	Apr. 10	May 16	June 6	.12½
Gould & Curry, Nev	62	May 1	June 5	June 27	.30
Kentuck, Nev.	18	Apr. 26	May 29	June 19	.30
Locomotive, Ariz.	4	Apr. 25	May 25	June 18	.05
North Rapidan, Nev.	3	May 1	June 10	July 10	.01½
†Pinal Cons., Ariz.	9	May 15	June 21	July 12	.05
Ophir, Nev.	55	May 11	June 13	July 2	.50
Rainbow, Dak.	4	May 6	June 7	June 26	.01
Silver Hill, Nev.	24	Apr. 20	May 23	June 13	.20
Trinity River T. & Mg., Cal.	1	Apr. 11	May 14	June 3	.07½
Union Cons., Nev.	38	May 13	June 19	July 10	.25
Weldon, Ariz.	13	May 13	June 18	July 9	.10
Yellow Jacket, Nev.	46	Mar. 28	May 1	June 1	.50

*Delinquent day and day of sale postponed to dates given above.

†Notice is given that assessment No. 8, of ten cents per share, levied April 13th, 1889, upon the capital stock of the Pinal Consolidated Mining Company was rescinded by the directors at a meeting held May 15th, 1889.

MINING STOCKS.

New York.

FRIDAY EVENING, June 7.

Fluctuations in the market for mining shares are as yet unimportant and speculative interest is conspicuously absent. Nevertheless, the condition of the mines generally is encouraging and values show no signs of weakening.

The Comstocks are still in small demand and prices show but little change. Consolidated California & Virginia is down to $7·63. The company has just declared its usual monthly dividend of $108,000, but it is stated that the July dividend will be passed.

Sutro Tunnel shows a small business at 8@9c., and the Trust Certificates at 50 to 52c.

The Tuscaroras are weak, notwithstanding the reported good prospects of the different mines. Navajo declined from 65 to 55c., and Belle Isle from 40 to 30c. North Belle Isle shows one transaction at $1.50, and Del Monte ruled at $1.25.

There was some activity in Martin White, which advanced from 70 to 90c.

Horn Silver has been in better demand, selling at $1.20 this week on account of more encouraging reports from the mine. Mr. A. J. Harrison, the secretary of the company, informs us that the ore sales for April were lower than usual, as more attention was devoted to mine timbering and development work than to ore extraction. The April sales amounted to $7,800. Mr. Harrison believes that for May the product will amount to at least $30,000. The monthly expenses average $8,000. Notwithstanding the comparatively small amount realized from the ore during April, the secretary says that enough was received from sales of ore and supplies and other sources to add $6000 to the amount of cash in the company's treasury, making a net surplus of $180,000 on May 1st. Furthermore, according to the same authority, if the May product proves as large as anticipated, the company will have a surplus of $200,000. As this amount is certainly large enough to justify sanguine expectation, stockholders are anxious to know whether or not a dividend may be counted upon shortly. Secretary Harrison says he is unable to officially state the policy of the management in this respect, but he believes that the officers are inclined to proceed cautiously in such a matter, and that no dividend will be declared until the company can afford to pay several in succession and still have an ample surplus to provide for future development work and all contingencies. Ontario shows one sale at $35.

Reports from Dakota state that higher figures will soon be seen for Iron Hill, which at present is selling at from 35 to 39c. There has been but little demand for Homestake stock this week. Sales were made at $9@$10. The annual stockholders' meeting will be held in San Francisco on Tuesday next. Caledonia appeared on the list only to-day, when it sold at $3@$3.05. Sullivan Consolidated continues to be active at $1.25.

There was one sale of Amador at $1.60. Astoria continued to sell at 20c., and Middle Bar at 28 and 29c.

Great interest is being shown in the coming annual election of officers of the Bodie Consolidated Mining Company, there being two parties who are very anxious to have the control. The stock attracts little attention in this market; a few sales were made at from $1.90 to $1.95. Bulwer was firm at 50c. and Mono at $1.70 and $1.75.

The expected revival in Plymouth Consolidated has not yet made its appearance. Work is progressing satisfactorily at the mines, and it was expected that as soon as everything was in running order again the stocks would rapidly climb to the figure it was quoted at before the fire occurred.

The business in Brunswick is small, and there seems to be at present but little prospects of great activity in this stock in the near future. Sales were made this week at ·06@·07.

Quicksilver Preferred holds its own at $39.

There seems to be little likelihood of any further steps being taken by the Eastern stockholders of the Hector Gold Mining Company. The committee, consisting of Hermann Cohen, Charles H. Badeau, and George Holmes, which was appointed some time ago to look out for the Eastern shareholders' interest, decided this week to refund the money that has been contributed for the purpose of bringing suit to restrain the levying of the assessment, as the amount received was insufficient and as the effort at any rate was likely to be futile. We imagine that very little stock, assessment paid, is now held in this city. The latest reports from San Francisco are to the effect that the company is making preparations to resume work upon the property.

No interest is shown in El Cristo; a small business was done at from $1.50 to $1.70.

Mutual continues to sell at $1.45, but the stock is not near so active as it was a few weeks ago.

There is only a small demand for United Copper which is at present selling at from $1.05 to $1.10.

Silver mining of Lake Valley for which there is little demand in this city, but in which many of our readers are interested, has just declared a dividend of $5 per share or $25,000. This is the first dividend paid since June, 1888.

The stock of the Little Pittsburg Mining Company will be stricken from the list of the Consolidated Stock and Petroleum Exchange on August 1st. This date was fixed upon, as, according to the rules of the exchange, members are allowed sixty days within which to close their contracts on such stocks. The shares, of course, are now valueless. No sales were made this week.

The Ward Consolidated Mining Company of Colorado, to which we referred in our issue of April 27th, has made application to the committee on Mining Securities of the Consolidated Stock and Petroleum Exchange, to have its stock listed for dealings on the exchange. It has a capital stock of $2,000,000, shares of $10 each. On May 2nd the company paid a dividend of $10,000. A sale of Aspen Manufacturing and Smelting Company stock was made as low as $10 this week. This is the par value of the stock. The decline, trifling although it was, was due to a forced sale by a party who desired to realize on his shares, and consequently cannot be attributed to any unfavorable news from the mine. The president of the company informs us that work is progressing steadily and satisfactorily. The regular meeting of the directors will be held next week, and the usual dividend will probably be declared. Plutus a few at 90c. Little Chief was only dealt in on Saturday at from 33 to 36c. Leadville was also neglected; 800 shares changed hands at ·12 and ·13c. Colorado Central, which is rarely dealt in at the present time, brought $1.70. Silver Cord declined from ·60 to ·57. Lacrosse was active, and shows a business of 14,200 shares, the price ruled all week at ·09c., but to-day a sale was made at ·08c. Cashier advanced from ·03 to ·05c. We understand that the Cashier re-organization scheme will probably be successfully consummated next month. The bondholders intend to foreclose upon the property, and will then organize a new company, admitting the old stockholders on favorable terms. Ex-Police Commissioner Stephen B. French, of this city, will be president of the new company.

The price of Rappahannock continues at ·07c.

The business in Phoenix of Arizona amounted to 2600 shares, and the price went from ·20 to ·25.

There is little doing in Kingston and Pembroke; one sale was made at $1.25.

Moulton, which has during the last few weeks demanded considerable attention, shows a large business this week and was daily dealt in. The price was steady at from 42 to 47c. One sale of Alice was made at 90c.

Boston. June 6.

[From our Special Correspondent.]

The transactions in copper stocks the past week have been chiefly confined to Boston & Montana, which, under the excellent showing for last month in its product both in copper and silver, has advanced on good buying orders from outside parties from $32¾ to $39½, the sales aggregating up to noon to-day over 13,000 shares. This stock is the favorite at present, and it is doubtless selling very cheap even at the advance, and will no doubt sell much higher in the future, especially if a favorable arrangement is made with the foreign holders of ingot copper to maintain quotations at or about present prices. The balance of the market has ruled dull, but quite firm, with Calumet & Hecla selling at $218. Franklin at $10. Atlantic at $9¼. Osceola at $9¾@$10, and Kearsarge at $5½.

Quincy, on small sales, declined from $54@$52, and Tamarack from $107@$105, both of which, at these prices, ought, and doubtless will, show good profit to the purchasers ere the year expires.

Allouez sold, assessment paid, at $1, and is doubtless a good purchase at this price.

Santa Fe has improved, and shows an advance from 55c.@75c. If this stock, which sold at $2 50 in February last, and was considered then as worth the money, it surely is very cheap at the low price prevailing for it the past two months, and no doubt a good handsome profit will be realized by purchasers at the present time. Bonanza is steady at 80c., and has, we think, touched its lowest point for the year.

There is nothing doing in the balance of the list, as there seems to be no disposition to take hold of such stocks as National, Huron, Pewabic and others of like character, but we look for activity in them later on in the season.

In silver stocks Dunkin is still the only one dealt in to any extent, and just now that is rather quiet, with sales at $1.20. It is rumored that the company is about to purchase some adjoining territory which will enhance the value of their property.

Honorine sold at 37½c. asst., 5c. paid.

Catalpa dull at 15c., but very little doing in it.

LATER PRICES.

(*By Telegraph*) June 7th, 1 o'clock P. M.—Calumet and Hecla offered at 219; Tamarack, 105¾; Boston and Montana, 37¾; Kearsarge, 5⅛; Franklin, 10; West End Land, 28⅛.

San Francisco. June 7.

To-day's quotations by telegraph to the Consolidated Stock and Petroleum Exchange were as follows: Best & Belcher, $3.70; Belle Isle, 25@ 30c.; Bodie, $1.55@ $1.65; Cons. Cal. & Va., $7⅝@$7¾; Challar, $2.15@ $2.25; Crown Pt., $3.60; Eureka, $2.50; Gould & Curry, $2.55@$2.60; Hale & Norcross, $3.85; Mexican, $3.60; Mono, $1.35; N. Belle Isle, $1.10; Ophir, $4.25@$4.60; Pobose, $2.10; Savage, $2.15; Union Con., $3.50; Sierra Nevada, $2.75; Yellow Jacket, $3.80.

The market is as yet devoid of interest. Late advices say that relief from the present stagnation can only be obtained by united action on the part of the "magnates," or by the extension of the Sutro Tunnel westwardly through Mt. Davidson. The very commencement of the latter work, it is said, will inaugurate a revival of speculative interest. Few San Franciscoans believe that the riches of the Comstock lode are entirely exhausted, and the possibility of finding a bonanza by the extension of the tunnel will be duly appreciated by those indefatigable speculators.

Baltimore, Md.

COMPANY.	Bid.	Asked.
Atlantic Coal	$1.00	$1.50
Balt. & N. C.	.25	.29@ .30
Big Vein Coal	....	1.50
Conrad Hill	.05	.15
Cons. Coal	....	.26
Diamond Tunnel	....	.50
George's Crk. C.	....	112@115
Lake Chrome	.05	.20
North State (Balt.)	.20	.30
Silver Valley	.45	100

Prices bid and asked during the week ending June 6th

Kansas City. June 3.

Company	Par value.	Bid.	Asked.
Burch, L. & S., Mo.	$ 1	$...	$ .40@
Ida Hill, S., N. Mex.	100	...	100.00
K. C., Colo.	...	...	1.00
Kentucky, Z., Mo.	1	.20	.25
La Motte, Mo.	100	98.00	100.00
Maverick, S., Colo.	10	.97	1.00
Sonora, G. & S., Mex.	10	1.00	1.00
Standard, S., Colo	1	1.10	...
Templar, S., N. Mex.	1	.15	.35
Webb City, L. Z., Mo.	5	5.75	5.75@5.85
Wichita, L. C., Kan.	100	...	40.00
*Granite	...	...	....

Auction Sales of Stocks.

The following securities were sold at public auction in New York this week:

100 shares Accessory Transit Company, of Nicaragua	$6 lot.
25 shares Brush Electric Illuminating Company.	70
100 shares Delaware, Lackawana & Western Railroad	143 3-8
50 shares Standard Coal and Iron Company	11 lot.

Pipe Line Certificates.

[Specially reported for the ENGINEERING AND MINING JOURNAL by WATSON & GIBSON.]

The excitement attending the temporary stoppage of ticker service in Wall street, and the general interest manifested in the stock market, have taken away from the oil business what little interest previously existed in it. It can hardly be said truthfully that there is any petroleum market, and naturally brokers are anxious for this blockade to be broken, and would welcome a change in either direction, which would have to be somewhat pronounced in order to invite any speculation.

While the statistical possibility of Pennsylvania oil remains strong, showing as it does a constant reduction in the visible supply, the very bearish fact remains that Ohio is producing at a very low cost a grade of oil which it is now more generally believed than heretofore can be successfully refined. We think that the consideration of the latter fact will induce lower prices for the certificates which we are now trading in, and which we think are likely to have a sharp break at any time.

NEW YORK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 1.....	82⅜	82⅝	82¼	82¼	142,000
3.....	82	82⅞	81⅝	82⅞	187,000
4.....	82¾	82⅞	82¼	82¼	49,000
5.....	82½	83	82⅛	82¾	126,000
6.....	83	83	82⅝	82¼	55,000
7.....	82⅝	83	82½	82⅞	141,000
Total sales in barrels					700,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 1.....	82¼	83⅜	82¼	83¼	131,000
3.....	82⅞	83⅜	82⅜	82⅞	179,000
4.....	82¾	83	82½	82⅝	116,000
5.....	82¼	83¼	82¼	82¾	246,000
5.....	83	83¼	82⅝	82½	118,000
7.....	82¾	83⅛	82¾	83	108,000
Total sales in barrels					892,000

Electric Stocks. June 7.

The following closing quotations are reported to-day by J. Heron Crosman, New York City:

Stocks.	Par value.	Market price.
Brush	$ 50	$60 @ $80
" Illuminating	100	70 @ 75
Daft	100	45 @ 55
Consolidated	100	71 @ 75
Edison	100	185 @ 190
" Illuminating	100	87 @ 92
Julien	100	20
" Traction	..	13 @ 16
United States	100	50 @ 60
" " Illuminating	100	50 @ 60
Westinghouse	50	55 @ 57
Thomson-Houston	..	.....
" " Welding Co.	..	.....

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 7.

Statistics.

PRODUCTION OF ANTHRACITE COAL for week ended June 1st, and year from January 1st.

	1889.		1888.
Tons of 2240 lbs.	Week.	Year.	Year.
P. & Read. R.R. Co.	117,581	2,392,396	2,104,443
Cent. R.R. of N. J.	101,352	2,104,618	1,971,243
L. V. R.R. Co.	143,151	2,770,388	2,209,074
D., L. & W. R.R. Co.	97,082	1,620,030	2,614,385
D. & H. Canal Co.	76,967	1,421,005	1,762,814
Penna. R.R.	*45,060	1,357,718	1,732,292
Penna. Coal Co.	37,359	370,951	596,572
Penna. Canal Co.	*15,000	122,862	110,675
N. Y., L. E. & W.	*15,000	465,628	375,831
Total	648,492	12,625,596	13,477,329
Decrease	.....	851,733	.....

The above table does not include the amount of co a

consumed and sold at the mines, which is about six per cent of the whole production.

* Estimated. Official reports not received on account of the Pennsyvania storms

Production for corresponding period :

1884	11,528,445	1886	12,274,330
1885	10,582,639	1887	13,810,067

Owing to the unprecedented storms in Pennsylvania many of our coal reports have not been received. This will account for the non-appearance of our usual tables of bituminous production.

Anthracite.

The coal trade is in a somewhat better condition than we have been able to report for some time past. The great floods in Pennsylvania have stopped the output of many mines by flooding the mines and of many more by washing out the railroads and preventing the shipment of coal; in fact, the output of the anthracite regions has almost ceased for the past week and several of the mines will not be able to resume production for a considerable time. There is no lack of coal at tide water, however, owing to the large accumulation, which we reported on the first of the month, amounting to nearly one million tons, but the mere fact of the stoppage of shipments has brought about a firmer tone in the market, so that circular prices are more nearly obtained, and the demand for coal has also increased, owing partly to the fright which has come upon some consumers that they might be left short of supplies.

The Reading appears to have been the chief sufferer among the anthracite companies; much of its railroad and many of its colleries have been flooded.

Vessels are extremely scarce and freights are high in consequence. All of these things have had their effect upon the Eastern market. We continue our quotations and note that the outside companies are obtaining prices somewhat nearer these figures, though there is still more shading done.

F. o. b. New York shipping ports: Steamer and broken, $3.85; egg, $4; stove, $4.30, and chestnut, $4.

Bituminous.

The bituminous coal trade has suffered very severely by the floods. The Clearfield region, perhaps more than any other, has suffered from floods at the mines and from the total suspension of traffic on the roads. No coal has come forward from this district during the week and it will be some time yet before full shipments can be resumed, though it is expected that the Pennsylvania road will be opened to the Clearfield mines about Wednesday next. In the Cumberland region, the Chesapeake & Ohio Canal has been entirely destroyed. The Pennsylvania Road has not yet been able to resume traffic in this district; the Baltimore & Ohio has also suffered severely, though much less than the Pennsylvania Railroad. The Consolidation Coal Company has also lost a good deal of coal. The Chesapeake & Ohio Railroad has been very seriously damaged, and is not yet running through, while the Norfolk & Western has come out comparatively well (the Pocahontas region, in fact, is the only one which is prepared to ship coal to any extent at present). Vessels have been extremely scarce in Baltimore, and this has prevented the arrival of some coal which had accumulated there.

As the result of all these causes coal in this harbor and in the East is very hard to get, the companies that have some are keeping it for their regular customers, the steamships principally, and are unwilling to sell to outsiders at any price. A little coal is offered at fancy figures, but it is difficult to get a thousand tons in any direction. Some of the steamers will find it difficult to secure the necessary supplies to enable them to sail, and we hear of some mills that have had to stop already. This state of affairs is likely to become worse rather than better during the coming week, but after that it is believed that coal can be received again in any desired quantity. The scarcity of vessels has also affected the supply of bituminous coal very seriously and freights have advanced to what would be equivalent to $1.25 from Baltimore to New York alongside.

BOSTON. June 6.

[From Our Special Correspondent.]

"The principal news to-day is that they are mining more dead mules than coal," said a leading jobber to your correspondent. The fact is that the floods have seriously upset things. The Philadelphia & Reading and several of the companies are taking no orders. So far as can be learned here, many mining districts are overflowed, and still more are "underflowed," by heavy discharges from the springs. The Scranton Company is the least sufferer. A material curtailment of production must result, and there is a feeling here that the market will gain by it rather than lose. There was the usual dullness following upon the advance of the 1st inst. Many thought the advance would not materialize and would not place orders at the old prices. They are sorry now, for the effect of the floods will almost certainly be to maintain prices at present quotations. Just now jobbers report that shippers want two weeks in which to ship, and more in some cases In all probability the lowest prices of the season have been passed on anthracite.

In bituminous coal the bad results from the floods are even more pronounced than in the anthracite branch of the market. The Clearfield mines suffered very severely, according to all accounts, and may be crippled in the matter of deliveries for a long time to come. The Cumberland mines appear to have suffered less, but taken altogether there will not be much bituminous coal shipped, comparatively speaking, during the month of June. It is not a question of price but of delivery. Coal afloat will be good property now for some little time.

The Mystic Water-Works' contract for 2800 tons was taken at $3 92 delivered at Mystic Wharf. A bid of $3 75 was made, but not being accompanied by a certified check, was not entertained. This low price was made on a variety of coal not well known.

Freights are strong at $1 from New York and $1.15 from Philadelphia. The same rate of $1.15 prevails at Baltimore, but captains will not charter from Baltimore unless the coal is in sight. The floods will cause much detention, and it would seem as if freights must go lower for a while at least.

In retail circles business is very dull. Prices are nominally unchanged. Retailers are at present more interested in their forthcoming excursion than in anything else. The trip promises to be a great success. A party of about 75 will leave here on Tuesday next, and go to Scranton, Pa., making a stop in New York. They will inspect the Scranton mines and breaker and will return home on Saturday. The excursion tickets are $25 each.

BUFFALO. June 6.

[From our Special Correspondent.]

The result of the meeting last Friday of our local Coal Exchange was that the price of anthracite coal at retail was advanced. The new schedule is as follows: Grate and Egg, $4.75; Stove and Chestnut, $5; and Pea, $3.75 per 2,000 pounds, delivered in city limits. Trade quiet.

Bituminous coal unchanged in price, but market decidedly firm, with upward tendency in consequence of good demand and depleted stocks. Transportation will be seriously affected for some time, the result of the dangerous condition of several of the coal carrying railroads occasioned by the late heavy rains and subsequent floods.

A well-posted coal man says that "the prospects of getting coal from the mines is not very good at present." Another states "that the Pennsylvania Railroad will hardly be able to handle any coal for three weeks, and the Erie will need a week to get its road into shape for freight between Hornellsville and Elmira." A Lackawanna official says: "Our road is in better condition, but no coal will be shipped for a few days." In the meanwhile vessels are taking cargoes from the stocks on hand here.

The Delaware, Lackawanna & Western Railroad Company require some additional facilities for their coal docks, pockets, etc., near the foot of Erie street, in this city, and propose extending their tracks and connections. There was some opposition manifested in the Common Council Committee, but on Monday last a report favorable to the company was made on condition that the New York Central Railroad was allowed to cross the tracks at points indicated.

The bidders for supplying 7000 net tons of grate anthracite coal for the Buffalo City Water-works, to be delivered by canal during the present season of navigation, were Messrs. Henry E. Smith & Co. and Messrs. Albright and Smith, of this city. The price named by the former was $3.75 and the latter $3.72. The commissioners furnish steam for hoisting only.

Our Superintendent of Education has been authorized to obtain coal for the schools for one year without advertising for bids. Under the present arrangements of the dealers the cost of advertising would be thrown away, as no competition is possible.

There was a fair demand for lake freights, with quotations firm to Lake Michigan ports. A 10c. advance to Lake Superior ports will be noted. The disastrous floods in Pennsylvania will hinder coal transportation by railroads for periods varying from one to three weeks, but our stocks are so large that there will be abundant supplies for cargoes for some time to come.

The shipments of coal hence by lake from May 30th to June 5th, both days inclusive, were 64,690 net tons, namely, 19,070 to Chicago, 26,000 to Milwaukee, 2000 to Duluth, 1850 to Saginaw, 800 to Green Bay, 3200 to Ashland, 5450 to Superior, 600 to Houghton, 1170 to Sheboygan, 200 to Victoria Harbor, 2500 to Gladstone, 550 to Port Huron, 430 to Bay City and 850 to Muskegon; total for season to date, 380,450 net tons.

The rates of freight were 60c. to Chicago, Milwaukee and Sheboygan, 50c. to Saginaw, 45c. to Houghton, 55c to Ashland, 45@50c. to Superior and Duluth, 85c. to Manistee, 75@80c. to Muskegon, 50c. to Port Clinton and Port Huron, 60c. to Green Bay and to Gladstone, on owner's account.

The only shipment of coal by canal since last week was one boat load of 140 net tons, to Jordan, at 45c per net ton, free on and off. Receipts for same period, 2011 net tons.

Statistical.—Railroad receipts and shipments at this port not reported. Receipts of coal by lake thus far this season none. Shipments west for month of May, 254 710 net tons, as compared with 341,930 tons in 1888, and 240,080 in 1887; for season to May 31st, 360,570 net tons, as compared with 499,320 tons in 1888, and 349,870 tons in 1887. The receipts of coal by canal this season to May 31st, 3102 net tons, as compared with 1176 tons in 1888, and 955 tons in 1887; the shipments to May 31st, 843 net tons, as compared with 711 tons in 1888, and 600 tons in 1887.

FREIGHTS.

Freights from Chicago to St. Paul.—The Chicago, Burlington & Quincy Railroad and competing line from Chicago has announced a new classification on iron, steel and rails from Chicago to St. Paul and Minneapolis, commencing the 1st inst. These articles took sixth and fifth class rates on carloads and less. The rates now are: For car lots, 11 cents; less than car lots, 12½ cents, a reduction of 3 cents on the first, and 4½ cents on the last named.

Reduction of Rates on Iron from Detroit and Toledo.—A meeting of the freight agents of all railroads out of Detroit and Toledo was held at Toledo, O., on the 3d inst., to make reductions on rates for manufactured iron from these two points, to meet recent reductions made from Pittsburg and the Mahoning Valley. Rates were fixed at a figure that will allow the Eastern iron mills to compete with the Chicago reduction in prices. The principal rates fixed were: Youngstown to Chicago, 9 cents in car load lots; Toledo to Chicago, 7 cents; Cleveland to Chicago, 8 cents; Toledo to Indianapolis or vice versa, 7 cents; Toledo and Cleveland, 3 cents.

The following rates per ton of 2240 lbs. for coal charters are reported:

From Baltimore to: Bangor, 1.25; Bath, Me., 1.25; Boston, Mass., 1.15; Bridgeport, 1.00; Charleston, .75; Fall River, 1.00; Galveston, 3.70; New Bedford, 1.00; Newburyport, 1.35; New Haven, 1.00; New London, 1.00; New York, 1.00; Portland, 1.15; Portsmouth, N. H., 1.25; Providence, 1.05; Quincy Point, 1.15; Richmond, Va., .70; Salem, Mass., 1.15; Savannah, .90; Somerset, 1.00; Williamsburg, N. Y., 1.00; Wilmington, N. C., 1.00.

From Philadelphia to: Bath, Me., 1.15*; Baltimore, .60; Boston, 1.15*; Charleston, .75; Chelsea, 1.20*; East Cambridge, 1.15*; Fall River, .80@.90*; Georgetown, D. C., .85†; Gloucester, 1.10*; Lynn, 1.30*, New Bedford, .80@.90; Newburyport, 1.15@1.20*; New York, .90†; Norfolk, Va., .55; Portland, 1.15*; Portsmouth, N. H., 1.10*; Providence, .80@.90*; Richmond, Va., .60; Salem, 1.05*; Savannah, .90; Washington, .85.†

* And discharging. † Alongside.

METAL MARKET.

NEW YORK, Friday Evening, June 7, 1889.

Prices of silver per ounce troy.

—	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	Jun.	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
Jun.							
1	4.88½	42	92⅞	5	4.88½	42⅛	92¼
3	4.88½	42	92⅞	6	4.88½	42 3-16	92¼
4	4.88½	42 1-16	92	7	4.88½	42⅛	92⅛

Council Bills advanced ½d. on Wednesday.

The silver market has shown corresponding strength, and recovered from the sudden fall of last week, but it closes weaker at 42⅛. There still continues to be bi-metallic agitation in England, but no prospect of any immediate action.

United States Assay Office at New York reports total receipts of silver for the week 65,000 ounces.

Foreign Bank Statements.—The governors of the Bank of England at their weekly meeting made no change in the minimum rate for discount, which remains at 2½ per cent. During the week the bank lost £602,000 sterling bullion, and the proportion of its reserve to its liabilities was reduced from 42·50 to 40·77 per cent, against an advance from 39·83 to 41·21 per cent in the same week last year, when its rate for discount was 2½ per cent. Thursday the bank lost £70 000. The weekly statement of the Bank of France shows a gain of 40,338,000 francs gold and a loss of 2,725,000 francs silver.

Domestic and Foreign Coin.

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

	Bid.	Asked.
Trade dollars	$ .73	$ —
Mexican dollars	.73¼	.73¾
Peruvian soles and Chilian pesos	.72½	.73½
English silver	4.85	4.89
Five francs	.94	.95
Victoria sovereigns	4.87	4.89
Twenty francs	3.90	3.93
Twenty marks	4.75	4.80
Spanish doubloons	15.60	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 deliveries of lake copper continue at a satisfactory rate, and nothing can be bought in the open market in lake brands.

In contrast with this we have to report somewhat lower quotations for casting descriptions as the principal producers of these latter brands appear to be very anxious to secure all the orders they possibly can at about present quotations, and are competing very strenuously for them, the inevitable result being that prices have given way somewhat. Thus good casting copper has already been offered as low as 10¾, and even a trifle under that figure to consumers. This wide margin between the value of lake copper and casting copper will, no doubt, have the effect of stimulating the consumption of the inferior kinds, as it pays manufacturers to use the cheaper metal for many purposes when the difference in market value exceeds ¼@1c. per lb. The producers of Lake copper at the present are keeping their prices firmly up at 12c. per lb., but it remains to be proved whether the competition of the other producers will not necessitate some concession on their part. Under these circumstances it is quite natural that consumers of the metal evince little confidence in the stability of present quotations.

Reports received from Europe are of an entirely different nature, and it appears that consumption there is now very heavy, which is a clear proof that

the only thing wanted is low prices in order to greatly widen the field in which copper can be employed to advantage. The statistics of visible supplies for the month of May are very encouraging, the decrease for the first half being 1700 tons and for the second half 5300 tons, making the total decrease for the month 7000 tons, and manufacturers are reported as very independent, especially about booking orders for early delivery.

Although nothing authoritative is yet known about the reported settlement between the different parties interested in sustaining the market prices of Chili Bars and G. M. B.s in London, these have continued to rise slowly and steadily, and are reported by cable to-day at £42 cash and £41 15s. 3 months. Tough copper is quoted £45. Best selected £46. India sheets £49, with a large business all round.

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

To Liverpool—	Copper Matte.	Lbs.	
By S. S. City of Rome.....	1006 sacks	110,000	$5,300

Tin continues rather dull in this market and is being retailed in small quantities at about present cost of importing. Under these circumstances dealings in the open market have been rather limited and don't amount to a total of 100 tons for the entire week. We quote June, 20¾; July, 20 80; August, 20⅞.

Lead is still advancing and the demand for consumption is very large. Manufacturers of pipes and sheets as busy as they can possibly be, and the white lead manufacturers are also well booked with orders at remunerative prices.

The price of pig lead has now gone up to 4c. per pound, at which figure it was expected larger quantities would come on the market, but so far little is offered, and there are more buyers than sellers. From Chicago business is reported at 3·85 and from St. Louis at 3·80. these prices being about five points above the level of prices here after allowing for freight. At the moment the market has a very healthy appearance.

The London market is steady at £12 10s. for Spanish lead, and £12 15s. for English.

Chicago, Ill.—Messrs. Everett & Post telegraph to-day as follows: Market is strong and higher. In a limited way there are sellers at 3·90c., but most holders are asking 4c.; 3 85c. is freely bid, but nothing is available at that figure. Sales during the week amount to 500 tons.

St. Louis, Mo.—Messrs. John Wahl & Co. telegraph us to-day as follows: Market is strong and higher; sales were made in the early part of the week at 3·70c. Yesterday and to-day 1400 tons were sold at 3·75@3·80c. We quote desilverized at 3·85c.

Spelter is also firm and little can be obtained for prompt or early shipment; 4·95 to 5c. is now readily paid for prime Western brands. European prices remain very firm at £18 for ordinaries, and £18 2s. 6d. to £18 5s. for special brands.

Antimony is well sustained at the late advance, and slightly higher prices are again asked. We have to raise our prices to 14¾@15 for Cooksons and 13⅝@13¾ for Halletts.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 7, 1889.

The iron market throughout the country appears to have reached bottom in price, and in some cases a firmer tone seems to forecast higher prices. There will necessarily be a considerable increase in the demand for structural iron and steel for the new bridges and buildings required to replace those destroyed in the recent floods, but the mills are quite able to supply this demand as rapidly as required, so that we can see no ground for expecting any material increase in prices.

The cost of ore, coal and transportation are the elements that chiefly affect the price of crude iron, and the tendency has been rather towards lower freight rates and there is no indication of higher prices for coal and ore. We do not anticipate any great advance in pig iron, though, as already many times pointed out, some advance may be expected with the better demand looked for a month or two hence.

Pig Iron.—A steadier feeling is generally observable. Not quite as much Southern iron has been sold this week as last, but still there has been enough business stirring to sustain the improved tone noted last week. Northern iron is also moving a little more freely, and the opinion that prices have not only touched bottom, but are on the upward grade, finds more supporters than usual. The Thomas Iron company gives us quotations of $17 for No. 1 and $16 for No. 2. The range of values for Northern iron may be written as follows: No. 1 Foundry, $16.50@$17, No. 2, $15.50@$16, and $14.50@$15 for Gray Forge. Southern iron may fairly be quoted fifty cents per ton below these figures.

The Tennessee Coal, Iron and Railroad Company has made the following announcement, dated Nashville, Tenn., June 1st: "We beg to advise you that we have arranged with Messrs. Naylor & Co., New York, to sell the pig iron manufactured by this company in New England, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and the cities of Wheeling, W. Va.; Louisville, Ky.; Jeffersonville, New Albany, Fort Wayne, and Lafayette, Ind., and Chicago, Hegewisch, and Pullman, Ill.; and we shall be glad if you will address all inquiries after this date to them or their houses in Philadelphia and Pittsburg." Messrs. Naylor & Co. are now ready to receive all such orders.

Scotch Pig.—Importations are now confined to small lots coming as ballast or under a nominal freight to satisfy the requirements of those who have an irremovable predilection for the imported article. American Scotch, on the other hand, is growing in favor and now seems to hold its own on account of quality as well as cost.

Messrs. S. W. Royce & Co., of Manchester, write us on the 25th ult. that the demand for pig-iron at both Glasgow and Middlesbro' has latterly eased somewhat, and prices are some 6d. to 9d. per ton lower than at the commencement of the current month. Makers, however, have for the present very little iron for sale, and the fall in values is caused by those who having bought iron speculatively are now, with the slackening of demand, wishful to realize. The total shipments of pig-iron for the month of April, 1889, are, according to the Board of Trade returns, 110,247 tons of the value of £242,185, as against 101,272 tons, value £211,528, during the corresponding month of last year. Shipments from Middlesbro' are returned as 58,303 tons up to the 20th inst., the weight in last month up to same date being 74,574 tons.

Spiegeleisen.—The usual business has been transacted by those houses engaged in filling contracts, but in the way of new orders there is nothing to report. We continue to quote $28 for twenty per cent. Ferromanganese has been sold in a small way at $57@$58.

Structural Material.—The wide-spread devastations of the floods in Pennsylvania and in portions of Maryland and Virginia, and the destruction of bridges and trestles in great numbers, will, of course, create a large demand for structural materials of all kinds. The Cambria Works before the Johnstown disaster were turning out a large product of beams and bars, and their stoppage will contribute to increased activity among other mills working in this line.

Locally, no new contracts of importance have been placed during the week. Prices are firm and unchanged.

Merchant Steel is rather firmer, without any quotable change in prices. As the Cambria works produced and marketed some 50,000 tons of merchant steel annually, their withdrawal from the market, temporarily at least, will have a strengthening effect upon prices.

Wire Rods.—In consequence of a stiffening of prices on the other side, holders are now asking $43 per ton for wire rods.

Steel Rails.—Apart from small sales, ranging from two to five thousand tons each, the only transactions that are reported this week are those of the Lackawanna Coal and Iron Company, which, according to President Clark, will aggregate 19,000 tons. The feeling is certainly more confident and the quotation of $27 at Eastern mills now seems to be generally adhered to. We hear of no offerings by Western mills at less than $28. The destruction of the Cambria Iron Works, although it strengthens the position of sellers to a certain extent, will hardly have much effect on the market. We understand that for some time past, on account of the low prices current, the Cambria Works has devoted little attention to its steel rail production, and therefore the amount of orders on the books of the company will not aggregate much over 40,000 tons. According to Vice-President Stackhouse, the damage to the works is not so great as was anticipated, and it is said by the superintendent of the works, will not exceed $500,000, and the company may soon be able to resume deliveries upon its contracts. If it should be obliged to distribute any of its work, it is fair to presume that it would be given to conveniently situated Western mills, such as the Allegheny Bessemer Steel Company, at Duquesne; the Homestead Steel works, at Pittsburg, and the Pennsylvania Steel Company, at Steelton. At all events, there are plenty of rails to go around and to spare.

Scrap Iron.—We learn of a sale of 600 tons No. 1 wrought scrap at private figures. We continue our former quotations, but it must be stated that they are merely asking prices, and are probably a little higher than the figures that would be used as a basis for sales, were there any business to test values.

Concerning other articles, there have been no changes in prices or in the condition of the market.

CLEVELAND. June 6.

[From our Special Correspondent.]

The ore market during the past week has been dull and inactive, though with no further weakening tendencies. The "Aurora" mine has sold its ore at $5 a ton, a drop of twenty-five cents. The Ashland still holds out for 5.25 and has as yet made no definite contracts though they claim to have placed 75,000 tons, which will be definitely closed out in writing as soon as all are satisfied; there is no further likelihood of a drop.

These two ores are representative of the best grades mined in the Gogebic district. They are soft blue hematites, averaging 63 to 64 in iron and ·035 to ·045 in phosphorus. The principal owners of the Ashland & Colby are Milwaukee and New York capitalists, who evidently have faith in the future demand for high-grade Bessemer ores, as they show as yet no sign of weakening in the price wanted for both grades. The scarcity of lake tonnage is a factor which, if it continues, will make a further drop in the ore market an impossibility.

Though rates are still 90c. from Escanaba, $1.10 from Marquette, and $1.25 from Ashland and Two Harbors, yet it is almost impossible to get the boats.

LOUISVILLE. June 3,

[Special Report by Messrs. HALL BROTHERS & Co.]

The same variations exist between the views of the different furnaces as were noted last week. Some of the leading companies refuse to sell on the present market while the canvass of the past week disclosed sales by other companies at the lowest prices probably history has ever recorded. This is apparently with the furnaces that are forced to sell. It is thought that the market can hardly remain so depressed much longer, and that after anxious sellers have their order books fairly well filled, the situation may improve. Quotations will be found in our weekly register of prices.

PHILADELPHIA. June 7.

[From our Special Correspondent.]

During the past six days very little business of importance has been done in the pig iron market, although inquiries are numerous. Trade talk in this market is to the effect that prices will harden in consequence of the repairs that will be necessary in consequence of the damage done by the flood. Your correspondent can see no commercial reason for such an improvement to occur. Communication with the various iron centres throughout the State is broken so that it is impossible to ascertain fully what the loss amounts to. Pig-iron makers are giving last week's quotations but refuse to allow the concessions of last week.

Several small bloomeries will be compelled to suspend production on account of the flood's damages. Prices on all kinds of blooms have stiffened. Bar iron prices have also been unsettled, and agents are asking a tenth more, though customers could probably place a large order at old prices. Inquiries are numerous, but it is not known whether they mean business or are merely "feelers." The muck bar market has improved. Fifty cents on good quality bar this week. Makers are not desirous to book orders for forward delivery even at this price. Plate and tank mills are quoting last week's card with a tenth added for early deliveries. The belief is entertained that a farther advance can be made because the mills are quite full now, and small orders are coming in every day. It is said that an advance in structural iron will undoubtedly take place when orders are placed for the large amounts of material necessary to replace the bridges washed away. The mills are now pretty well provided with work. Quotations have not yet been formally advanced. The wrought iron pipe makers are well supplied with work. Discounts remain unchanged. The nail market is not as steady as six days ago. Prices are irregular. It is not probable that orders would be booked at the prices ruling for several months past. The sheet iron mills continue to book orders at card rates.

It is stated on good authority that $27 is the lowest figure in this market for steel rails. The business for the past week has been of small proportions. Merchant steel is active at firm prices. Old rails are dull. Very little scrap has been sold.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, June 7.

Heavy Chemicals—This market is somewhat steadier, without any improvement in the prices or in the situation. During the week there have been no very important transactions, and in the absence of any fresh business to test values, we allow our quotations to stand as before. Most of the business is of a jobbing character. We present very complete foreign correspondence this week. The concurrent opinion of our correspondents shows that the situation abroad is still unsettled.

Caustic soda, high test, is quoted this week at 2·C8c. by the American producers and 2·15c. by importers.

Bleaching powder is held at 1·60c. on the spot, but it is understood that futures can be obtained at 1·50c. Small lots on the spot are quoted up to 1·87½c.

Some business has been done in carbonated soda ash, 48 per cent, in carload lots, or in quantities just large enough to carry the glass makers through to the end of their fires. We quote 1 20@1·25c. in a large way. Caustic soda ash, 48 per cent, is rather firmer on account of a diminution of the spot supply. We understand that there is about 50 tons in store. Small lots are quoted at 1·30c. and larger quantities at 1·20@1·25c.

Refined alkali is moving more freely at 1·22½@1·25c. for 48 per cent and 1·12½@1·17½c. for 58 per cent.

We have just received the statement of the Bureau of Statistics for April, corrected to May 25th, from which we have prepared the following:

	April, '889. Lbs.	April, 1888. Lbs.
Bleaching powder	5.963,303	7,101,220
Caustic soda	5,801,838	6,476,999
Soda, ash, and sal soda	28,098,700	26,718,966
Potash, muriate	4,775,509	3,559,709
" nitrate	1,626,187	2,127,010
Soda, nitrate	12,274,022	22,999,718
Brimstone	7,519	14,406
Salt	44,208,789	41,197,301

Acids.—No new features of interest have developed in this market this week. Acetic acid is moving in a small way at 2c. per lb.; muriatic is a trifle firmer, but quotably unchanged. Nitric is rather quiet and sulphuric is still in good demand. Stocks in the hands of manufacturers are not greatly in excess of requirements nor is there any scarcity. The legitimate consumption seems to be sufficient to create a feeling of steadiness and to prevent accumulation of stocks. The syndicate price for oxalic acid is as yet unchanged and we hear of little business in the article. Our quotations in detail will be found in our register of current prices. The Highlands Chemical Company

reports that it will have its sulphuric acid plant completed in about a fortnight.

Fertilizing Chemicals.—There has been something of a depreciation in values in fertilizing materials this week on account of the continued dullness, particularly in ammoniacal articles. Some encouragement, however, is afforded by the fact that already a number of inquiries for next fall's supply have been received. A fair range of quotations is about as follows: Azotine, $2.40; dried blood (city), low grade, $2.35@$2 40 per unit; Western high grade, $2.40@$2.45 per unit for ground material; tankage, high grade, $25@$26 per ton; low grade, $23@$24 per ton, as to quality. Fish scrap, $25 per ton, f.o.b. factory. Sulphate of ammonia, $3.12½@$3.15 per cwt.

Refuse bone-black, guaranteed 70 per cent phosphate, $19@$20 per ton. Dissolved bone-black is 95c.@$1 per unit for available phosphoric acid, and acid phosphate 80c. per unit for available phosphoric acid.

Steamed bones, unground, $20@$24; ground, $24@$25.

Charleston rock, undried, $5 50 per ton; kiln dried, $6 50 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, $10.50@$11, ex steamer at New York.

Our special correspondent at Charleston, S. C., reports that during the month of May the total shipments from that port were 12,647 tons of crude. Of this amount New York received none; Baltimore, 1690 tons; Newtown Creek, N. J., 1214 tons; Weymouth, Mass., 2315 tons; Barren Island, 727 tons; Philadelphia, 800 tons; Wilmington, Del., 1000 tons; New Castle, Del., 585 tons; Wilmington, N. C., 245 tons, and the remainder was delivered to the C. & S. R R. The shipments during May were nearly 50 per cent less than during the corresponding period in 1888. No ground rock was shipped.

The following concerning Canadian phosphate rock will alsobe of interest: Since the opening of navigation in April there has been shipped from Montreal to Europe some 1252 tons of the phosphate rock, of which 350 tons were shipped by the Anglo Canadian Phosphate Company, and the remainder by Lomer, Rohr & Co. This is to May 15, and at that time several other vessels were loading.

Muriate of Potash.—Arrivals of 250 tons, the great part of which was for delivery on contract, are reported. We continue to quote the official price of $1.80 for both spot and futures.

Double manure salts.—Basis 48 per cent. potash continues at 1·20c. spot and 1·15c. to arrive. High grade sulphate of potash, or as some dealers now prefer to call it, high grade manure salt, is quoted at 2 38c. on a basis of 90 per cent potash.

Kainit.—The only available supply on the spot consists of about 50 tons in store, for which $11 per ton is asked. This is the remnant of the last shipment made some months ago. No arrivals are expected, according to the agent of the syndicate, until about July 1st, and on the same authority so much of this has been sold to arrive that small lots from that cargo can not be bought for less than $10.25@$10.50. The official price for future shipment, however, remains at $9.75 per ton.

Brimstone is unchanged. For best unmixed seconds on the spot $20 is asked, while $19.50 continues as the quotation for thirds.

Nitrate of soda is still in a rather demoralized state. We get the quotation of 2@2·05c. for the supply on the spot. In some quarters a more confident feel ng is discernible, but as yet we have failed to learn of any new features in the situation which would justify expectations more sanguine than those now entertained. The outlook in the European market has not brightened, supplies at primary points are still in excess of requirements, and trade at American ports has shown no material improvement. The reason for the present condition is considered by no one as inexplicable. It is the natural result of excessive supply. According to the statistics issued on the 1st inst. by Messrs. T. F. Edmands & Co., of Boston, the statistical situation is as follows:

	1887. Bags.	1888. Bags.	1889. Bags.
Stock U. K. and Continent, January 1st	720,000	487,000	583,000
Stocks United States, January 1st	67,000	70,000	91,000
Total stocks, January 1st	787,000	557,000	674,000
Exports to U. K. and Continent since January 1st	1,087,000	1,477,000	2,059,000
Exports to the United States since January 1st	262,000	262,000	259,000
Total exports since January 1st	1,349,000	1,739,000	2,318,000
Loading S. A. for U. K. and Continent, June 1st	225,000	187,000	450,000
Loading S. A. for United States, June 1st	67,000	30,000	45,000
Total loading, June 1st	292,000	217,000	495,000
Consumption U. K. and Continent since January 1st	2,115,000	2,973,000	3,022,000
Consumption United States since January 1st	162,000	171,000	212,000
Total deliveries for consumption since January 1st	2,277,000	3,144,000	3,234,000

Mr. F. B. Nichols reports that the deliveries during the fortnight ending June 1st aggregated 43,532 bags, against arrivals of 59,757 bags at Atlantic ports during the same period. This increases the spot supply to 83,744 bags on June 1st. Of this amount 65,744 bags are at New York. Mr Nichols says: "The consumption in Europe has been stimulated by low prices, which reveals the probability of a lower range of values for next agricultural season. It must be obvious to the producers that the present scale of production can only be maintained at a less cost to the planters. Shipments from the coast to all parts, 319,000 tons against 219,000 tons same time last year."

The question of the removal of the duty on high grade potash salts is still agitating the fertilizing chemical trade. On another page we print the views of well-known importers, who assert that in the event of the removal of the duty the price will not be raised by the sales syndicate. In another issue we shall be prepared to present further information concerning this important subject.

The phosphate litigations which have agitated the State of South Carolina for the past ten years have at last been settled. As the progress of the big suits has from time to time been fully reported in the ENGINEERING AND MINING JOURNAL, it is now necessary to record only that the net result to the State of this seven or eight years' litigation is:

First, the acquirement by the State of the undisputed title to the Morgan Island marshes, embracing over 5000 acres of phosphate marsh lands.

Second, the establishment of the title of the State to the Chisolm's Island Creeks, containing also a valuable phosphate deposit.

Third, the payment into the State treasury as a net balance after defraying the expenses of all these cases of nearly $32,000.

It is believed that this decision will be generally beneficial to the industry. It will certainly encourage the companies that are now working on leases from the state and it will doubtless have a stimulating effect upon the market values.

Liverpool. May 29.

[Special report by Messrs. BRUNNER & Co.]

Chemicals.—We cannot report any improvement in chemicals, but, on the contrary, in some cases, values are again easier. Soda ash.—Caustic ash is still slow of sale, but for carbonate ash there is a fair inquiry, although not much actual business reported. We quote: Caustic ash, 48 per cent, 1/16@1 3/32d.; high test, 3/16@1 3/32d. Carbonate ash, 48 per cent, 1 3/32@1 1/16d.;

IMPORTS AND EXPORTS OF METALS AT NEW YORK MAY 25 TO JUNE 1, 1889, AND FROM JANUARY 1

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co		67
Hendricks Bros		28
Lamarche's Sons, H.	1	6
Naylor & Co	5	66
Total	6	139
Corres. date, 1888		313

Nickel.	Lbs.	Lbs.
McCoy & Sanders		11,240
Total		11,240

Antimony.	Casks.	Casks.
Total	50	1,358
Corres. date, 1888	50	1,423

Pig Lead.	Lbs.	Lbs.
Casweil, E. A		10
Erie Dispatch		9
Foley, E		43
Henderson Bros		11
Hendricks Bros	11	67
Total	11	140
Corres. date, 1888	100	200

Tin.	Tons.	Tons.
Amer. Metal Co		402
Bidwell & French		351
Bruce & Cook		14
Carter, Hawley & Co		46
Cohn & Co., H	1	12
Crooks & Co		172
Daval & Son, John		21
Hendricks Bros		128
Knauth, N. & Kuhne		10
Lehmarer, S. & Co.	14	78
Mendel & Tompkins		1
Muller, Schall & Co		917
Naumann, F		1
Naylor & Co		1,166
Phelps, Dodge & Co		1,597
Pope, J. E., Jr	23	225
Schmarer & Co		11
Thomsen, A. A		151
Thomsen, D	15	146
Townsend, J. R		122
Wheeler & Co		1
Total	53	5,608
Corres. date, 1888		3,914

Tin Plates.	Boxes.	Boxes.
American MetalCo		44
American Metre Co	44	343
Brown & Co., V. H		350
Bruce & Cook		48,182
Byrne & Co., J		8,392
Central Stamp. Co	846	44,277
Coddington & Co	3,848	80,534
Cohen, S. M		272
Cohn & Co., H	237	7,322
Con. Fruit Jar Co		780
Cort & Co., N. L	11,226	65,593
Corbier, F. & S	351	1,806
Crooks & Co	959	48,292
De Mitt & Co	3,151	19,500
Dickerson, V. D	2,987	160,739
Downing & Co		231
Erie Dispatch		222
Foley, E		39
G. L. N	3	75
Holder & Herrick		271
Iron Clad M. Co		283
Ismay, J. B		500
Lalance & G	3	6,155
Lazard Bros		2,356
Lombard, Ayres		3,000
Merchant & Co	941	8,221
Mersick & Co	866	5,641
Morewood & Co		7,030
Mulholland & H		767
Newell Bros		150
Payne & Son		208
Phelps, Dodge & Co	12,169	236,672
Pratt Mfg. Co		104,973
Sanders Bros		479
Shepherd & Co		14,985
Scmers Bros	478	1,048
Taylor Co., N. & G		322
Thomsen, A. A	125	102,491
Warren & Co., J. M		3,434
Wheeler & Co	1,472	10,390
Whittemore & Co	3,457	18,013
Wolff & Reesing		2,532
Total	43,166	1,037,991
Corres. date, 1888		629,245

Pig Iron.	Tons.	Tons.
Bartlett, N. S		500
Crocker Bros	466	3,386
Crooks & Co		500
Henderson Bros		166
Godwin & Son, A. G		390
Irvin & Co., R		100
Martin, W. T		150
Naylor & Co		50
Page, Newall & Co		60
Perry & Ryer		125
Pierson & Co		500
Pope, J. E., Jr		250
Sheldon & Co., G. W		200
Stetson & Co	400	3,200
Walbaum & Co	25	275
Williamson & Co	75	1,500
Total	966	11,202
Corres. date, 1888	351	2,797

Steel Sheets, Billets, Forging, etc.	Tons.	Tons.
Abbott & Co		2,450
Ames, W. T		253
Baldwin Bros. & Co		15
Belcher, H. W		95
Boker, C. F		131
Carey & Moen		118
Carter, G. F		200
Coddington & Co		21
Crenshaw, Hugh		27
Crooks & Co		292
Curtis, R. J		408
Curran, J		5
Dana & Co	1,135	10,605
Downing & Co		171
Erie Despatch		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		1,557
Montgomery & Co		5
Naylor & Co	266	2,710
Newton & S		35
Oelrich & Co		389
Pierson & Co		323
Pilditch, F. S		75
Power, C. W		36
Prosser, Thos		496
Roebling's Sons		112
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		95
Wolff, R. H		347
Total	1,401	22,826
Corres. date, 1888		4,342

Bar Iron.	Tons.	Tons.
Abbott & Co., J		850
Bacon & Co	220	307
Downing & Co	276	519
Jacobus, E. G		17
Milne & Co	271	360
Muller, Schall & Co.	565	575
Naylor & Co	136	188
Ogden & W		7
Page, N. & Co	732	886
Plenty, John		2
Tromont, F		440
Wells, F., & Co		15
Total	2,200	4,069
Corres. date, 1888	80	1,998

Steel and Iron Rods.	Tons.	Tons.
Abbott & Co., J.	467	1,718
American S. Co	101	651
Bacon & Co	206	256
Boker, H	17	20
Bruce & Cook	12	20
Carey & Moen	1	431
Cooper, H. & Co		40
Crabb & Co., W		17
Dana & Co		1,915
Downing & Co		690
Fuller, D. & T	4	15
Galpin, S. H	644	1,045
Hazard Mfg. Co		20
Heyn, A		1,154
Lilienberg, N		56
Lundberg, G		56
Lundell, C. G	196	246
Milne & Co	281	592
Montgomery & Co	20	36
Muller, Schall & C.	126	328
Naylor & Co	943	8,894
Nichols, B. J		10
Page, N. & Co	250	524
Pratt Mfg. Co		30
Roebling's Son	300	1,069
Wheeler & Co., E. S		120
Whitney & Co	510	580
Williams & W		5
Wolf & Co		2,455
Wright P. & Co		3
Total	4,078	23,756
Corres. date, 1888	547	23,538

Old Rails.	Tons.	Tons.
Baldwin Bros. & Co		240
Bowring & A		57
Crossman & Bro		1,298
Henderson Bros		150
Neumark & Gross.	2,929	6,115
Perkins, C. L		433
Perry & Ryer		177
Sheldon & Co		203
Ward & Co., J. E		21
Total	2,929	8,664
Corres. date, 1888		5,602

Scrap Iron.	Tons.	Tons.
Burgass & Co		162
Downing & Co		321
Funch, E. & Co		397
Neumark & Gross.	500	500
Spaulding & Co		172
Ward & Co., J. E	160	429
Watjen, F. & Co		152
Total	660	2,133
Corres. date, 1888	70	2,102

Sheet Zinc.	Lbs.	Lbs.
Crooks & Co		441,814
Lemarch's S's, H		1,554
Total		443,368

Sheet Iron.	Tons.	Tons.
Coddington & Co		456
Downing & Co		16
Kelly, Hugh		5
Total		477
Corres. date, 1888	30	626

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

Spiegeleisen.	Tons.	Tons.
Abbott & Co	820	1,571
Blakely & McLellan	999	3,100
Crocker Bros		7,222
Dana & Co	370	4,876
Farris & Co		325
Geisenheimer & Co		85
Jansen, J. A	960	9,070
Naylor & Co	541	8,730
Perkins, C. L		1,401
Walbaum Bros		675
Total	3,690	37,458
Corres. date, 1888	1,230	19,168

Iron Ore.	Tons.	Tons.
Earnshaw, A		4,971
Total		4,971
Corres. date, 1888	1,935	12,125

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co		463,109
Amer. Metal Co		697,250
Hurst, F. W. J		113,000
Naylor & Co	37,476	1,234,500
Orford, C. & S Co		112,013
Piper, D. & Co		3,898
Seaman, Sam'l H		141,800
Total	37,476	2,765,570
Corres. date, 1888		18,076,885

Copper Matte.		
Abbott & Co		427,613
Amer. Metal Co		3,101,170
Am. & Paterson	54,280	198,500
Clark, W. A		879,019
Henriott, F		5,083,269
Seaman, Sam'l H		13,000
Wil'ms, Terhune		692,494
Total	54,280	10,385,063
Corres. date, 1888		22,375,111

Old Copper.		
Burgass & Co		32,45
R. J. Cortis		34,10
Total	34,100	66,5
Corres. date, 1888		181,5

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS.

Acid—Acetic, ℘ 100 lbs	2.00
Muriatic, 18°, ℘ 100 lbs	1.10@1.20
Muriatic, 20°, ℘ 100 lbs	1.35@1.50
Nitric, 36°, ℘ 100 lbs	4.00@5.50
Nitric, 42°, ℘ 100 lbs	5.50@7.00
Oxalic, ℘ 100 lbs	.9.50@10.50
Sulphuric, 60°, ℘ 100 lbs	90@95
Sulphuric, 66°, ℘ 100 lbs	95@1.25
Alkali—36 p. c	1.20 @1.25
Refined, 48 p. c	1.22½@1.25
Refined, 58°	1.15@1.20
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.	3.12½@3.15
Carb, per lb	7½@8½
Muriate per lb	6⅛@8
Arsenic—White, powdered, ℘ lb	3@3½
Red ℘ lb	7@8
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	16@20
Sulph., foreign, floated, p. ton	20@21
Sulph., off color, p. ton	13.00
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	1·60
Borax—℘ lb	9¼
Refined at Liverpool, ℘ ton	£29
Brimstone—*See Sulphur.*	
Bromine—℘ lb	37@38
Chalk—℘ ton	3.25@3.50
Precipitated, ℘ lb.	4¾@5
China Clay—English, ℘ ton	13.50@18.50
Southern, ℘ ton	13.50
Chrome Yellow—℘ lb	10@25
Cobalt—Oxide, ℘ lb	2·60@2·90
Copper—Sulph. English Wks., ton	£24
Precip., Eng Wks, unit	fluctuating
Copperas—Common, ℘ 100 lbs	.52@57½
Best, ℘ 100 lbs	.75@1.00
Liverpool, ℘ ton, in casks	£1 15s.
Cream of Tartar—Am. 99%	24@24¾
Powdered, 99 p c	24¾@25½
Emery—Grain, ℘ lb	4½@5
Flour, ℘ lb	2¾@3½
Feldspar—Ground, ℘ ton	15.00
Fuller's Earth—Lump, ℘ bbl.	.90@95
Powdered, ℘ lb	1⅞@2
Gypsum—Calcined, ℘ bbl.	1.25
Iodine—Resublimed	3.50
* **Kainit**—℘ ton	9.75@11.00
Kaolin—*See China Clay.*	
Lead—Red, ℘ lb.	6¾@7
White, American, in oil, ℘ lb	6¾@7¼
White, English, ℘ lb	8½@8¾
Acetate, or sugar of	12@13
Lime Acetate—Amer. Brown.	.95@1.00
" Gray	1.75@1.87½
Litharge—Powdered, ℘ lb.	.6½@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	64@66
Mineral Wool —℘ lb.	2
Mica—In sheets according to size, 1st quality, ℘ lb	25@$6 00
Phosphate Rock—S. Carolina, per ton f. o. b Charleston	5.25@6.00
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.	13¾@15¼
Carb. ℘ lb	4.70@5.50
Caustic, ℘ lb	7½@8
Iodide	.2.70@2.75
Muriate, ℘ 100 lbs	1.80
Nitrate, refined, ℘ lb	6@8
Bichromate, ℘ lb	11½@12
Sulphate, ℘ 100 lbs	2.30@2 35
Yellow Prussiate, ℘ lb	17½@18
Red Prussiate, ℘ lb	4½@45
Pumice Stone—Select lumps, lb.	3¼
Original cks., ℘ lb	1¾
Powdered, pure, ℘ lb	2¼@2½
Pyrites—Non-cupreous, p. unit, s.	10d.
Quartz—Ground, ℘ ton.	16.00
Rotten Stone—Powdered, ℘ lb.	3¼@3½
Lump, ℘ lb	6@10
Eng., powdered, ℘ ton	£4
Lump, ℘ ton	£5
Salt—Liverpool, ground ℘ sack	75@80
Turk's Island, ℘ bush	25@27
Salt Cake—℘ lb	50@57
Saltpeter—Crude, ℘ lb.	5@5⅛
Refined, ℘ lb.	6@8
Soda Ash—Carb., 48% 100 lb	1.22½@1.30
High test	1.12½@1.15
Caustic, 48 %	1.23¼
Soda Caustic, 60%	2 40
" " 70%	2.10 @2.15
" " 74-6%	2.10 @2.15
Sal, English, ℘ 100 lbs	.90 @1.00
Sal, American, ℘ 100 lbs	.80
Nitrate ℘ 100 lbs	2.05
Strontium—Nitrate ℘ lb.	9@9½
Sulphur—Roll, ℘ lb	1¾
Flour, ℘ lb	2
Crude Brimstone, 2s., ℘ ton	19.50@20.00
Crude Brimstone, 3ds, ℘ ton.	19 00
Talc—Ground French, ℘ lb	1¼@1½
Domestic, ℘ lb	1@1¼
c. i. f. Liverpool, ℘ ton	£4 5 0
Vermillion—American, ℘ lb	61
English, ℘ lb	82@85
Vitriol—(Blue), Ordinary, ℘ lb	5¾@6⅜
Extra, ℘ lb	7
Zinc Oxide—Am., Dry, ℘ lb.	4½
Antwerp, Red Seal, ℘ lb	6@6½
Paris, Red Seal, ℘ lb.	6½@7

* Spot

BUILDING MATERIAL.

Bricks—Pale, ℘ 1,000	3 00@3.25
Jerseys, ℘ 1,000	4.50
Up Rivers, ℘ 1000	4.50@5 00
Haverstraw seconds, ℘ 1000	5 00@5.50
Haverstraw firsts ℘ 1,000	5.50@6.00
Fronts, nominal, ℘ 1000.	
Croton	14.00@16.00
Wilmington	20.00@21.00
Philadelphia	@28.00
Trenton	@28.00
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	.90@1.10
Portland, American, ℘ bbl	2 15@2.45
Portland, foreign, ℘ bbl	2.40
Portland, " special brands	2.45@3.75
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	
Red roofing, ℘ 100 sq. ft.	10.00@15.00
Black, roofing, ℘ 100 sq. ft.	4.50@5.25
Lime—Rockland, common ℘ bbl	1.00
Rockland, finishing, ℘ bbl	1.20
St. John, com. and finish, ℘ bbl.	.90
Glens Falls, com. and fin., ℘ bbl	.80@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

THE RARER METALS.

Aluminum—(Metallic), ℘ lb.	$8.50@$10
Arsenic—Metallic, per lb	20
Barium—(Metallic), per lb	975.00
Bismuth—(Metallic), per lb	2.40
Cadmium—(Metallic), per lb	1.25
Calcium—(Metallic), per oz	150.00
Cerium—(Metallic) per oz	160.00
Chromium—(Metallic), per lb	200 00
Cobalt—(Metallic), per lb	6.00
Didymium—(Metallic), per oz	160.00
Erbium—(Metallic), per oz	140.00
Gallium—(Metallic), per oz	3250.00
Glucinum—(Metallic) per oz	250.00
Indium—(Metallic), per oz	158.00
Iridium—(Metallic), per lb	650.00
Lanthanum—(Metallic), per oz	175.00
Lithium—(Metallic), per oz	160.00
Magnesium—Per lb	4.50
Manganese—Metallic, per lb	1.10
Chem. pure, per oz.	10 00
Molybdenum—(Metallic), per oz.	6.00
Niobium—(Metallic), per oz	128.00
Osmium—(Metallic), per lb	640.00
Palladium—(Metallic), per lb	400.00
Platinum—(Metallic), per lb	140.00
Potassium—Metallic, per lb	28.00
Rhodium—(Metallic), per lb	512.00
Ruthenium—(Metallic), per oz	112.00
Rubidium—(Metallic), per oz	200.00
Selenium—(Metallic), per oz	3.00
Sodium—(Metallic) per lb.	2.75
Strontium—(Metallic), per oz	128 00
Tantalium—(Metallic) per oz	144.00
Telurium—(Metallic) per oz	9 00
Thallium—(Metallic) per oz	3.00
Titanium—(Metallic) per oz	32.00
Thorium—(Metallic) per oz	272.00
Tungsten—(Metallic) per oz	4.00
Vanadium—(Metallic), per oz	320.00
Yttrium—(Metallic), per oz	144.00
Zirconium—(Metallic), per oz	240.00

METALS.

Aluminum—	
94-96% pure, ℘ lb	$5
Over 96% pure, ℘ lb	6
Copper—	
Lake Ingot, Spot, ℘ lb	12c.
Electrolytic, ℘ lb	10·90c.
Casting Brands, ℘ lb.	....
Chili Bars, London, ℘ ton	£41
Sheet Copper (according to size), ℘ lb	25@30c.
G. M. B	£41
Nickel.—	
Metallic, per lb	60c.
Lead—	
Domestic, Common, Spot	4·05c.
Foreign	4 90c.
Sheet, ℘ lb	6¾c.
Pipe, ℘ lb	6c.
Tin lined Pipe, ℘ lb	15c.
Shot, ℘ 25-lb. bag	1·16c.
Spanish Lead, London	£12 12s. 6d.
Tin—	
Tin Plates	13s. 6d.
Tin Spot in London	£91 12s. 6d.
Pig tin, spot in N. Y., ℘ lb	20·45c.
Zinc—	
Domestic spelter, ℘ lb	4·95c.
Foreign spelter, ℘ lb	5·80c.
Silesian, ton	£17 15s
Sheet, American, ℘ lb	6¼c.
Antimony—Hallet's, per lb	13½c.
Cookson's, per lb	14½c.
Star Antimony	£56 10s.
Quicksilver—Per lb	57@58c.
London, ℘ flask	£8 5s @ £8 10s.

IRON AND STEEL.

New York Prices.

American Pig-Iron.—At tidewater.	
No. 1 X	$16.50@$17 00
No. 2 X	15.50@ 16.00
Forge.	14.50@$15.50
Scotch Pig—Coltness	$21.50@$21.75
Clyde	....
Dalmellington	19.50@ 20.00
Summerlee	21.25@ 21 50
Shotts	20.50@ 21.00
Langloan	20.50@ 21.00
By Cable to-day to the Metal Exchange :	
Scotch Warrants	42s. 9d.
Coltness, at Glasgow	54s. 3d.
Langloan, at Glasgow	53s. 6d.
Summerlee, at Glasgow	54s.
Gartsherrie, at Glasgow	51s. 3d.
Glengarnock, at Ardrossan	51s. 6d.
Dalmellington, at Ardrossan	45s.
Eglinton, at Ardrossan	43s. 6d.
Bessemer Pig—	
Foreign, nominally	20.50@ 21.00
Domestic "	16 50@ 17.50
Spiegeleisen—	
German, 20 per cent	27.50@ 28.00
English, 20 " "	28.00@ 28.50
" 30 " "	33 00@ 34.00
Ferro Manganese, 80%	57.00@ 58.00
Steel Billets, "	30.00@ 33.00
Steel Nail Slabs, "	28.00@ 28 50
Steel Wire Rods, "	42.50@ 43.00
Steel Rails—	
Heavy sections, at mill	26.50@ 27.00
Light " "	30.00@ 32.00
Structural Iron and Steel—	
Bridge Plate, at mill	2·0c@2·1c.
Angles, at mill	1·90@2·00c.
Tees, at mill	2·40@2·50c.
Steel Angles, at mill	2·15@2·25c.
Beams and Channels, on wharf, 2·8c. base	
Steel Plates—	
Tank and Ship, on wharf	2·15@2·25
Shell, on wharf	2 35@2·4
Flange, "	2 55@2 75
Fire-Box, on wharf	3·25@4
Iron Plates—	
Common tank, on wharf	2·05@2·25c.
Refined, on wharf	2·3@2·4c.
Shell, "	2 4@2 5c.
Flange, "	3·4@3·5c.
Extra flange	3¾@4
Bar Iron—	
Refined	1·7@2·0c.
Common	1·60@1·7c.
Merchant Steel—	
American tool	7½@10c.
Special grades	13 @20c.
Crucible machinery	5 @6c
" spring	3¾@4¼c
Bessemer machinery	2·25@2·75c.
" spring	2·5@2·70c.
Cast-Iron Pipe—At works:	
According to size	$25 00@$31.00
Wrought Iron Pipe—nominal—	
Butt-Welded, Plain and Tarred, 55% disc; Galv., 45% disc.	
Lap-Welded, Plain and Tarred, 65% disc.; Galv., 55% disc.	
Boiler Tubes—Per cent disc	62½%
Rail Fastenings—	
Spikes	2c. deliv'd
Angle Fish-bars	1 85c.
Bolts and Sq Nuts	2·9 @3c.
" Hex "	3·1 @
Wrought Scrap—	
No. 1 Yard *to vessel*	20.50
Cast Scrap	15.50
Old Car Wheels	18.00
Old Rails—Tees	22.00
—Doubles	23 00
Nails—In car-load lots.	$1.80@ $2 00
—From store	1.85@ 2.00
Nails	$1.90 usual discount
Steel Nails	$1 90
Wire Nails	2.55

Two per cent off for cash. * At works.

Louisville Prices.

Hot Blast Irons—	
So. Coke, No. 1	$14.50@$15.00
" " No. 2	14 00@ 14 50
" " No. 3	13 00@ 13.50
Mahoning Valley (Lake Ore Mixture)	17.50@ 18.50
So. Charcoal, No. 1	16.50@ 17.00
" " No. 2	16.00@ 16.50
Missouri Charcoal No. 1	17.50@ 18.00
" " No. 2	17.00@ 17.50
Forge Irons—	
Neutral Coke	$13.00@$13.25
Cold Short	12.75@ 13.00
Mottled	12.00@ 12.25
Car Wheel and Malleable Irons—	
Southern (standard brands)	$21.50@$22.00
" (other brands)	17 50@ 18.00
Lake Superior	22.00@ 22 50

Pittsburg Prices.

Coke or Bituminous Pig—	
Foundry No. 1	$16 25@16.50
Foundry No. 2	15.25@....
Gray Forge No. 3	14.25@....
" " No. 4	13 75@14.00
White	13.75@14 00
Mottled	13.75@14.00
Silvery	16.00@18.50
Bessemer	15.75@16.00
Low Phos	20.50@.....
Charcoal Pig—	
Foundry No. 1	23.50@24.50
Foundry No. 2	22.00@23.50
Cold-Blast	25.00@28.00
Warm-Blast	24 00@25.00
10 + 12% Spiegel	27.50
20% Spiegel	30.00
Muck-Bar	26.25@26.50
Steel Blooms	......@28.00
Steel Slabs	26.75@27 00
Steel Crop Ends	18.00
Steel Bloom Ends	18.00
Ferro Manganese, 80%	58.00@......
Steel Billets	26.75@27.00
Old Iron Rails	22.00@22.25
Old Steel Rails	17.50@18.00
No. 1 W. Scrap	18.00@18.25
No. 2 W. Scrap	17 50@......
Steel Rails	27.50@28.00
" light sections	27.50@31.00
Bar Iron, nominal	1.65@ 1.70
Iron Nails	1.85@ 1.90
Steel Nails	1.85@ 1.90
Wire Nails	2.15@ 2.20

Philadelphia Prices.

Foundry No. 1	$17.00@18.00
Foundry No. 2	16.00@16.50
Gray Forge	14.50@15.25
Bessemer Pig	19.00@ ....
Foreign Bessemer	20.00@.....
Spiegeleisen	......@27.50
Scrap, Selected	22.00@......
No. 1	21.00@21.50
Cargo Scrap	20.00@21.00
Muck-Bars	......@27.00
Merchant Iron	1.60@ 1.80
Plate Iron	1.90@ 2.00
Tank Iron	2.00@ 2.10
Skelp Iron	1.70@ 1.85
Angles	1.95@......
Beams and Channels	2.80@......
Nails	1.60@ 1.90
Steel Rails	26.00@27.00
Old Rails	22.00@23.00

STOCK MARKET QUOTATIONS

Birmingham, Ala.

COMPANY.	Bid.	Asked.
Ala. R. Mill Co.	....	$60
Ala. Con. C. & C. Co.	....	$30
*Alice Furnace.	$102	...
Anna Howe G. Mg. Co.	$1¾	....
Bess. Land Co.	$22@$22½	$23@$23¼
Bir. Fur. & Mg.	....	$18
Bir. Mg. & M g.	....	$144
Broken Arrow.	$3	$5½
De Bardeleben C. & I. Co.	$50	$55
Decat. L. Imp.	$10½	$11@$11⅞
Decatur Min. L.	....	$25
Enterprise Mfg.	....	$50
*Eureka	$102	$108
Hen. S. & M. Co.	$80	$95@$105
Jagger Towley C. & C	....	$11@$11½
Mag-Ellen	$96	....
*Mary Pratt	$100	....
Sloss I. & S.	....	$42½
†Sloss I. & S.	....	$94
††Sloss I. & S.	$60	$65
Tuscaloose C., I. & L. Co	$20	....
Tenn. C. & I. Co.	$35@$37	$38@$39
*Williamson	$99¾	....
Woodstock I. Co	$54½@$55½	$60

Sales during the week ended June 4th.

Camille Gold	100 shs.	$⅞
Decatur	25 shs.	$11

* Bonds. † First mortgage. †† Second mortgage. ‡ Selling price.

Pittsburg, Pa.

COMPANY.	H.	L.	Closing
Bridgewater Gas Co	47.00	47 00	47.00
Chartiers Val. Gas.	51.00	49.50	51.00
La Noria Mining	1.75	1.25	1.50
Nat. Gas Co. of W. Va	68 00	66 00	61.00
Ohio Valley Gas	33.00	25.00	33.00
People's N. G. & P. Co.	17.50	16.88	17.50
Philadelphia Co.	37.63	37 00	37 00
Pine Run Gas	100.00	85.00	100.00
Silverton Mg. Co.	1 00	1 00	1.00
Washington Oil Co.	74.50	72.00	72 00
West & Cambria	40.00	40.00	40.00
W'house A B Co.	120.00	115.00	119 00
W'house B. Co. Lm.	64.00	64.00	64.00
W'house E. Light.	*56 00	*54.00	*54.00
Wheeling Gas	*32.00	*31.00	*32.00

Sales during the week ending June 5:

Chartiers Valley	100 shs.	$50
Philadelphia Co.	305 "	37⅛@ 37⅝

*Actual selling price.

Foreign Quotations.

London COMPANY.	Highest.	May 25. Lowest
Alturas Gold, Idaho	4s.	3s.
Arizona Copper, Ariz.	18s. 6d.	18s.
Callao Bis, Venz	3s. 6d.	3s.
Carlisle, N. Mex	3s. 6d.	3s.
Colorado United, Colo.	3s. 6d.	3s.
Columbian, S. A.	£2	£1¾
Comstock, Utah	£1¼	£1⅛
Cons. Esmeralda, Nev.	4s. 6d.	4s.
Denver Gold, Colo.	1s. 6d.	1s.
Dickens Custer, Idaho.	3s.	2s. 6d
Eberhardt, Nev	1s. 6d.	1s.
El Callao, Venezuela	£2½	£2
Elmore, Idaho	4s.	3s. 6d.
Empire, Mont	3s.	2s.
Flagstaff, Utah	1s. 3d.	9d
Garfield, Nev	6s. 6d.	5s. 6d.
Hambley Freehold, N.C.	£1⅛	£⅞
Ilex, Cal	£⅜	£⅛
Jay Hawk, Mont	5s. 6d.	4s. 6d.
Josephine, Cal	10s.	8s.
Kohinoor, Colo.	3s. 9d.	3s. 3d.
Mason & Barry, Port.	£6⅛	£6
Montana Lt., Mont	£1 15-16	£1 13-16
New California, Colo.	7s 9d.	7s. 3d.
New Consolidated	1s. 6d.	1s.
New Emma, S., Utah.	5s. 3d.	4 9d.
New Hoover Hill, N. C.	2s. 3d.	1s. 9d.
New La Plata, Colo.	1s. 6d.	1s
Old Lout, Colo	£1¼	£1
Pittsburg Cons., Nev.	16s. 3d.	13s. 9d.
Quebrada, Venezuela	£⅞	£⅝
Richmond Con., Nev.	£2¼	£1¾
Ruby & Dunderberg, Nev	1s. 3d.	9d
Russell Gold, N. C.	2s. 3d.	1 9d.
Sierra Buttes, Cal.	£¾	£⅝
Stanly, N. C	4s.	2s
United Mexican, Mex.	£3	£2¾
U. S. Placer, Colo.	2s.	1s 6d.
Viola Lt., Idaho	3s. 6d.	2s 6d.
*Paris.**		May 23
Belmez, Spain	540.00	540 00
Boleo, Mex	365 00	365.00
Callao Bis. Venez	5.50	5.50
East Oregon, Ore.	30.00	30 00
Forest Hill Divide, Cal	400.00	400.00
Golden River, Cal	390 00	390.00
" " parts	60.00	60 00
Lexington, Mont.	130.00	130.00
" parts	5.00	[illegible]
Ouray, Colo.	28.00	28.0
Rio Tinto, Spain	287.50	287.5
Tharsis, Spain	5.00	85,

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	*				775,000	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	325,000	July	1886	.10	40,000	Feb.	1880	.20
8	Aspen Mg. & S., s. l.	Colo.	2,000,000	200,000	10	*				280,000	May	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	300,000	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	550,000	Mar.	1889	.50	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	*				500,000	Apl.	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	105,000	Apr.	1889	.25	175,000	Jan.	1884	.10
20	Bunker Hill & Sull..	Idah.	3,000,000	300,000	10	*				150,000	Oct.	1883	.06⅔
21	Caledonia, g	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	104,000	Jun.	1889	.08
22	Calumet & Hecla, c	Mich	2,500,000	100,000	25	1,200,000				31,850,000	Feb.	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.	1883	.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	*				392,250	Jun.	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	2,980,800	Jun.	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	2,825,000	Oct.	1888	.50	11,588,000	Jan.	1875	2.00
36	Daly, s. l.	Utah	3,000,000	150,000	20					1,050,000	May	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	*				370,000	Apl.	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	525,000	Mar.	1889	.25	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	4,402,200	May	1889	.30	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	625,000	Mar.	1889	.30	[illegible]	Mar.	1884	.25
57	Granite, s. l.	Idah.	500,000	500,000	1	*				10,000	Jun.	1888	.02
58	Granite Mountain, s.	Mont	10,000,000	400,000	25					6,400,000	May	1889	.50
59	Green Mountain, g	Cal..	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
60	Hale & Norcross, g. s	Nev.	11,200,000	112,000	100	5,086,000	July	1887	.50	1,822,000	Aug.	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	*				197,970	July	1886	.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.	1883	.10
65	Homestake, g	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,393,250	May	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					5,15[illegible],650	May	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	1879	.25
74	Iron Hill, s.	Dak.	2,500,000	250,000	10	126,500	Jan.	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	.30	50,000	Oct.	1886	.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	351,000	Apl.	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.i.	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	Lookout, g	Dak.	1,000,000	500,000	2	*				60,000	May	1889	.02
87	Marion Bullion, g	N.C.	600,000							15,000	Jan.	1886	
88	Martin White, s.	Nev..	10,000,000	100,000	100	1,175,000	Jan.	1889	.25	140,000	Dec.	1886	.25
89	Mary Murphy, g. s.	Colo.	350,000	3,500	100	*				175,000	May	1888	5.00
90	Minnesota, c	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1.00	1,820,000	Mar.	1876	
91	Mono, g	Cal.	5,000,000	50,000	100	65,350	Mar.	1889	.25	12,500	Mar.	1886	.25
92	Montana, Lt., g. s.	Mont	3,300,000	660,000	5	*				2,190,285	Jan.	1889	.06¼
93	Morning Star, s. l.	Colo.	1,000,000	100,000	10					775,000	Mar.	1888	.25
94	Moulton, s. g	Mont	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
95	Mount Pleasant, g	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
96	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	140,000	Jan.	1889	.40
97	Napa, q	Cal..	700,000	100,000	7					310,000	July	1889	.10
98	Navajo, g. s.	Nev..	10,000,000	100,000	100	485,000	Apl.	1888	.30	365,000	Apl.	1889	.10
99	New Guston, s.	Colo.	500,000	100,000	5					100,000	Dec.	1888	.50
100	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06¼
101	Northern Belle, s.	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl	1883	.50
102	North Belle Isle, s.	Nev..	10,000,000	100,000	100	350,000	Jan	1889	.50	230,000	May	1888	.50
103	North Star, g	Cal..	1,000,000	100,000	10					150,000	Dec	1888	.50
104	Ontario, s. l.	Utah	15,000,000	150,000	100					10,100,000	May	1889	.50
105	Ophir, g. s.	Nev..	10,000,000	100,000	100	4,159,440	May	1889	.50	1,595,800	July	1882	1.00
106	Original, s. c.	Mont	1,500,000	60,000	25	*				123,000	July	1888	.05
107	Osceola, c	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,222,500	Mar.	1889	1.00
108	Oxford, g	N. S.	125,000	125,000	1	*				33,500	Oct.	1885	.02
109	Paradise Valley, g. s	Nev.	10,000,000	100,000	100	57,000	Apl.	1888	.15	150,000	Apl.	1887	.10
110	Parrot, c	Mont	1,800,000	180,000	10					372,000	May	1889	.10
111	Peacock, s. g. c.	N.M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
112	Plumas Eureka, g	Cal..	1,406,250	140,625	10					2,495,312	Apl	1889	.50
113	Plutus, g. s. c. l.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
114	Plymouth Con., g	Cal..	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
115	Quicksilver, pref., q.	Cal..	4,300,000	43,000	100					1,599,593	May	1889	1.50
116	" com., q.	Cal..	5,700,000	57,000	100					643,867	July	1882	.40
117	Quincy, c	Mich	1,000,000	40,000	25	200,000	Dec.	1862		5,170,000	Feb.	1889	5.00
118	Richmond, s. l.	Nev..	1,350,000	54,000	25	*				4,312,587	Jun	1887	1.25
119	Ridge, c	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	99,785	Feb.	1880	.50
120	Robinson Con., s. l.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
121	Robert E. Lee, s. l.	Colo	10,000,000	500,000	20					100,000	Dec.	1882	.50
122	Savage, s.	Nev..	11,200,000	112,000	100	6,486,000	Jan.	1889	.50	4,460,000	July	1869	3.00
123	Shoshone, g	Idah.	150,000	150,000	1					7,500	Apl.	1883	.01
124	Sierra Buttes, g	Cal..	2,225,000	122,500	10					1,568,1[illegible]	Apl.	1888	.12½
125	Sierra Nevada, g. s.	Nev..	10,000,000	100,000	100	6,175,000	Mar.	1889	.25	102,000	Jan.	1871	1.00
126	Sierra Nevada, s. l.	Idaho	1,000,000	¶	1	*				40,000	May	1889	.02
127	Silver Cord, g. s. l.	Colo.	5,000,000	500,000	10					275,000	Apl.	1889	.10
128	Silver King, s.	Ariz.	10,000,000	100,000	100	50,000	Jun.	1888	.50	1,950,000	July	1887	.25
129	Silver Mg. of L. V.	N. M.	500,000	500,000	1					25,000	June	1889	.05
130	Silverton, g. s. l.	Colo.	2,000,000	200,000	10	*				50,000	Nov.	1886	.02
131	Small Hopes Cons., s.	Colo.	5,000,000	250,000	20	*				3,137,500	Jun.	1889	.10
132	Smuggler, s. l.	Colo.	600,000	60,000	10					66,700	Aug.	1885	.25
133	Spring Valley, g	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan	1881	.25
134	Standard, g. s.	Cal..	10,000,000	100,000	100	25,000	Oct.	1884	.25	3,595,000	Jun.	1885	.05
135	Stormont, s	Utah	500,000	500,000	1	*				155,000	Nov	1881	.05
136	St. Joseph, l	Mo..	1,500,000	150,000	10	*				844,000	Dec.	1887	.20
137	Surinam, g	D. G.	3,000,000	600,000	5					105,000	Nov.	1887	.05
138	Swansea, g	Colo.	600,000	60,000	10	*				9,000	Apl.	1888	.02½
139	Syndicate, g	Cal..	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
140	Tamarack, c	Mich.	1,000,000	40,000	25	520,000	Apl.	1885	3.00	840,000	Apl.	1889	5.00
141	Tip Top, s	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov	1881	.20
142	Tombstone, g. s. l.	Ariz.	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
143	United Verde, c	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
144	Valencia, m	N. H.	150,000	1,500	100	*				37,500	Apl	1886	2.50
145	Viola Lt., s. l.	Idah.	750,000	150,000	5	*				272,500	Oct.	1888	.37½
146	Ward Cons., s. l.	Colo.	2,000,000	200,000	10					10,000	Apl.	1889	.05
147	Yankee Girl	Colo.	2,500,000	250,000	10					1,275,000	July	1887	.10
148	Yellow Jacket, g. s.	Nev..	12,000,000	120,000	100	5,50[illegible],000	Mar	1889	.50	2,184,000	Aug	1871	1.50
149	Webb City, l. z.	Mo..	55,000	11,000	5					2,200	Apl.	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	562,500	Nov	1888	.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	.50
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.	1883	.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	2,104,990	Jan.	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.	Idah.	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	1,428,000	Oct.	1888	.50
29	Cleveland, t	Dak.	1,000,000	500,000	2	*			
30	Colchis	N. M.	500,000	50,000	1				
31	Commonwealth, s.	Nev.	10,000,000	100,000	100	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	1,800,000	Nov.	1888	.05
34	Con. Pacific, g	Cal..	6,000,000	60,000	100	186,000	Fb.	1889	.15
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	115,000	Feb.	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	615,000	Apl.	1889	.25
54	Found Treasure, g.s.	Nev..	10,000,000	100,000	100	30,530	Apl	1889	12½
55	Gogebic I. Syn., i	Wis.	5,600,000	200,000	25				
56	Gold Cup, s.	Colo.	500,000	500,000	1	*			
57	Golden Era, s.	Mon.	2,000,000	200,000	10	*			
58	Gold Placer, g	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.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 Remance, 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..	1,000,00	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, s. s	Nev..	10,000,000	100,000	100	2,750,760	Mar	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'sh	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	180,000	Dec.	1888	.50
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	30,000	Oct.	1888	.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	100	*			
100	Oriental & Miller, s.	Nev..	10,000,000	400,000	25				
101	Osceola, g	Nev..	5,000,000	50,000	100	*			
102	Overman, g. s.	Nev.	11,520,000	115,200	100	3,765,800	Jan.	1889	.25
103	Park, s.	Utah	2,000,000	200,000	10				
104	Peer, s.	Ariz.	10,000,000	100,000	100	145,000	Jan.	1889	.10
105	Peerless, s.	Ariz.	10,000,000	100,000	100	370,000	Mar	1889	.25
106	Phœnix	Ariz.	500,000	500,000	100				
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	1,405,600	Apl.	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	103,200	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	.25
126	South Hite	Cal..	10,000,000	100,000	100	195,000	Jan.	1885	.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	.03
142	Tioga Cons., g	Cal..	10,000,000	100,000	10	295,0[illegible]0	May	1888	.10
143	Tornado Cons. g s.	Nev.	100,000	100,000	1	*			
144	Tortilita, g. s.	Ariz.	1,000,000	100,000	100	*			
145	Tuscarora, s.	Nev..	10,000,000	500,000	2	110,00	Oct.	1881	.15
146	Union Con., g s.	Nev..	10,000,000	100,000	100	3,235,000	Jan	1889	.25
147	Utah, s.	Nev..	10,000,000	100,000	100	145,000	May	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. 16th, 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., 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia, $24,90,000. ** 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.	June 1.		June 3.		June 4.		June 5.		June 6.		June 7.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Alice, Mont	....	.....	....	....	....	....	.90	..	....	....	....	....	100
Argenta, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Aspen Mg & S., Colo	....	.....	....	....	....	....	....	....	10 00	....	....	....	100
Belcher, Nev	....	..	3 90	....	3 80	3 75	....	....	....	....	....	....	400
Belle Isle, Nev.	.40	.....	....	....	....	....	.35	....	....	....	.30	....	600
Bodie Cons., Cal.	1.90	.....	1.90	....	....	....	....	....	....	....	....	....	500
Breece, Colo	....	.....	....	....	....	....	.20	....	....	....	....	....	500
Bulwer, Cal	.50	.....	....	....	....	....	50	....	....	....	....	....	700
Caledonia, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	....
Calumet & Hecla	....	.....	....	....	....	....	....	....	....	....	3. 5	3 00	200
Challar, Nev	2 35	.....	2.15	....	....	....	....	....	....	....	....	....	400
Chrysolite, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Colorado Cent'l, Colo.	....	.....	....	....	....	....	1.70	.....	....	....	....	....	100
Cons. Cal. & Va., Nev.	7.75	7.63	7 63	....	....	....	....	....	7.63	....	....	....	900
Crown Point, Nev	....	.....	3.70	....	3 60	....	....	....	....	....	....	....	200
Deadwood, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Eureka Cons., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Father de Smet, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	....
Gould & Curry, Nev.	....	.....	2.40	2 35	....	....	....	....	....	....	....	....	350
Grand Prize, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Hale & Norcross, Nev	....	..	3 90	....	....	....	....	....	....	....	....	....	200
Holyoke, Idaho	....	.....	....	....	....	....	....	....	....	....	....	....	....
Homestake, Dak	....	.....	9.00	....	....	....	....	....	10 00	....	....	....	125
Horn-Silver, Ut.	1.20	.....	1 20	..	1.20	....	....	....	....	....	....	....	1,200
Iron Hill, Dak	....	.....	3	.35	.39	.38	.39	....	.35	....	....	....	1,100
Iron Silver, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Leadville C., Colo	....	.....	....	....	.42	....	....	....	....	....	.13	....	800
Little Chief, Colo	.36	.33	....	....	....	....	....	....	....	....	....	....	5,100
Little Pittsburg, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev.	....	.....	....	....	.70	..	.90	.85	.90	.85	....	....	700
Mono, Cal	1.70	....	1.75	....	....	....	....	....	....	....	....	....	800
Moulton, Mont.	....	..	.47	.42	.41	.43	.48	.47	.45	....	.45	....	1,350
Mount Diablo, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Navajo, Nev	.65	....	.60	.55	....	....	....	....	....	....	....	....	2,400
North Belle Isle, Nev.	....	.....	....	....	....	....	1.50	....	....	....	....	....	500
North Star, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Ut.	....	.....	....	....	....	....	....	....	....	....	35.00	....	150
Ophir, Nev	4 45	.....	4.45	....	....	....	....	....	....	....	....	....	400
Plutus, Colo	....	.....	....	....	90	....	.90	....	....	....	.90	....	800
Plymouth, Cal	....	.....	10 50	....	10 00	....	....	....	....	....	10 50	10 00	400
Quicksilver Pref., Cal	....	.....	....	....	....	....	....	....	....	....	39.00	....	100
" Com., Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Robinson Cons. Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Savage, Nev.	....	.....	2.55	....	2 70	....	....	....	....	....	....	....	370
Sierra Nevada, Nev.	....	.....	2.75	....	....	....	....	....	....	....	2 85	....	280
Silver King, Ariz.	....	.....	.75	.....	.75	....	.75	....	....	....	....	....	300
Silver Mg. of L. V.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Small Hopes, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Standard, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Stormont, Utah	....	.....	....	....	....	....	....	....	....	....	....	....	....
Yellow Jacket	....	.....	....	....	3 75	....	....	....	....	....	....	....	25

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 1.		June 3.		June 4.		June 5.		June 6.		June 7.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alta, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Amador, Cal	1.68	....	....	....	....	....	....	....	....	....	....	....	1,000
American Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Astoria, Cal	.20	....	.20	....	.20	....	....	....	....	....	.20	....	2,200
Barcelona, Nev.	....	....	.60	....	.55	....	.50	....	.60	....	.60	.55	1,500
Best & B'licher, Nev.	3 65	....	3.65	....	....	....	....	....	....	....	....	....	400
Brunswick, Cal.	....	....	.07	.06	.07	.06	.07	....	.07	....	.06	....	2,300
Buffalo Iron Min'g.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bullion, Nev.	....	....	....	....	....	....	1.20	....	....	....	....	....	300
Cashier, Colo	....	....	.03	....	.04	....	.05	.04	.05	....	.04	....	2,300
Castle Creek, Id.	....	....	....	....	....	....	....	....	....	....	....	....	....
Central Ariz., Ariz	....	....	....	....	....	....	.05	....	.05	....	....	....	1,000
Colchis, N. M.	....	....	....	....	....	....	....	....	....	....	....	....	....
Commonw'th, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....	....	....	....	....	....
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Del Monte, Nev.	1.25	....	....	....	....	....	....	....	....	....	....	1.25	600
Eastern Oregon	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, U. S. Col.	1.60	....	....	....	1.60	....	....	....	1.60	1.50	1.70	....	500
Excelsior, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Exchequer Nev.	....	....	....	....	....	....	1.10	....	....	....	....	....	200
Hector, Cal	....	....	.35	.30	.28	.27	....	....	.25	....	....	....	1,500
Julia, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Kingst'n & Pemb'ke	....	....	....	....	1.25	....	....	....	....	....	....	....	500
Kossuth, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Lacrosse, Colo	.09	....	.09	....	.09	....	.09	....	.09	....	.09	.08	14,200
Lee Basin, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Mexican, Nev.	3.50	....	3.45	3.35	3 60	....	....	....	....	....	....	....	700
Middle Bar, Cal.	....	....	....	....	.28	....	.29	....	.28	....	.29	....	2,300
Moniter, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Mutual Sm. & M. Co	1.45	....	1 45	....	1.45	....	1.45	....	1.45	....	1.45	....	1,600
Nevada Queen, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Com'nw'th, Nev.	1.30	....	....	....	....	....	....	....	....	....	....	....	200
Oriental & Mil., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Ariz.	....	....	.20	....	....	....	....	....	....	....	.25	.22	2,000
Potosi, Nev	....	....	....	....	2.70	....	2.40	....	....	....	2.20	....	800
Rappahann'k, Va	.07	....	.07	....	.07	....	.07	....	.07	....	.07	....	6,300
Santiago U. S. C.	....	....	....	....	....	....	....	....	....	....	....	....	....
Scorpion, Ariz.	....	....	....	....	....	....	.60	....	....	....	.70	....	400
Shoshone, Idaho	....	....	....	....	....	....	....	....	....	....	.07	....	500
Silver Cliff, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Cord, Colo.	....	....	....	....	....	....	.60	....	58	....	.57	....	1,500
Silver Hill, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Queen	....	....	....	....	....	....	....	....	....	....	....	....	....
State Line, 2&3, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sullivan Con	1.25	....	1.25	....	1.25	....	1.25	..	1.25	..	1.25	....	1,800
Sutro Tunnel, Nev.	.09	.08	....	....	....	....	....	.09	.08	....	....	....	3,500
" Trust Cert.	....	....	.62	....	.51	....	.51	.50	.52	....	....	....	2,600
Tornado, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Union Cons., Nev.	....	....	3.60	....	3.60	....	3.8	3.75	....	....	....	....	550
United Copper	1.05	....	1.10	....	....	....	1 10	..	1 15	....	1 10	....	1,300
Utah, Nev.	....	....	....	....	....	....	1.20	....	1 20	....	....	....	300

*Ex dividend. † Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment unpaid. Dividend shares sold, 22,250. Non-dividend shares sold, 55,950. Total New York, 78,200

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	May 31.	June 1.	June 3.	June 4.	June 5.	June 6.	SALES.
Atlantic, Mich.	1.00	.....	9 50	....	....	9.50	250
Bodie, Cal.	....	.....	....	....	.80	.80	300
Bonanza Developm't	....	.....	....	....	....	....	....
Bost. & Mont., Copper	34.38	32.75	34.50	34 25	36 63	34 25	37.00	36 25	39.50	36.98	40.00	38.25	14,834
Breece, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Calumet & Hecla	218	.....	....	....	219	218¼	218½	....	....	....	218	....	109
Catalpa, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Central, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Chrysolite, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Con. Cal. & Va., Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo.	1.20	.....	1.20	....	....	....	....	....	....	....	....	....	600
Enterprise.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich.	....	.....	....	....	10.00	....	....	....	....	....	10.00	....	20
Hale & Norcross, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Honorine, Utah	....	.....	....	....	....	....	....	....	....	....	....	....	....
Little Chief, Colo.	....	.....	....	....	....	....	....	....	....	....	.37½	....	850
Little Pittsburg, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Mono, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Napa, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Ontario.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Osceola, Mich.	....	.....	10.00	....	10.00	9.50	....	....	....	....	....	....	270
Pewabic, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Quincy, Mich.	53.50	....	52.00	51.00	....	52.00	....	....	....	....	53.00	....	41
Ridge, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nev., Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Silver King, Ariz.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Standard, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Tamarack, Mich.	....	.....	107	1 5	107	....	107	106¾	106	....	105	....	228

NAME OF COMPANY.	May 31.	June 1.	June 3.	June 4	June 5.	June 6.	SALES.
Alloues, Mich.	....	.....	1.00	.....	....	.....	200
Arnold, Mich.	....	....	....	....	....	....	....
Aztec, Mich.	....	....	....	....	....	....	....
Brunswick, Cal.	....	....	....	....	....	....	....
Butte & Boston	....	....	....	....	....	....	....
Canada	....	....	....	....	....	....	....
Cashier, Colo	....	....	....	....	....	....	....
Crescent, Colo.	....	....	....	....	....	....	....
Cusi, N. Mex.	....	....	....	....	....	....	....
Denver City, Colo.	....	....	....	....	....	....	....
El Cristo, W. S. C.	....	....	....	....	....	....	....
Everett	....	....	....	....	....	....	....
Hanover, Mich.	....	....	....	....	....	....	....
Humboldt, Mich.	....	....	....	....	....	....	....
Hungarian	....	....	....	....	....	....	....
Huron, Mich.	....	....	....	....	....	....	....
Kearsarge, Mich.	5.58	....	....	....	5.60	5.25	500
Mesnard, Mich.	....	....	....	....	....	....	....
National, Mich.	....	....	....	....	....	....	....
Native, Mich.	....	....	....	....	....	....	....
Pontiac	....	....	....	....	....	....	....
Rappahannock, Va.	....	....	....	....	....	....	....
Rockland	....	....	....	....	....	....	....
Santa Fe, N. Mex.	.61	.55	....	....	62½	....	.73	.68	.75	.70	5,450
Security, Colo	....	....	....	....	....	....	....
Shoshone Idaho	....	....	....	....	....	....	....
South Side, Mich.	....	....	....	....	....	....	....
St Louis Cop.	....	....	....	....	....	....	....
Sullivan, Dak	....	....	....	....	....	....	....

Boston: Dividend shares sold, 17,502. Non-dividend shares sold, 6,150. Total Boston, 23,652.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	June 1.		June 3.		June 4.		June 5.		June 6.		June 7.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal.	....	.....	....	....	....	....	....	....	....	....	....	....	....	....
Buck Mountain Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	....
Cameron Coal & Iron Co	....	.....	....	....	....	....	....	....	....	....	....	....	....	....
Ches. & O. RR.	100	.....	....	....	....	....	....	....	....	....	....	21¾	21	2,765
Chic. & Ind. Coal RR.	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
Col. & Hocking Coal	100	.....	....	17	....	....	....	15½	....	....	....	....	....	200
Col., C. & I	100	.....	....	....	....	26	....	26	....	25¾	25	....	....	500
Consol. Coal	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & H. C.	100	140½	140	141⅜	139¾	141⅛	140¼	141⅛	140⅜	142	141¼	143½	142	7,576
D., L. & W. RR.	50	143⅜	143¼	143⅝	142¾	143½	143⅛	143¾	143¼	144⅝	143⅝	144⅝	143⅝	45,810
Hocking Valley	100	....	....	16¼	15⅞	16	15½	16	....	16¼	15½	15½	14¼	4,663
Hunt. & Broad Top	....	19	....	....	....	....	....	18⅛	18	18	....	....	....	322
Do. pref.	....	....	....	....	....	....	....	46¾	46½	47⅛	46¾	....	....	650
Lehigh C. & N.	50	.....	....	....	....	....	....	....	....	....	....	....	....	....
Lehigh & W. B. Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	....
Lehigh Valley RR.	50	53¾	....	53⅝	53½	53¾	....	53¾	53⅝	53¾	53⅝	....	....	650
Marshall Con. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Mahoning Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	....
Maryland Coal	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
Morris & Essex	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
New Central Coal	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
N. J. C. RR.	50	101¼	....	103⅝	100½	105	102¾	105⅝	104	106⅝	105⅛	106¼	105¾	18,860
N. Y. & S. Coal	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
N. Y., Susq. & Western	100	9½	....	8¾	....	....	....	9	....	....	....	8¾	....	375
Do. pref.	100	34½	....	....	....	....	....	....	....	34⅜	34¼	33⅝	33⅛	410
N. Y. & Perry C. & I.	100	.....	....	....	....	....	....	....	....	....	....	....	....	....
Norfolk & Western R.R.	100	....	....	15⅞	15⅝	15½	....	16	....	....	....	16	....	405
Do. pref.	50	52⅞	....	....	....	53	....	53⅜	....	53¼	53¼	....	....	1,470
Penn. Coal	50	....	....	....	....	....	....	280	....	....	....	....	....	....
Penn. RR.	50	53	52¾	51¾	50⅛	51⅞	51⅛	52	51¾	52⅛	51⅞	....	....	22,352
Ph. & R. RR.**	50	47⅛	46⅛	46½	45¾	46¼	45⅝	46¼	45½	46⅝	46⅜	46½	45¾	78,647
Sunday Creek Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	....	.....	....	....	....	....	....	....	....	....	....	....	....	....
Tennessee C. & I. Co.	100	37¼	....	37¾	37½	....	....	37⅞	37½	37⅞	37½	39⅝	37⅝	12,425
Do. pref.	....	100	....	100	....	100	....	....	....	100	....	102	100	1,875
Westmoreland Coal	100	*70	....	....	....	....	....	....	....	....	....	....	....	10
Wyoming Valley Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	....

*This sale occurred on May 31st.
**Of the sales of this stock, 20,597 were in Philadelphia, and 58,050 in New York. Total sales, 199,945.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS. May 31.	June 1.	June 3.	June 4.	June 5.	June 6.
Alpha	....	....	....	....	....	....
Alta	1.50	....	1.50	....	....	....
Belcher	....	....	....	....	....	....
Belle Isle	.35	.30	.30	.30	.30	.25
Best & Bel.	4.30	3.10	3 80	3.60	3.60	3 70
Bodie	1.85	....	1.90	1.80	1.70	1 65
Bulwer	.55	....	.50	.45	....	....
Challar	2.30	2.25	....	2.25	2. 0	2.25
C'm'weal'h	5.13	5.00	....	4.75	....	....
Con. C. & V	7.63	7.63	7.63	....	7.75	7.75
Con. Pac.	....	....	....	....	....	....
Crown Pt.	3.80	....	....	3.25	3.55	3.60
Eureka C.	2.00	....	2.20	....	....	....
Gould & C.	2.20	2.50	2.65	2.65	2.55	2.60
Grd. Prize.	....	....	....	....	....	....
Hale & N.	3.95	....	4.00	4.05	3 90	3.85
M. White.	....	....	....	....	....	....
Mexican	3.60	3 45	3.65	3.75	3.55	3.60
Mono	1.65	1.60	....	....	....	....
Mt. Diablo	....	....	....	....	....	....
Navajo	....	....	....	.50	....	....
Nev. Queen	1.50	1.30	1.00	.90	1.05	....
N. Belle I	1.50	....	....	....	....	....
Occidental	....	....	....	1.60	1.55	1.25
Ophir.	4.40	4.40	4.35	4.60	4.40	4.25
Potosi.	2.30	5.25	2.65	2.20	2.10	2.10
Savage	2.65	2.60	2.75	2 60	2.50	2 50
Sierra Nev	2 80	2.75	3 50	2 85	2.60	....
Union Con.	3.40	3.45	3.40	3.50	3.40	3.50
Utah	1.15	....	1.10	1.15	1.10	....
Yellow Jkt.	3.90	3.90	....	3.85	3.80	3.80

high test, 1@1 1/16d. Soda crystals continue dull, £2 7s. 6d.@£2 10s. are about nearest values. Caustic soda.—A fair business was done in 70 per cent towards the close of last week at £6 7s. 6d., and a firmer tone prevailed for a day or two, but the demand has fallen off again, and second hand parcels are offering at £6 7s. 6d. for prompt delivery, while buyer's idea is about £6 5s., and this price would probably be accepted by resellers for June delivery, for fair lines; 60 per cent. selling at £5 10s., and some makers hold for 2s. 6d. more money; 74 per cent, quoted at £6 17s. 6d. to £7, but nothing doing; 76 per cent, £8 5s to £8 10, about nominal quotations. Bleaching powder is still dull, and £6 5s. has been accepted in some cases, although more money is generally asked by sellers. Chlorate of potash—A slow sale at 4½d. to 4⅝d. Bicarb soda is in request at £4 12s. 6d. to £4 15s. per ton for one cwt. kegs, according to brand and quantity, with usual allowances for larger packages. Sulphate of ammonia is still scarce, and £12 to £12 2s. 6d. per ton are spot quotations for good grey 24 per cent, f.o.b., here.

A previous letter, dated May 22d, received too late for insertion in our last issue, has the following: "The only line in heavy chemicals that has shown any signs of vitality lately has been 'saltcake,' in which there has been an extensive business done during the last week, and the price has been advanced 2s. to 3s. per ton. It is thought that there has been an attempt at a 'corner' in this article, but as the salt strike seems to have been averted, prices look like coming back again shortly. If the advance in 'saltcake' is maintained, it will probably cause a compulsory restriction in make of caustic soda, in the case of those makers who are not salt decomposers, as in the present depressed state of the market for caustic soda makers cannot afford to pay any advance for saltcake."

Manchester.

[S. A. ROYCE & Co.'s Report.]

Chemicals.—In many kinds of chemicals a good business is being done, but great depression prevails in the alkali branch. The consumption of bleaching powder has fallen off considerably, and though a recent drop in price has had the effect of somewhat stimulating demand there is still an excessive supply. Caustic soda is also too plentiful, and prices are weak. Soda crystals and soda ash, however, continue to move off at steady figures. The latest Board of Trade returns are, as far as alkalies are concerned, distinctly disappointing. Exports of bleaching materials during April last show a decrease in weight of 1066 tons, and in value of £8422, as compared with the corresponding month of last year; and in alkali during same periods there is a decrease in weight of 2630 tons and in value of £15,139. In sulphate of ammonia there has been little fluctuation in value during the last month; makers are now holding out for better prices, and the tone of the market is certainly healthy. There is not much spot business doing in limesalt, but prices are steady; latest American advices report a good demand and improved prices there. Sulphate of copper maintains its position, quite contrary to general expectation, and very little can be obtained for early delivery. Arsenic is in good demand. Nitrate of soda drooping steadily.

Minerals.—China Clay is in good demand for both home consumption and export; the proposal recently under consideration for the formation of a syndicate of producers of this article has not so far resulted in anything definite. Brimstone is weaker, and imports for last month show a slight falling off against those for April last year, though for the four months ending April 30th last, there is an increase in weight of 35,219 tons, and in value of £3482 as compared with corresponding period of 1888.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, June 7.

At a special meeting of the Building Material Exchange on Monday, a committe of twenty-five members, with Col. George Moore Smith as chairman, was appointed to solicit funds for the Conemaugh Valley sufferers. The amount subscribed thus far is $1500.

Bricks.—Arrivals in the early part of the week accumulated so rapidly that, for a while, receivers were disheartened. It soon became necessary to dispose of holdings at almost any figure obtainable and it would be difficult to ascertain the lowest figure at which sales have been made. Latterly, however, an increased demand for consumption set in and holders have been able to dispose of the greater part of the supply on the market. It is estimated that the surplus offering this afternoon at the close was not over one million bricks. Haverstraws are quoted at from $5 to $6 with the latter figure obtainable on exceptional quality only, about $5.50@$5.75 is probably the average basis of sales. Uprivers are held at from $4.50@$5, and bales at $3@$3.75. In some quarters a more conservative policy is professed, and it is asserted that hereafter makers will use more caution in sending forward cargoes These assertions, we believe, must be accepted with due allowance, for the fact that sales agents are making every effort to induce buyers to believe that prices have touched bottom.

Lime.—Rockland shippers are still resting upon their oars. No shipments have yet been made, but a number of the kilns have started up again. It will probably be two or three weeks before much fresh lime will be obtained from this source. While it is true that stocks in first hands are becoming exhausted, there is a liberal supply held by dealers, which prevents any immediate anxiety as to a scarcity before more shipments are received. We continue to quote the association prices for Rockland, viz., $1 for Common and $1.20 for Finishing. St. John is held at 90c.

Cement.—A somewhat improved demand is reported. We continue to quote $1@$1.10 per bbl. for domestic and $2.40@$2.50 for foreign. Importations of cement during April, 1889, were 164,054 bbls. against 193,950 bbls. during April, 1888.

CONTENTS.

DIVIDENDS.

ASPEN MINING AND SMELTING COMPANY, No. 54 Wall street,
NEW YORK, May 10, 1889.

Dividend No. 7 of TWENTY CENTS PER SHARE has this day been declared on the stock of this company (200,000 shares), payable at the office of the company on and after the 15th day of May, to stockholders of record. The transfer-books will be closed on Monday, May 13th, at three o'clock P. M., and reopened on Friday, May 17th, at ten o'clock A.M.

J. L. TILTON, Secretary.

COLORADO CENTRAL CONSOLIDATED MINING COMPANY.

The regular dividend, No. 28, of FIVE CENTS per share ($13,750), has been declared to the stockholders of this Company, payable on June 10th, at the Farmers' Loan and Trust Company.

Transfer-books close on May 31st, reopening on June 11th.

NEW YORK, May 9, 1889.

W. E. MANTIUS,
Assistant Treasurer.

CALEDONIA GOLD MINING COMPANY (Black Hills),
SAN FRANCISCO, June 5, 1889.

Dividend No. 12, of EIGHT (8) CENTS A SHARE, has been declared, payable on the 26th inst., at this office and at office of Messrs. Laidlaw & Co., 14 Wall Street, New York. Transfer will close in New York on the 15th and in San Francisco on the 21th inst.

(Signed) A. CHEMIMANT, Secretary.

SILVER MINING COMPANY OF LAKE VALLEY, 119 SOUTH 4TH STREET, ROOM 62,
PHILADELPHIA, June 4, 1889.

The Board of Directors have this day declared a dividend of FIVE PER CENT, payable on and after the 20th inst. to stockholders of record on the 13th inst. at 3 o'clock P.M., when the transfer-book will close.

Transfer-book will re-open on the 20th inst.

FRANCIS BACON, Secretary.

MACHINERY FOR SALE.

FOR SALE, CHEAP—TWO PAIRS KROM'S New Swinging Block STEEL ROLLS, good as new.
THEODORE A. BLAKE,
New Haven, Conn.