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WE commend to all in authority the suggestion of our correspondent—a distinguished engineer thoroughly familiar with New York surroundings—that all the oil tanks in the vicinity of cities be buried. The subject calls for prompt and decisive action.

THE CŒUR D'ALENE, IDAHO, MINERS' UNION.

In January the mines of the Cœur d'Alene district in Idaho were shut down, owing to the excessive freight rates demanded by the railroads, which rendered it unprofitable to ship ore to the smelters. In March these rates were reduced to $26, including smelting charges, and the mine owners proposed starting up work; but, as a preliminary, proposed to reduce the wages of common, unskilled labor to $3 a day, miners being paid as heretofore in that district $3.50 a day. This arrangement has been violently opposed by the miners' union, which is there extremely powerful and still adheres to the old, preposterous, and unjust opinion that all labor, whether skilled or unskilled, shall be paid the same rates of wages, that is, the maximum, $3.50 a day. Not content to require its own members to adhere to this edict, the miners' union has forcibly expelled from Wardner and Burke the non-union men who were willing and anxious to work for these extremely liberal wages.

The theory with trades unions, when they think themselves omnipotent, that the wages of all men "skilled or unskilled" in an industry should be the same and that the trade union has a divine mission to enforce this idea, is directly contrary to the laws of our country and is opposed to the very principles of individual liberty. In this free country every man, whether acting for himself individually or as one of a body of men, such as a miners' union, has a perfect right to refuse to work at any wages that do not suit him, and no one has any authority to force him to work on any terms he does not approve. This freedom, however, involves a corresponding respect for the liberty of his fellow men, and deprives him of the right to dictate to anyone what wages he may or may not accept, or what work he may or may not do. In this land of liberty every man has a right to sell his own labor at any price he sees fit, and any attempt to interfere with this right is tyranny, whether exercised by employer or by fellow workman. No more outrageous act of oppression and tyranny can be imagined than that of a body of men preventing a fellow workman from earning his living on any terms that he may himself be willing to accept.

The theory of the Cœur d'Alene Miners' Union, that all workmen whether skilled or unskilled shall be paid the same rate of wages, is preposterous, and if it were possible to enforce it would necessarily lead to a destruction of the industry of the district adopting it, for the best skilled workmen would certainly not remain in a place where they could earn no more than the common or unskilled labor, and would go elsewhere, while all the worthless laborers would flock to a camp where they could not earn less than the wages of skilled workmen. Consequently the mines would soon be filled with incompetent labor receiving the highest rates of wages, and the cost of production would increase to a point where the district could not compete with rival producers, and its mines would have to close. Experience has so often demonstrated these truths that they need no argument to sustain them. The Cœur d'Alene Miners' Union will do well to change, with all haste, its policy to more modern and enlightened lines, and abandon these absurd ideas that because "all men are free and equal" they should all be paid the same wages, and let it extend to others the rights which it asks for its own members, and which every free American is entitled to, namely: To dispose of his labor as he chooses without let or hindrance from any one.

THE FLOOD OF FIRE.

Are great catastrophes more frequent and more terrible in this generation than in any preceding one, or is it merely because we hear of disasters in all parts of the world so quickly and so fully through the telegraph and the press, that every morning's paper brings us a catalogue of horrors?

Undoubtedly, there is much truth in the latter proposition. We thrill with pity over the victims of the day before in China, in Mauritius, or in distant parts of our own wide land, the farthest corner of which is brought nearer to us than Philadelphia was to New York within the lifetime of men yet living.

On the other hand, there is a good deal to be said on the question whether, apart from the impression thus produced upon our imaginations, there is a real difference between the former days and these in the number and extent of great calamities. The balance is not easily struck. Certain kinds of devastating evils have undoubtedly been diminished. Famine and pestilence do not rage as once they did. The perils of travel, as measured by the aggregate of injuries in proportion to the aggregate of travelers, have been enormously reduced. Whoever will read MCMASTERS' "History of the American People", will find reason enough for rejoicing over the greater security which even our worst-abused governments of to-day afford to life, health and property, as compared with that which the best governments could furnish at the beginning of this century. In every department of human activity, statistics will show this unquestionable improvement, if they be studied with reference to aggregates and averages, and in their due relation not only to the increase of population, but to the increased activity of the individual. It is not merely that the average duration of human life has been extended, but

that the men who live longer accomplish so much more, and in their restless activity take so many risks unknown to their fathers.

Nevertheless, there are certain conditions in our time, and particularly in our country, which tend to make catastrophes, when they do occur, terrible to an unprecedented extent. One of them is the rapid growth of our population. Floods and cyclones which, but a few years ago, displayed their at most violence in the wilderness, unnoticed of men, now destroy thousands of homes. There is scarcely any place left in this country where a cyclone can amuse itself without widespread mischief; and with regard to floods, it is probable that their frequency and severity have been directly enhanced by the operation of man, especially in the reckless destruction of forests.

Besides the general increase of population, the remarkable degree in which it has been concentrated in cities, promotes certain classes of calamities. There are a hundred theaters to burn where there used to be one; and the congregation of crowds, involving under all circumstances the peril of panic, is greater in a day than it used to be in a year. The buildings are in fact safer; the fire departments are more efficient; and the crowds are more orderly; nevertheless, the elements of possible disaster, however reduced in each case, are present in a vastly greater number of cases; and when the disaster comes, it is likely to be more dreadful.

Not only in great cities, but also in great industrial establishments, congestion of numbers has brought its attendant dangers. The precautions dictated by science are unquestionably effective in a high degree; but they are all liable to fail in the supreme moment when the human mind, which should direct or employ them, is puzzled by terror or excited to unreasoning madness.

This last danger, as well as some of those previously mentioned, can be largely reduced by the systematic discipline of employés, pupils and other persons habitually gathered in large numbers. Of this truth, we have had some striking recent proofs. Hundreds of children have been safely removed by their teachers from burning buildings, where an equal number of adults would have trampled one another to death.

But there is another class of dangers, created by our modern improvements, and to a large extent ignored by our people, until ruin and death enforce too late the lesson of prudence. To this class belong our mining operations, which are steadily increasing both in the depth of the mines and in the number of the workmen exposed in each mine to various dangers. I will not stop here to enlarge upon this theme. It deserves not one, but many, separate articles, enforcing the all-important truth that the methods and precautions which suffice for small and shallow mines are not enough for deeper and larger ones. The recent disaster at Przibram, of which full and intelligible particulars have not yet reached us is an awful warning of the danger of erecting, even under the most skillful direction and careful inspection, a vast structure of underground timbering, so open throughout that, once kindled, it will burn like the fuel in a gigantic stove.

Another of these artifically created perils, characteristic of this generation, is furnished by the operations in the oil regions, and illustrated with frightful emphasis by the recent flood of fire on Oil Creek. Warnings of this danger have not been wanting. It is now many years since, in the execution of some professional commission, I first visited that region and heard, with a thrill of fear as well as sympathy, the accounts of events similar in character, though not equal in extent, to this overwhelming one. At that time it was only a storage-tank or two on the hills struck by lightning, which had taken fire, gradually burned and given way, and precipitated a flood of blazing petroleum upon a town in the valley. But, as far as it went, the destruction was irresistible and complete. The creek had offered no barrier. The burning oil had crossed its surface and destroyed buildings on the other side. I have no heart to repeat the stories of personal torture and death or bare escape, which were then branded on my memory. I finished my work and got out of the region with great inward relief.

But it now appears that the inhabitants of the district exposed to such awful dangers have preferred to "take the chances," rather than to study the conditions surrounding them, and either avert or avoid the terrible possibilities involved. Whether any precautions could have prevented the late disaster may be questionable. One thing is certain, the events themselves were not so entirely novel and exceptional (as, for instance, the occurrence of an earthquake in the same district would have been) as to justify prudent men in not even dreaming of them. There are heights within easy reach of Oil City where people can at least sleep in safety, even if they do business by day in the dangerous valley. But they seem to have "taken their chances."

This temper and habit, by the way, is characteristically American. Our people put more real faith in the doctrine of averages than any other on the globe. Reckoning from statistics that his average chance is good, an American will travel by any railroad, sleep in any hotel, drink any kind of water, submit himself to any climate, or take any risk of sudden death. The average net result is undoubtedly creditable to our national enterprise, and not very injurious to our national death rate. Nevertheless, a little more personal precaution, and a little less reckless trust in averages, would save some lives, avert much suffering, dispense with many sympathetic tears and subscriptions—and improve the average after all!

R. W. R.

BOOKS RECEIVED.

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

Geological Survey of Pennsylvania. A Summary Description of the Geology of Pennsylvania, with a New Geological Map of the State and a Map and List of Bituminous Mines. By J. P. Lesley, State Geologist. Vol. I. Describing the Laurentian, Huronian, Cambrian, and Lower Silurian Formations. Published by the Survey, Philadelphia, Pa., 1892. Pages, 719.

Report of the Director of the Mint upon the Production of the Precious Metals in the United States During the Year 1891. By E. O. Leech, Director. Published by the Government, Washington, D. C., 1892. Pages, 321.

MAPS RECEIVED.

Pennsylvania Geological Survey.—Atlas of the Southern Anthracite Coal Fields. Part IV. b-A.A. Published by the Survey, Philadelphia, Pa., 1892.

Pennsylvania Geological Survey.—Atlas of the Southern Anthracite Coal Fields. Part V. A. A. Published by the Survey, Philadelphia, Pa., 1892.

Pennsylvania Geological Survey.—Atlas of the Southern Anthracite Coal Fields. Part VI. A. A. Published by the Survey, Philadelphia, Pa., 1892.

NEW PUBLICATIONS.

THE CORPORATION PROBLEM. The Public Phases of Corporations, their Uses, Abuses, Benefits, Dangers, Wealth and Power, with a Discussion of the Social, Industrial, Economic and Political Questions to which they have given rise. By William W. Cook. G. P. Putnam's Sons. New York, 1891. 262 pages. Price $1.50.

Mr. Cook is one of the younger members of the New York bar, but he has already achieved a reputation as a legal writer by his "Treatise on Stock and Stockholders and General Corporation Law," which is one of the standard works on its subject. His present book is a popular work for the general reader, and its scope is well shown in the extended title above quoted.

The work is judicial in tone, and the author is careful to present all the different sides of the problem with strict impartiality. He has no hobby to ride, and as the corporation is an unsettled problem, Mr. Cook does not pretend to settle it, or even to prophesy how evolution will settle it. He simply states the case, giving facts, statistics and opinions of other writers, and allows his readers to draw their own conclusions. The style is clear and forcible and maintains the interest of the reader throughout.

The importance to the general public of a full discussion of the corporation problem warrants our noticing at length some of Mr. Cook's statements. He gives credit to the corporation as being an important factor in the advance of civilization, as follows: They have cheapened the necessaries of life, given quick and easy connection between distant points, developed agriculture, mining, manufacturing and commerce; created employment for labor, marketed the products which before were not worth the cost of transportation, lowered the cost of living in Europe and America, transformed the uninhabited wilderness into rich farms, cities, States; found land worth nothing and made it worth millions, and caused an interchange of the manufactures, luxuries, literature, arts, sciences and ideas of the world.

On the other hand he thus speaks of some of the evils the corporations have brought in their train: Some of the corporations have been guilty of bribing judges, buying legislatures, corrupting public officers and sapping the integrity of public life generally. Some of them have taught men that dishonesty is respectable and even honorable, provided it is successful.

The author is an optimist, however, as to the morals of corporations in the future. He says: The days of irresponsible, reckless and dishonest management of corporations are passing away. Honesty toward the Government, the people and the investor is becoming the settled policy of the great corporations. The integrity as well as the talent of America is beginning to assume the control of these colossal aggregations of capital. The controversies of the past 20 years respecting railroad charges, discrimination, pools, railroad wars, useless paralleling of roads, state regulation, the Interstate Commerce act., etc., are discussed at length, and the author foresees that a remedy for these evils is at hand in the unification and consolidation of competing roads, which has already taken place in England and in France, and is rapidly coming in this country.

Stock gambling is thus referred to: "The gambling portion of the Stock Exchange business causes unutterable woe and ruin. Thousands of men fall into that maelstrom every year. Stock gambling is a mania that unsettles the minds of men and unfits them for serious, earnest business. It breaks up homes, disgraces families, beggars the rich, and often leads to suicide. . . . The bucket shop is worse than the Stock Exchange in that it has no redeeming features. It is purely and simply a gambling den and sink of iniquity. It is the kindergarten and hospital of the Stock Exchange. . . . Various remedies have been tried to prevent stock gambling. Statutes have been passed. In Illinois, Pennsylvania, Ohio and other States, the courts favor these statutes, and by enforcing them, have rendered stock gambling somewhat dangerous. In New York and other States the courts have lent little aid in the suppression of the vice."

The strike problem is briefly discussed, and the author sees in profit-sharing a possible remedy. If the day ever comes, he says, when the wage earner is the wage sharer in railroads, the railroad strike will be a thing of the past. He says: "It is doubtful whether strikes or any other power can prevent wages of the unskilled labor of America from going down to the level of European wages. If wages are higher in America than in Europe, European labor will flow into America until a level in wages is reached, when by the raising of wages in Europe or the

lowering of wages in America, the unskilled labor of all lands is destined to meet on a level. A protective tariff cannot prevent it, neither can the strikes of American labor prevent it. Eventually the natural increase of population and the great immigration from Europe will regulate wages. As against these powers the strike will sink into impotence and insignificance." These conclusions of the author are not, however, universally accepted.

In treating of remedies for the railroad problem the author discusses co-operation or profit-sharing, and gives both sides, quoting from an address by Abram S. Hewitt, and from the experience of the Illinois Central Railroad Company in favor of it, and from Herbert Spencer's article on "The Coming Slavery" against it. Co-operative insurance, such as has been adopted by the Pennsylvania, the Baltimore & Ohio, and the Chicago, Burlington & Quincy railroads, is also discussed. Concerning this the author says: "The effect probably will be to make the employee more steady and more content with his lot. It will also tend to increase the power of the railroads themselves. Further than this it will not go. It will not solve the railroad and corporation problem."

State socialism as a possible solution of the corporation problem is considered briefly. The tendency of the German Government in this direction is described and mention is made of Mr. Bellamy's book "Looking Backward" in this connection. The author does not believe in State socialism and expresses himself thus strongly in reference to this remedy: "Why is it that whenever a social difficulty arises or is imagined men seek a remedy through government. Government has been formed to protect rights, not to create them. And government has proved to be the most incapable leader that civilization has known. Its whole history has been one long record of war, rapine, interference, mistakes, incompetency and usurpation. It is the most dangerous force that enters into civilization. It has clogged and misdirected progress in numberless instances, and has rarely aided that progress. It is one of the forces which makes a nation a highly civilized people, but the part that it plays is subsidiary and small. Government is not the power that can solve the problems of the times." We think the author is entirely too sweeping in this statement.

These extracts show sufficiently the scope and character of this little book. The impetuosity and positiveness of youth are evident in its pages, but at the same time it is readable, instructive and suggestive, and it is to be hoped Mr. Cook will continue to devote his ability to the study of these problems upon the correct solution of which the future of the nation so greatly depends.

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.

To Experts in Difficult Shaft Sinking.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I am connected with an enterprise in which shafts have to be sunk to a very considerable depth through quicksand and wet ground, and there is a probability of a commission of engineers being appointed to examine and report upon the best known methods of sinking. We are familiar with most of the literature on the various methods in use or proposed here and in Europe, but I would like to get into correspondence with engineers and contractors in Europe as well as in this country who have had practical experience in similar work, and who may, through this correspondence, become interested in a great enterprise, either in giving professional advice or in contracting for the execution of the work.

The ENGINEERING AND MINING JOURNAL, I know, reaches all the able engineers of every country, and I shall be greatly obliged if you will allow me through this medium to reach them and ask them to communicate with me, to, I hope, our mutual benefit. SHAFT,

Care ENGINEERING AND MINING JOURNAL, New York.

Prospecting in La Plata, Wyoming.

EDITOR: ENGINEERING AND MINING JOURNAL:

SIR: I have just paid a visit to the La Plata, Wyoming, mining district and think it may interest your readers to hear that the prospects of this district are excellent. La Plata is in the Snowy Mountains, and is about 40 miles north of Laramié City on the Union Pacific Railroad. The mountains consist chiefly of granite and are capped by quartzite. A rich mineral belt two miles wide and eight miles long has been discovered between the granite and the quartzite. It is made up of beds of limestone slates, shales and strips of greenstone, all of which are intersected by dikes of porphyry. The strata are very much twisted and changed. French Creek heads near the quartzite and crosses the mineral belt to the granite and it affords an excellent means of prospecting. Already a ledge of slate containing a rich deposit of silver ore has been discovered.

Libbie Creek also cuts across the beds, but it is not so deep as French Creek. Deposits of lead and silver ores have been found here. Further to the northeast there are to be seen the buildings and workings of the Sherman, Sheridan and North American claims, which were worked some 14 years ago by an Eastern company. Close to these a party of miners are engaged in sinking a shaft 100 ft. deep, and half a mile away another party is running a tunnel 100 ft. in to intersect a silver bearing lode. Farther away still another company has opened a shaft that shows galena. Our prospecting was between French and Libbie creeks. A shaft has been put down 40 ft. through the gangue of a very extensive cupriferous vein which seems to extend right from the granite to the quartzite. The decomposed mass assayed in silver, and as high as $101 in gold was returned.

Three hundred yards away from this shaft another shaft was sunk to the depth of 10 ft. through hornblendic rock. Here again gold was found, but how rich the rock is in gold has not yet been ascertained. Diamond drills are going to be put in operation directly the snow clears away, probably in the middle of June. At the time of writing nothing of course can be done, as the snow is 5 to 10 ft. deep everywhere. We quite expect that La Plata will shortly become well known among mining circles. J. L. MOSHER.

LARAMIE CITY, Wyoming, April, 1892.

Bury the Petroleum Tanks.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Bury the petroleum tanks. Why, in view of the recent petroleum horror following a long list of similar calamities in the past, should it be permitted to store petroleum *above ground* at all, either in country or town? A set of maps showing the terminal oil tanks would exhibit an extent of danger threatening New York, Boston, Philadelphia, etc. - that would astound those several localities. Yet all know how inflammable petroleum is, how much more difficult to extinguish than any ordinary fire, and how much more apt to spread. Think of the destruction to New York shipping were a lot of its oil tanks to simultaneously spill their contents upon the waters of the Hudson or East rivers, that would rapidly distribute the flames about every wharf! Were the tanks sunken this spreading could not occur, and it is the lightning swiftness of this spreading that is the surmounting terror of a petroleum fire.

True it would cost the oil companies a large amount to sink the tanks, and be more expensive to pump the oil therefrom than to deliver it by gravity as at present. But does not public safety require this precaution against a danger so fearfully on the increase? The Titusville and Oil City calamity may be surpassed any day in our great cities even in these times of peace. Should a war occur, and our enemies have emissaries in in our great ports who should conspire to dynamite the petroleum tanks, what would Greek fire or the combined attack of the world's navies be to the sting of this viper which we are allowing to coil about our vitals? Make the companies bury all their tanks; they are just as dangerous as the wires were that we are finally getting safely underground. It did not ruin the telegraph companies to do it, despite their sturdily maintaining that it would, nor will the burying of the demon oil ruin the petroleum companies. Make them do it *at once*. W. S. C.

GENEVA, N. Y., June 14, 1892.

Faulting in Veins.—II.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Mr. L. D. Ricketts (ENGINEERING AND MINING JOURNAL, May 28th), in paragraph 5 of his letter, says: "Clay selvages and slickensides are better developed upon the walls of a simple fault than they are along those that have received ore deposits." I challenge him to prove the proposition from the literature of geology.

Read any careful study of a fault, like that in Curtis' work on the Eureka deposits, and it will be found that the observer recognizes a comparative absence of slickensides—that is to say, a quantity less than the acknowledged movement of the walls would presuppose. This departure from expectation is usually accounted for by supposing that the polishing was once much more abundant, but has been removed in part by abrasion, and especially by attack of solutions upon the walls. And yet, in veins where this attack has reached a maximum, slickensides are comparatively abundant.

In my first letter I described a specimen of slickensides in which two sets of polished striations ran in contrary directions and were so disposed that one could not have been made by the rubbing of a solid substance without obliterating the other. This specimen could have been produced either by the friction of clay under great pressure, or it may have been merely a cast of striations formed in the clay, the rock itself being a vain deposit perhaps of subsequent formation. In the latter case the striation would be due to deformation of the clay, in the former case to frictional polishing, and in either case the walls of the vein may never have moved upon each other to even the smallest extent. Slickensides in that case did *not* prove faulting.

In his third paragraph Mr. Emmons says (ENGINEERING AND MINING JOURNAL, May 21st, 1892,) he "has not yet seen a vein which was not originally a rock fracture on which there had been some displacement—in other words, a fault plane," and it is remarkable that in support of this conclusion he quickly abandons the argument of motion and dilates at length upon a very different thing—the argument of pressure. It is pressure which is the burden of paragraphs 9, 10, 11, 13, 14, 16, 17, etc. When he calls Daubrée to his support (paragraph 17) he produces an example of deformation, for the experiment mentioned is the striation produced in the substance itself by crushing a cake of soap. He wonders that I did not discover that pressure could have produced the slickensided lenses of quartz that I likened to figs *pressed* into a box. I did recognize it, as the very terms of my description show. Those lenses were probably formed by deformation and my assertion that they were not formed by rubbing seems to be his opinion too.

Slickensides formed by deformation under pressure explains the condition of the anthracite bed he mentions near Crested Butte and one of the mines opened by me in China was an admirable example of the same phenomenon. The material was graphitic shale, which was so transformed by deformation that the shale, could be crushed in the hand to a thousand coarse grains, each of which was slickensided on all sides.

In my first letter I objected to using slickensides as a proof of rubbing on the ground that the greatest amount of rubbing we know of has been produced in the bed surfaces of strata that have been folded. The answer is that bed surfaces are sometimes slickensided and Mr. Emmons makes the fact the text for one of his unfortunate allusions to my personal (and humbly confessed) deficiencies of experience. He adds: "I will cite a few instances" and then in paragraph 8 he goes on to describe what seems to be a thrust plane in which a mass of porphyrite has been moved over a bed of shales. His second instance is the gold veins near Breckenridge, Colo., which "have been faulted!" Thirdly, he brings up *a fault* at Smuggler Hill! The whole paragraph is a notable example of his confusion of ideas and evasion of a simple theme. He does not give one instance of slickensides on a bed surface.

I believe that if slickensides were a common result of plication it would be taken note of by geologists, but I do not find any allusion to it in Geikie.

If slickensides in bed surfaces were common, I think Geikie would have mentioned them, and Emmons would have found some real examples. That they occur sometimes I admit, but I have been much struck by the fact that in the immense development of plicated bedding planes we should not find slickensides to be a characteristic proof of motion. Considering the usual condition of bed partings, I think it not unfair to say that bedding planes are not usually slickensided, because in them rock has rubbed on rock; while veins are slickensided because that rubbing has not taken place.

Before leaving the subject of slickensides in bed partings I will instance

a recent case with which your readers are all familiar, Mr. T. A. Rickard's admirable description of the Bendigo gold field. There he found a series of strongly folded rocks, in which great movement must have taken place on the bedding planes. There were also cross faults and strike faults in abundance and the situation seems to offer one of the best opportunities known for the study of this branch of our subject. I believe Mr. Rickard mentions slickensides only twice (pp. 44 and 52 of the pamphlet issue. Trans. A. I. M. E.). On p. 44 he uses the slickensides to prove the existence of a fault. The slickensides mentioned on p. 52 are connected with certain markings which he attributes (p. 54) to lines of cleavage and crystalline lamination "due to compressive strain." Striations in a roof which I judge to be of "broken slaty rock" (p. 47, fig. 35) are mentioned on p. 48. It seems to me that if slickensides had been common, or even noticeable, in the bedding planes of these strongly plicated rocks, the clear sighted and unpretentious Rickard would not have used them as proof of real faulting action.

It seems to me remarkable that a formal attempt to prove relative motion in vein walls should have such poor results as it obtains in Mr. Emmons' hands. He intimates that my errors are due to insufficient knowledge, and that things which are foggy to me are clear as moonshine to a "structural geologist," but his communication shows that fogs may becloud even "an eye especially trained in the observation of structural phenomena." The question before us is, Do slickensides, striations, and clays *prove* faulting, and by faulting my first letter clearly showed that I meant what Geikie means when he says:

"But in many cases the rupture of continuity has been attended with relative displacement of the sides, producing what is termed a fault."—*Text Book, p.* 293.

I have limited myself to slickensides for fear of frightening you, Mr. Editor, and your readers by my tediousness. Striations and clays occupy a more doubtful ground, but they do not by any means range themselves only on one side of the question. As to slickensides I hold that my critics have failed entirely to show that it can be produced by such rubbing as we get in faults. As to the proposition I ventured to defend, having shown three old and one new mode by which slickensides can be produced, three of them being a possible result of pressure without fault-motion, I hold that we have no right to quote slickensides as a proof of faulting only.

JOHN A. CHURCH.

NEW YORK, June, 1892.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Mr. Church's conundrum, "What does vein material show that proves movement in the walls enclosing it," is aptly put. We hear much of the movement of walls on veins, but have little if any proof that such has been the case.

Mr. Gresley, F. G. S., seems to think Mr. Church has reference to stratified beds and gives us an illustrated freak of nature which carries no proof with it. His illustration appears to me to be one case where water undermined the strata, which fell as a table leaf falls when the fifth leg is pushed from under it, and was then banked up on the hanging wall side by sedimentary deposits.

Nature performs some queer freaks, some of which will illustrate that walls do not move on their beds, but on the contrary, in my examples at least, the beds moved on the walls.

At Scott Mine, one of the magnetic iron ore mines of Orange County, New York, we came across "slickensides" on the hanging wall 20 ft. in height composed of highly polished ore; we also frequently came across a similar occurrence in the bed itself away from the walls, showing the movement was in the bed. There were no marks on either wall or in the bed that would indicate that the walls had moved. The pitch of this bed was from 50° to 75°.

At Sterling Mine, the same peculiarities in the bed were seen, but not to such a marked extent. At this mine there is a vertical displacement of 10 to 15 ft., but the ore moved with the strata with no signs of wall movement. This bed has a dip of 15° to 20°. The foot wall is undulating while the hanging is regular. As the rolls in the foot wall are quite deep the ore assumes a thickness in them at times as much as 20 ft., and on the anticlinal possibly not more than 10 ft. In the meantime, the hanging wall remains regular. As the bed assumes a position to correspond with the walls, no movement of the walls could have taken place.

At the Clark mine there is a fault in the strata 30 ft. high. The ore bed was possibly forming when this vertical throw took place and was yet in a plastic state, for it moved down the hill as a land slide banking up to the height of the cut-off. Its progress may still be seer by "slickensides" of ore, which are yet visible on the rocks made by its movement downward.

Many theories advanced to prove geological phenomena are, when questioned, still subject to proof.

E. B. WILSON.

Disk-footed Piles in the Bio-Bio Bridge.—One of the best examples of Brunlees' system of disk-footed piles for bridge foundations in sand beds is to be found in the recently constructed railway bridge which carries the Aranco Railway, in Chili, over the Bio-Bio River. The river at this point is 1¼ mile wide, and its bed consists of sand to a depth of 150 ft. It is very shallow, and even in a time of flood the current does not exceed 6 miles an hour. The bridge consists of 62 spans Warren riveted girders of 82 ft. each, resting on 61 piers of cast iron disk-piles and a brick abutment at each end. Each pier consists of six piles in two rows of three, the rows being 15 ft. apart, and the individual piers of each row 6 ft. from each other. The two middle piles of each pier are 15 in. in outer diameter and 1⅛ in. thick, and their disk feet are 3 ft. 6 in. in diameter; the dimensions of the other piles are a shade less. The level of the bottom of the disk feet is 55 ft. below the rails and 28 ft. below the level of the river bed. The maximum possible pressure at the foot of the disks under a train of the heaviest locomotives is 4·93 tons per square foot on the middle piles and 3·38 tons on the outer ones, and the tested bearing power of the sand at a much less depth than the disks was 7·75 tons per square foot. The disk feet are of the usual shape; they were put down by the water-jet system and were rotated by steam power. This method is much less expensive and more rapid than the system of concrete piers in wrought-iron cylinders, and in the case of the Bio-Bio bridge it answers just as well.

MAGNETIC SEPARATION OF IRON ORE—II.

Written for the Engineering and Mining Journal by Axel Sahlin, M. E., New York.

PART II.—PREPARATION OF ORE.

Three separate operations go to make up the preparation of ore for concentration, viz., mining, drying and granulation.

A. Mining.—When a mine produces magnetic ore of a mixed quality this is generally assorted at the mouth of the mine; the richer ore is shipped while the leaner is thrown on the dump. Often two or more tons of ore have to be cobbled before one ton of good ore can be shipped. Yet the low-grade ore may contain a considerable percentage of iron. If a separating plant is connected with such a mine, the lean ore forms a most desirable raw material for concentration, which can be produced cheaply, the cost of mining being charged to the rich ore, thus yielding a considerable profit. When, on the other hand, the whole body of ore is unfit for direct shipment, the cost of mining must be charged against the concentrates, and the expense for this first operation is the most important of the variables to be determined in the equation of economy.

There is no rule for calculating the cost of mining. The most careful estimates are only too often upset by unexpected discoveries and obstacles. Each case must, therefore, be considered by itself and in the light of all the knowledge available. From the United States census report is found that the average cost of mining one ton of ore in the Eastern States in 1889 was $1.52. With such an expenditure for mining it would be difficult profitably to separate any ore containing less than 36% of iron. As cost of mining decreases a far leaner ore can, however, be treated with good results.

Thomas A. Edison, the great electrical inventor, has for years been interested in magnetic separation, devoting a great deal of time, energy and money to the solution of the problems connected with the subject. Mr. Edison has purchased wide tracts of ore land, principally in the States of New Jersey and Pennsylvania, and at Ogden, N. J., has established a separating plant of enormous dimensions. His method of mining is as broad as the genius and courage of the mind which devised it. The Ogden mine was originally worked as a narrow vein of iron ore carrying about 40 to 45% of iron. Adjacent to this vein are strata of rock varying from 10 to 30%, and probably averaging about 18% of iron. Mr. Edison conceived and carried out the idea of mining the whole of these strata, opening a wide breast, whence every blast brings down a huge quantity of rock. At the foot of the breast this rock is thrown into buckets holding about four tons each and transported by two over-head cables across a free span of about 1,200 ft. to a point exactly above the first crushers, into which the rock is automatically discharged. Each cable has a capacity af about 500 tons in 10 hours, making the total capacity of the plant 1,000 tons of ore per day. Thirty cents per ton has been quoted as the cost of rock delivered in the crusher. and were it not for the very inferior and discouraging quality of the crude material a grand economical success would have been certain. Even as it is Mr. Edison shows by continued outlays for improvements to his plant that he deems economical success probable.

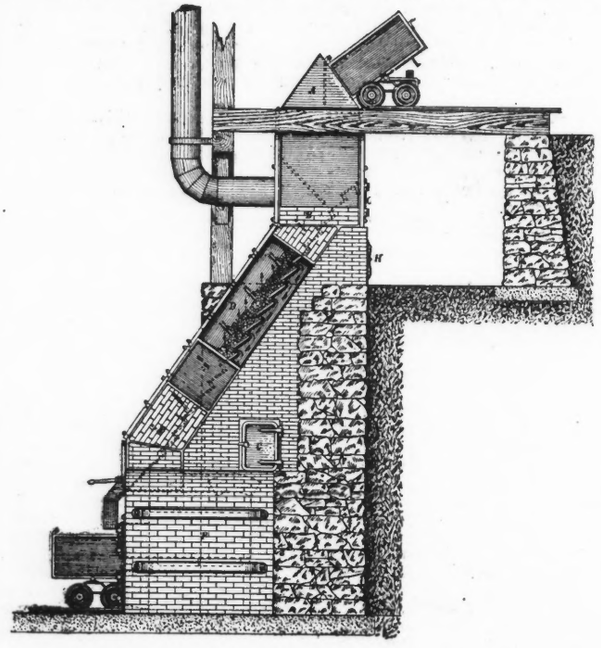


FIG. 1.

At the Croton mines, near Brewster, N. Y., a breast similar to that at Ogden has been worked under more favorable conditions, The ore here contains on an average 37 to 42% iron and from 0·50 to 0·80 of sulphur. The superintendent of the separating works states that the mining and preliminary crushing to 2½ in. mesh does not at this place cost more than 52 cents per ton. To eliminate the sulphur, which occurs chemically bound to the iron as a mono-sulphide, the ore is roasted before being further reduced.

At the mines at Fort Henry, which are the most important in the State of New York, the cost of underground mining is said not to reach 75 cents per ton.

Eight hundred and sixty thousand tons of 50% iron ore are yearly quarried at Cornwall, Pa., from breasts of enormous height and extent at a low figure, which has been given as not far from 14 cents per ton.

The above instances are sufficient to show that in a great many cases mining is cheap enough to warrant subsequent separation of almost any ore. As a rule, however, it is well to bear in mind that to mine and separate lean magnetic ore is not in *every* case a profitable undertaking.

B. The Drying Process.—The ore may be crushed either dry or wet, but in case it only contains enough moisture to make it plastic in a degree, it is very difficult to keep screens and crushing machines open. In such cases it is, therefore, necessary to dry the whole mass of ore before it passes from the coarse crushers to the finer granulating machinery, *i. e.*, provided it is not preferred to add sufficient water to soak the ore thoroughly. The wet crushing reduces wear on the machinery very considerably, but, on the other hand, all parts of the machine coming in contact with the ore must be inclosed in water tight boxes, and this is rather expensive and a source of great trouble when repairs have to be made. The dry method of crushing is almost exclusively in use. Two styles of drying apparatus are at present employed: Krom's drier, and an inclined revolving cylinder. Krom's drier consists of a series of inclined planes, arranged one above the other in a furnace, a modification of the well-known Hasenclever furnace.

A similar drier is illustrated by Fig. 1, and has, when built 4 ft. 6 in.

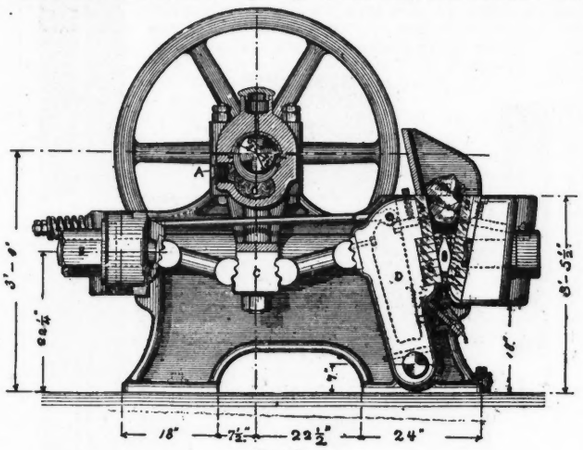


FIG. 2.

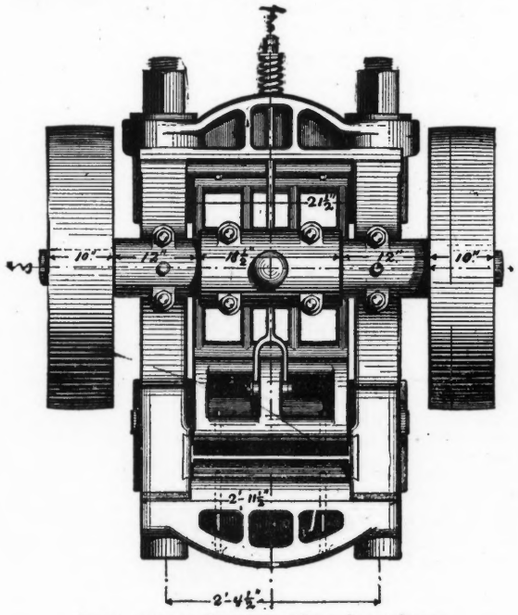


FIG. 3.—KROM CRUSHER (View from above).

wide, an estimated capacity of 8 tons per hour. In order to dry ore advantageously in this drier, it must be rather coarse. If fine, it readily packs together and sticks on the planes, preventing the upper strata of ore from settling down.

An inclined cylinder is better adapted for drying fine ore. Such a cylinder, 48 ft. long by 6 ft. diameter, made out of ⅜-in. boiler iron is used to great advantage at the Benson mines, New York, for drying 500 to 600 tons of ore per day. The cylinder is banded with turned cast iron tires, which travel on rollers. The cylinder revolves about four turns a minute, and is inclined at the rate of about 4:100. Inside the cylinder are riveted six angle irons, running the entire length of the same, and serving to lift the ore from the bottom of the cylinder, and through the passing gases of combustion which enter at the lower end of the cylinder from a grate about 6 ft. by 10 ft. in size, and escape at the upper end, where the wet ore is fed in. Five tons of coal are on the average sufficient to dry, in 10 hours, a quantity of 600 tons of ore. The process appears to be economical, as the escaping gases are very cool.

C. Reduction.—The next process to which the ore has to be submitted is the one of granulation. It cannot be too strongly set forth that granulation, as contradistinct to pulverization, is in 99 cases out of 100 indispensible for successful and economical separation. All magnetic ores are more or less finely crystallinic. The aim is to separate the various crystals without destroying or subdividing them more than is absolutely necessary. For each ore it should be determined by microscopical examinations and practical trials, just to what mesh it is required to be reduced, and the whole mass should be brought as nearly to this size as our imperfect machinery will permit.

Two different processes have been used for reducing iron ore: Gradual and direct crushing. Each may in different cases possess advantages, but as a rule it can be said that gradual reduction in successive passes with screens interposed between each gives a more uniformly granular product than direct reduction accomplished in one single operation. The gradual reduction is best accomplished by crushers and rolls. The lumps of ore are fed into a large size crusher from a hopper constructed of heavy oak plank, lined with sheet iron, or better yet, with bar iron. A hinged apron at the bottom of this hopper regulates the feeding of the crusher. Two men can with this apparatus readily handle the whole 20 tons to be put through hourly. Below the first crusher a diaphragm of chilled iron in the shape of an inverted V divides the ore into two streams falling into a pair of smaller crushers, which discharge the ore, broken into pieces of about 1¼-in. cube and smaller, into an inclined belt conveyer, whence it is delivered on to the feed hopper of the first rolls. Having passed these rolls the ore is elevated to a double screen, which divides it into three different grades. The grades which passes 14 mesh is sent to the separator; the grade passing ⅜-in. mesh goes to the third rolls, while the rejections are sent to the second rolls. The second pair of rolls crush the rejections sent to them from the first screen and deliver them again into the screen where they are again divided as before. The third pair of rolls reduce the ore sent to them from the screens as 14-mesh screen returns rejections to these rolls. The separator, which, will be described later, divides the crushed ore into three different products: The heads, which consist of almost pure magnetic oxide; the middlings, which consist of partly magnetic, partly non-magnetic material, and the tails, which are purely non-magnetic, containing only a small fraction of the original iron. The mid

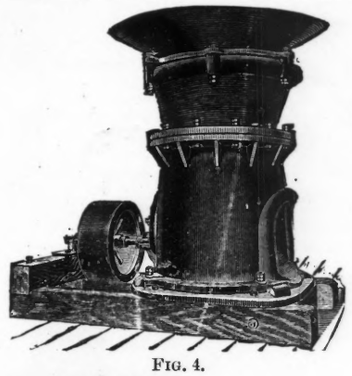


FIG. 4.

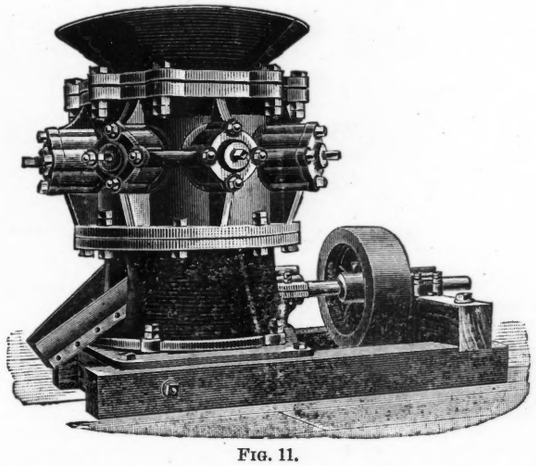


FIG. 11.

dlings made by the separator are passed through the fourth pair of rolls, whence they go back to the separator, where they are treated again and divided into heads, middlings and tails; the middlings returning to the fourth roll are crushed over and over again until they have finally been disposed of as heads or tails. A plant constructed as described above will require between 80 and 90 H. P.

The crushers used for preparing ore work either on the reciprocating jaw principle, originally introduced in the Blake crusher, and afterward modified is various ways, or on the gyrating spindle principle represented by the Gates machine and modifications of the same.

Fig. 2 shows a very good type of a jaw crusher, especially suitable for the granulation of ore. In crushers of this kind the swinging jaw is pivoted either at the upper or lower end, or it can be given a parallel motion by means of links. Some engineers favor the latter construction, but as it is necessary in such a construction greatly to increase the weight of the moving parts, the vibrations will either become excessive, or the speed must be reduced, and speed is in this case equivalent to output. It has in larger crushers with parallel motion been customary to make the jaws in sections moving alternately. This reduces the vibrations but complicates the construction and increases the number of wearing parts. If, as in most crushers of older design, the swinging jaw be pivoted above

the face plates, the greatest travel of the jaw is at the point where the product should be finished and where the greatest amount of power is required. Unnecessary reduction of output and unevenness of product is an inevitable result. The best plan is, therefore, in the opinion of the writer, to locate the pivot of the oscillating jaw *below* the face plates, as in the Krom crusher, shown by Fig. 2. By this arrangement the product is finished very evenly, the travel of the jaw is shortest and the leverage greatest at the point where the largest amount of work is done. The working speed of a 10-in. × 20-in. crusher of this type is 400 revolutions a minute. The swinging jaw is made hollow, so as to decrease its weight. The face plates are made up of steel bars placed edgeways, and will last until completely worn out. The toggles are designed so as to be exposed to rolling friction only, which makes them to outlast greatly toggles oscillating or sliding in their sockets. A-10 in. × 20-in. Krom crusher requires 15 H. P. to run it. It will break 25 tons per hour from sizes up to 8 in. × 16 in. to pass 2½ in. mesh.

The gyrating crushers of the Gates type, Fig. 4, are remarkable for great capacity and the small power required in proportion to the output.

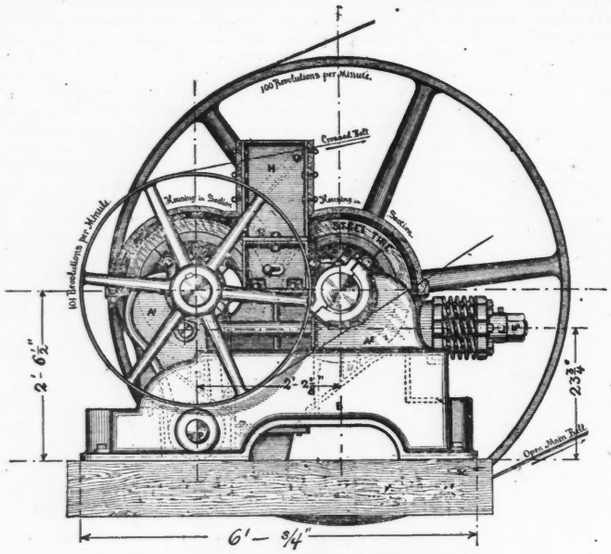


FIG. 5.

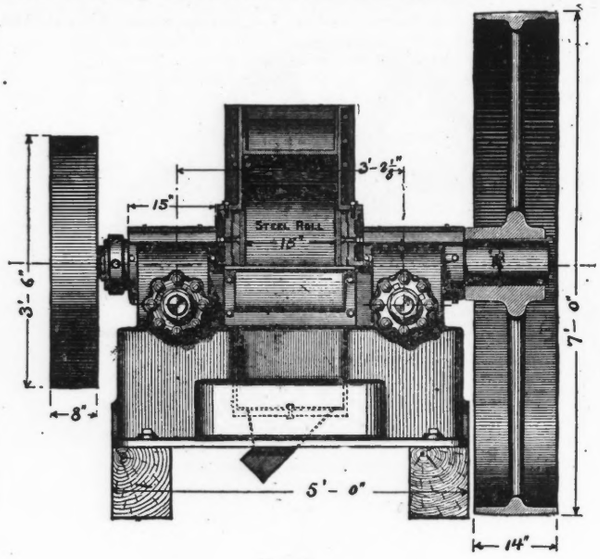


FIG. 6.

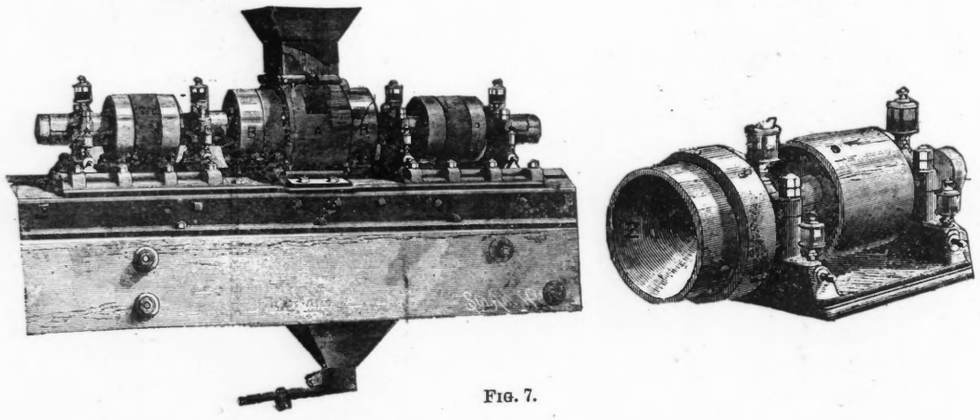


FIG. 7.

The crusher consists of an inverted outside cone, lined with segments of chilled iron. Inside this cone gyrates an upright spindle of forged steel, over which is slipped a cone of chilled iron, corresponding to the segments of the outer cone. The action of this crusher is continuous, and the resistance at any one moment is on one-quarter of the circumference only. The jar when the crusher is working is very slight as compared to that caused by the jaw crusher. A Gates crusher with three 10-in. × 20-in. openings will crush about thirty tons of ore per hour to 2½-in. mesh, and requires from 30 to 40 H. P. to drive it.

The rolls illustrated in their present form by Fig. 5 are one of the latest and most successful modifications of the old Cornish rolls, and present many valuable features. Both rolls are driven at an almost uniform speed, making any slip of the pieces of rock entering impossible. The rolls are held together by tension rods and spiral springs, the sliding roll being hinged so that it can swing back freely should the work demanded overcome the strain allowed by the spiral springs; still the construction is so solid that the vibrations are very slight. The Krom rolls, Fig. 7, are 26 in. diameter, 15 in. face. They are driven 100 revolutions per minute, and will reduce from 20 to 25 tons of magnetic ore from ⅝ to 10 mesh. per hour. To hold rolls running at this rate it is absolutely required to use spiral springs, as the old-fashioned levers and counterweights would continually be on the "jump." The springs before leaving the shop are compressed so that they with their washers will act as a solid block until a strain of 15 tons is reached. At this weight the springs will begin to yield. The self-contained spring box makes it possible for one man with a small wrench, or even with his bare hands, to adjust the rolls to crush to any fineness desired. The feed arrangement is as simple as it is effective, and will need no explanation. The most important parts of a set of rolls are their faces or tyres. Many makers use these made of chilled iron or out of high carbon steel. The writer's experience, however, leads him to regard with favor tyres made out of rather soft forged or rolled open hearth steel. One pair of 26-in. × 15 in. Krom rolls, which had been constantly at work for thirteen months daily reducing from 50 to 80 tons of ore from 1½-in. to 8-mesh were recently examined by the author. The soft steel tyres were found in good condition, and apparently capable of two or three years more of service. There had been no repairs of any description required since the rolls were first started. Hadfield's high manganese steel, when once properly mixed and cast, would probably make an excellent material for roll tyres, as it combines the hardness of chilled iron with the toughness of soft steel.

While dealing with crushing appliances, two classes of auxiliary machinery require mention: elevators and screens.

Elevators succumb to wear more rapidly than any other part of a granulating plant. Link belts, iron chains and screw conveyors have proven decided failures for handling large quantities of crushed ore. Leather or rubber belts, to which steel or malleable iron buckets are riveted, stand better, but the best practice, wherever such a course is possible, is to use horizontal and inclined carrying belts for elevating and conveying. This system of conveyor belts has been almost exclusively adopted in Mr. Edison's separating works. The greatest inclination at which a belt will effectively elevate is, however, only from 27° to 30°, and as a consequence long belts are required to reach any considerable elevation, and the buildings containing the crushing plants must be large in proportion.

Screens are also exposed to a considerable amount of wear. It is therefore necessary to so construct them that the screen plates can be readily exchanged without necessity of removing the centres or shafts. A hexagonal prismatic shape is in the opinion of the author the most economical. The screen shaft should be placed at an adjustable angle, so that the time during which the ore will remain in the screen can be regulated to a nicety, and the work thus equalized between the various parts of the granulating plant. Perforated steel plates with oblong diagonal slots, fastened by means of wire staples to the inside of rectangular hard wood frames, which can readily be clamped onto the cast iron screen centers, should be used for screens. The rectangular form of the frames makes it possible to reverse them before the plates nearest the end of the screen, where most of the wear invariably comes, are cut through. Thus increased service is obtained from each suit of plates. Screens of woven steel wire are also used in many places, and answer fairly well, but they have a tendency to clog up, and their durability is far less than that of the plate screens. The hoppers below the screens should be lined with sheet iron or, better yet, with light bars of flat iron placed at intervals. The spaces between the bars soon fill up with fine ore, which effectively protects the bars as well as the wooden casings. For return chutes cast iron pipes are to be recommended.

Direct crushing in one pass has been effected by two very ingenious machines, the Sturtevant mill and the Gates granulator.

The Sturtevant mill is shown by Fig. 7. It consists of a chamber of cast iron fitted with perforated screen plates having oblong openings about ¼ in. wide. At the top of this chamber a hopper for feeding the ore is provided. From opposite sides two cups or cones of chilled iron enter the chamber, through openings provided with exchangeable collars. The cones are revolved in opposite direction at the speed of about 900 revolutions per minute. The ore, which must be absolutely dry, is charged in lumps preferably about 4 in. cube. When the chamber is filled the ore packs itself against the revolving cones and the grinding action commences. Exactly what takes place inside the mill is difficult to describe, but the ore is rapidly crushed, and pressed out through the slots in the screen blocks. The dust created is taken care of by a suction fan, connected with the hopper under the machine. The product is passed over a screen of suitable fineness and the rejections are returned to the mill and reground. The capacity of the Sturtevant mill, when reducing suitable ore to not too fine a mesh, is enormous. A mill with 20-in. cups will, it is stated, crush about 20 tons per hour of calcined ore to 12 mesh; the wear amounting to only one-half cent per ton of ore crushed. On hard ore the wear is very considerable and it is conceded that rolls in such cases will be more economical than Sturtevant mills. A gradual reduction will also in the majority of cases give greater uniformity of product. The Sturtevant mill alone is said to require about 115 H. P. applied on the mill. On the other hand this mill simplifies the plant and reduces the first outlay for plant to some extent.

The Gates granulator is a crushing machine which has recently been placed on the market. Its principle is the same as that of the Gates crusher described above, but the segments composing the outside hollow cone are supported by springs yielding under a certain pressure. Samples of ore crushed by this machine show a very superior and even granulation. It has been adopted for one of the separating plants now being built in Canada, but the author has no exact figures or practical results as to its performance.

Pulverizing machines should under no circumstances be used for preparing ore as they, even when grinding coarse turn a large percentage of their product into fine dust, whereby iron is invariably lost in the tails. Besides, it is a decided waste of power to reduce any portion of the ore finer than is absolutely necessary. Under the head of pulverizing machines come all ball and roller mills, stamps, pneumatic mills and beater machines in general.

The cost of granulating an ore depends, in the first place, on the nature of the ore, and on the fineness of granulation, Besides local conditions such as cost of fuel, labor, etc., must be taken into account. As a rule it is safe to estimate that one ton of ore in the Eastern States can be reduced to 20 mesh by means of crushers, and rolls for less than 50 cents a ton. In many cases even for less than 25 cents per ton. It is stated that the Sturtevant mill will reduce calcined ore to 12 mesh at a cost of 22 cents per ton.

VON SCHULZ & LOW'S METHOD OF ESTIMATING LEAD IN ORES.*

By J. E. Williams, Chemist at the Pennsylvania Lead Works.

In November last I had a communication from Von Schulz & Low, of Denver, in which they described a new method of estimating lead in ores. They claimed that it was far superior to the fire assay, which is frequently very erroneous and influenced by the presence of impurities. The method consists essentially in forming lead sulphate and precipitating the lead by means of ammonium chloride in the presence of sheet aluminum. The details of the process are as follows:

Provide three wash bottles containing (1) distilled water or water free from chlorine; (2) dilute sulphuric acid made of one part of acid to nine parts of water free from chlorine, and (3) a saturated solution of chloride of ammonium. Treat one gram of the ore in a small narrow griffin beaker, covered with a watch glass, with 10 cc. of pure strong nitric acid and 10 cc. of pure strong sulphuric acid. Heat strongly until all the nitric acid is expelled and the sulphuric acid is boiling freely. Then allow the contents to cool and add 10 cc. of the dilute sulphuric acid mentioned in (2). Afterwards add two grams of Rochelle salt, and when this is dissolved add 40 cc. of water (1). Heat it to boiling and allow it to stand and settle for two minutes. Then filter and wash with dilute sulphuric acid. Place three pieces of sheet aluminum in a flask, each piece measuring about $\frac{1}{16}$ in. thick by ⅝ in. wide and 1¼ in. long. Set the filter paper and contents in a funnel over the flask and dissolve the sulphate of lead in the filter with boiling chloride of ammonium solution (3). Use the wash bottle stream as a sort of stirrer until the sulphate is all dissolved, and then wash the filter well with the same solution, taking care to keep the bulk of the filtrate as small as possible.

This method of dissolving the sulphate of lead on the filter will suffice with most ores, but where the amount of gangue is large, especially in the presence of much sulphate of calcium or barium, it is safer to rinse the contents of the filter back into the beaker with the hot chloride solution and heat the mixture to boiling and then filter and wash through the same filter.

Heat the filtrate to boiling and keep it boiling for five minutes. Then remove the heat and shake the flask round a little to collect the lead and afterward fill the flask with cold water. Invert the flask and discharge the contents into a large casserole and wash there. Remove any particle of lead adhering to the aluminum by rubbing it off under water. Decant the water carefully and rinse the lead into a small (2½ in.) porcelain dish. Then decant as much water as possible and collect and press the lead into a thin sheet with an agate pestle. Wash the lead several times with distilled water and then dry at a very gentle heat. The drying is facilitated and sticking to the dish prevented by washing the last time with alcohol. Brush the lead into the scale pan and weigh The lead thus obtained is practically free from Ag, Au, Cu, Sb, Bi, etc. A little insoluble residue from the aluminum is sometimes seen; this may be either removed by a brush or, if of very small amount, neglected. Commercial aluminum usually contains too much silicon, but much purer aluminum is now supplied by the Pittsburg Reduction Company. The same aluminum may be used repeatedly until it becomes too thin and light to remain at the bottom of the liquid during the precipitation.

Messrs. Von Schulz & Low say of this method:

"By the universal adoption of this method the lead assay would lose most of its uncertainty and stand on a par with copper and zinc. As smelters will not pay for lead on the basis of any wet assay, it becomes necessary to make a deduction, as in the case of copper, to arrive at the dry assay. We would suggest a reduction of 3% from the wet assay as being both proper and sufficient. Our method, as detailed, is applicable to all kinds of ores, mattes, etc. With ores of special purity the scheme may be changed somewhat, if desired, with a slight saving of time or chemicals. For instance, when the silver present is insignificant in amount, no care need be taken that the reagents are free from chlorine. Again, when antimony is known to be absent, only 5 cc. of sulphuric acid need be used in the decomposition, and no Rochelle salt is required and only half the dilution. To insure good work, however, we advocate the method as it stands. The time required is about the same for copper or zinc, and the cost is less than for the fire assay, especially when the repeats and duplicates of the latter are taken into account. The sheet aluminum does not cost over $1.50 per lb., and a pound will suffice for hundreds of assays."

As far as the direct manipulation of the assay is concerned, there does not seem to be much room for improvement except in a few minor details, which may not suit the convenience of everyone who uses the method. A few minutes may be saved by not getting all the $PbSO_4$ on the filter, but dissolving what remains in the flask (after rinsing twice) and pouring it on the filter before washing the last time with the hot chloride solution. This involves the use of an extra flask to dissolve the $PbSO_4$ into.

One, two or three assays may be made in the same time as the same number of fire assays, but as the "humid" scheme requires much more manipulation than the "fire" in making a large quantity, the "fire" would take less time. Assays by Von Schulz & Low's scheme can be done in less than 40 minutes.

The first trial made in the laboratory of the Pennsylvania Lead Company was on refined lead containing over 99·98% Pb; no account was taken of the impurities, as lead assays are never reported closer than one-tenth of 1%. The result on the above lead was 99·6%. It was found, however, that the results had a tendency to be slightly over than under the truth, as the lead while drying oxidized a little. If this takes place to any extent the oxidation is visible, and the assay can be thrown out. With care the error should not amount to more than two-tenths of a per cent.

A number of assays were carried out, using pure lead with additions of antimony, arsenic and other impurities, but, as Von Schulz & Low state, they do not interfere.

A lump of galena was taken which contained no stains of iron or any impurities visible. This gave, by a number of tests by the Von Schulz & Low method, 86·4% Pb, and fire assay, 83·3% Pb. Another sample of a car load of galena gave 84·4% Pb, Von Schulz & Low, and 81·0% Pb fire assay. Pure galena should contain about 86·6%. Pb. Hence Von Schulz & Low's suggestions to deduct 3% from the wet assay to arrive at the fire assay would seem right.

In laboratories where little lead assaying is done this scheme will prove valuable, as it can be carried out with apparatus always on hand. As for cost, the chemicals are all cheap. The flasks should be of the best, as breakage causes annoyance and delay. If a sand bath is used in the first operation in boiling down there is no danger, and the evaporation is nearly as rapid as over the naked flame. In assaying a matte or speiss this method has proven very valuable. It can be applied to any compound of lead that is decomposed by nitric or sulphuric acid.

* Paper read before the Chemical Section of the Engineers' Society of Western Pennsylvania.

Alloy of Antimony and Iron.—According to Professor Francisco Commelli, in *Il Progresso*, an alloy is obtained by the melting of 400 grams of fresh iron filings with 200 grams of antimony, which, when rubbed with a coarse file, has the curious property of emitting red and white sparks. He supposes that the friction produced develops enough heat to ignite the antimony, the iron merely giving sufficient hardness to the alloy to produce the heat.

Barium and Strontium Nitrides.—M. Maquenne has communicated to the French Academy of Sciences, says *Industries*, the result of his experiments on the formation of the nitrides of barium and strontium, bodies which have been hitherto unknown. They are produced by acting on the amalgams of the metals, which are obtained by the electrolysis of the chlorides in the presence of mercury, with nitrogen at a red heat, and have the formulæ Ba_3N_2 and Sr_3N_2, and yield ammonia by the action upon them of water. Barium nitride absorbs carbon monoxide vigorously, forming a mixture of baryta and barium cyanide, the reaction apparently playing a part in the synthesis of barium cyanide by the simultaneous action of nitrogen and carbon upon baryta heated to bright redness. No such reaction occurs in the case of strontium. This difference between the behavior of the two metals supplies a reason for the comparative efficiency of barium as a source of cyanide which has been found to be sufficiently great to justify attempts on a large scale, which, although ultimately abandoned, have on several occasions approached success.

A New Electroplating Process.—Some months ago it was announced in our English contemporaries that a new electroplating process was being introduced by the London Metallurgical Company. It was stated that the results were good, as the cost was less than that of silver, and the defects of silver and nickel plating were absent; but as is usual with English processes, the principle was kept secret. It now appears that the electrolytically deposited coating consists of an alloy of silver and zinc. When it is desired to protect the silver from tarnishing, about 25 to 35% of zinc is sufficient, but a less costly coating may be produced by employing 40 to 90% of zinc. The bath is prepared by dissolving a suitable quantity of cyanide of zinc in a solution of cyanide of potassium so as to form a double salt with a small excess of the cyanide of potassium. This solution, with the addition of a small quantity of the double salt of cyanide of potassium and silver, forms the electrolyte, which is introduced into any suitable electroplating or electrotyping apparatus. The anode consists of an alloy of zinc and silver in the same or approximately the same proportions as are desired in the alloy to be deposited.

CORRECT PROPORTIONS FOR LOCOMOTIVE STACKS AND EXHAUST NOZZLES.*

By W. H. Lewis.

The reduction of the smokestack near its base is about the only example where the scientific principle of the "contracted vein" proves useful in practical engineering. A hydraulic nozzle constructed on these lines will give a discharge greater by 50 per cent. than a straight one, with the same opening and head. When such a form is given to the smokestack the effect is to reduce the friction of the gases, increase the velocity of their discharge, and offer less resistance to the action of the exhaust, thereby increasing the vacuum and reducing the back pressure in the cylinders. It is, of course, impossible to construct a stack strictly on these lines. From my own experience in contracting stacks of 18 in. extreme diameter down to 13 in., I have found that the best results are obtained with a stack contracted to 15 in. at a point 12 in. above the saddle and tapering to 18 in. at the top, with a total length of stack of 63 in. If contracted below 15 in. the engine will make steam very slowly under natural draft and when first fired up. While the length above given is not arbitrary, I have found that with 54 in. or less in length, the results are not so good.

While considering this principle in a stack it occurred to me that it might also be applied to the exhaust nozzles, and accordingly I constructed one in the shape shown in the figure, with the top of the pipe on a line with the base of the stack.

This arrangement, however, defeated all that we had gained by improving the shape of the stack, for it prevented a proper combination of the gases with the exhaust at the line of contraction. I reduced the height gradually, as shown by the lines *A*, *B*, *C* and *D* (Fig. 1), until at the present time the top is about three inches above the center line of boilers. Though I have not yet succeeded in establishing the correct relation between the top of the pipe and the stack, I still think the principle is correct, and its use will result in a decrease of back pressure in the cylinder, as well as a milder draft that will lead to fuel economy. The developments in connection with the compound locomotive, have demonstrated that steam can be maintained with a much milder draft than is usually employed in the simple engine, and a large share of the fuel economically effected (particularly in the four cylinder type) is due, I believe, to this cause.

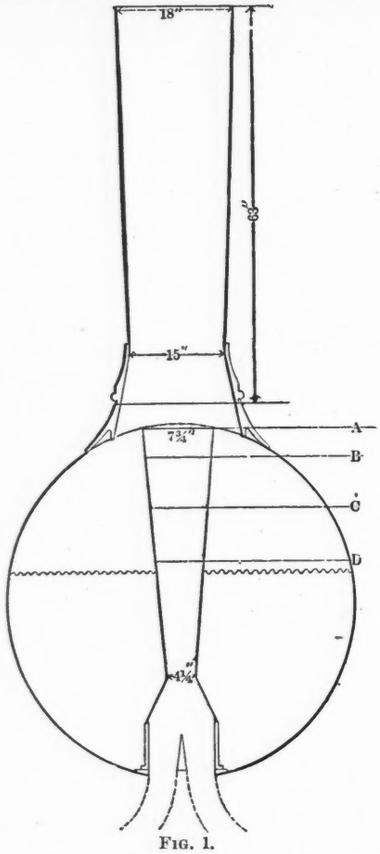


FIG. 1.

With regard to the height of the bridges in the ordinary form of single exhaust pipes, it is my opinion that the hump that appears above the atmospheric line in the indicator diagrams from many engines with single nozzles, is not due to the exhaust blowing over, but to the ordinary increase of resistance to the out-flowing steam. In my experiments with an exhaust pipe, as shown in Fig. 2, in which the bridge approaches within 8 in. of the nozzle, the effect was to send the steam from side to side, and in three months I found that each side of the stack base was cut out to a depth of ¼ in., in an elliptical form, which was 8 in. in length and 4 in. in width. The column of steam remained at the same general angle at which it approached the exhaust tip. This points to the necessity of a low bridge that will allow the column to straighten before it reaches the nozzle. The momentum of the exhaust will insure its upward tendency with a very slight bridge at the base of the exhaust pipe.

*Abstract of paper read at the meeting of the Western Railway Club, Chicago, May 17th.

THE MINES AND MILLS IN PRIBRAM IN BOHEMIA.—II.

Written for the Engineering and Mining Journal by John W. Meier, M. E.

Geology.—The mining region in the vicinity of Pribram lies to the southwest of Prague, in the interior of Bohemia. On the left bank of the river Moldau is found a rolling country with Birkenberg, its greatest elevation, near Pribram, the locality where silver and lead veins occur. The rock in which the ores occur is the gray-wacke slate of the lower Silurian, known as Barrade's *stage B*, or to the Austrian geological bureau as the Pribram slates and sandstones. This is cut off 3·5 kilometres southeast of Pribram by granite and primary clay slate. The first bed of slate and lowest member of stage B there covers these rocks and dips to the northwest. Above this a thick bed of the first sandstone forms a basin, the original dip to the west of which is gradually changed to an easterly one. Then follow strata of the second slate, which stand with a steep dip at first to the east, then to the west, and the last stratum of stage *B* consisting of layers of the second sandstone. Plans of these strata and a vertical section through the same are shown in Figs. 1 and 2.

Stage B has a width of 18·5 kilometres, or 11·5 English miles measured from S. E. to N. W., of which distance the first slate has 1,400 metres, or 4,593 ft.; the first sandstone has 5,000 metres, or 16,404 ft.; the second slate has 800 metres, or 2,625 ft., and the second sandstone has 11,300 metres or 37,074 ft. The slates consist of a dense fine grained, clayey quartzose and micaceous mass of slaty structure, its hardness varying with the percentage of quartz. The sandstone rocks of these zones are known as gray-wacke sandstone. Conglomerates of different sizes occur among them, as a rule quartz pebbles cemented together with quartzose or clayey material; also real sandstones and homogeneous and medium sized or fine grained. The stratification is quite distinguishable in all four of above mentioned zones. The layers generally have a thickness of 3—6 decimetres (12—24 in.). Between the first sandstone and second slate is a crevice filled with clay, which forms the northwest boundary of the richest ore deposits. It has a width of several decimetres, a strike about N. 64° E., and dips toward the northwest at an angle of 71°. Toward the south end of the region in Bohutin it forms the boundary between the first sandstone and the granite, and then again it occasionally pinches out. The layers of both adjoining zones pitch toward it.

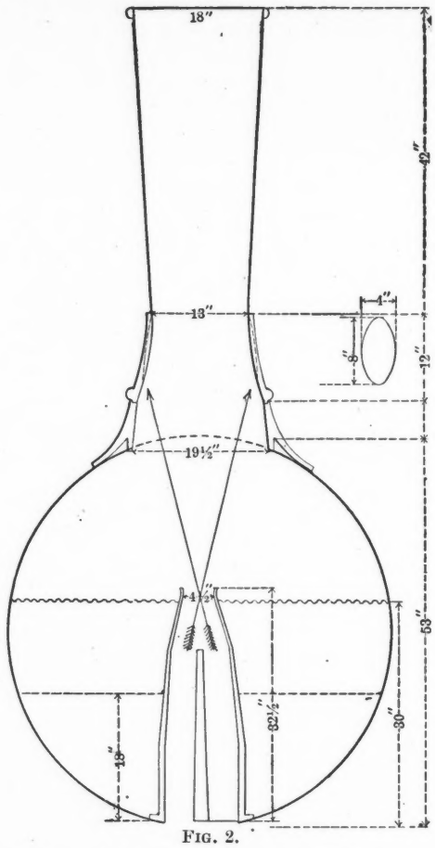


FIG. 2.

The ore bearing district is intersected by numerous masses of diabase rocks, distributed in two localities. In the eastern prospecting is now going on, while the western one, which extends to Birkenberg and Bohutin, is the region for active and productive mining. These diabases, it was thought, had much to do with the formation of the veins, and the geological survey has confirmed this view. The diabase penetrated the layers, whose position had not been changed by the previous upheaval, and the crevices, which were filled up with diabase, rising from the bottom upward, did not long remain open, as otherwise inclosed pieces of sandstone would not be so rare. The contact surfaces between diabase and country rock are sharply defined, the selvages are smooth and both diabase and sandstone are unchanged. These veins of diabase are sometimes strong and their extension in direction of their strike is considerable. They continue on the west side of the clay crevice into the second slate and there form pockets. Diabase pebbles have been found on the surface of the second sandstone at a distance of about 6,000 m. north of the clay crevice.

The Veins.—Most of the diabase veins are accompanied by ore veins, either of lead, silver or iron, the latter of which are of little value at the present time, but which may be considered as an iron hat, below which rich ores may be encountered hereafter. The main veins of lead and silver ores are found in the first sandstone, near the northwest edge of the basin, and in the proximity of clay crevice they grow rich, while toward the center of the basin they will not pay expenses. Development and drifting has therefore been mainly done in a southwest and northeast direction—from Bohutin to Birkenberg—for 4 kilometres along the dividing line of zones. Ore veins at the outcrop show iron only, but at a depth of 60 metres lead ores appear. The richest and most reliable pay ore is found in the first sandstone, near the northwest edge of the basin. The change in character of the country rock there, it is thought, brings rich ore, which continues along the side of the clay crevice. The vein filling consists of dense argentiferous galena, zincblende, siderite, quartz and calcite.

Another variety, called *duerrerz* (dry ore), consisting of a gangue of quartzose, slaty, calcitic and sideritic material, in which are disseminated galena, ruby silver, native silver, stephanite, gray copper and antimony, was discovered in 1882, and is mined mostly in portions of the Anna mine, but is found in quantities also in several of the principal veins below the 23d level. The annual production of *duerrerz* is at present 21,000 to 24,000 quintals (2,358 to 2,695 tons), assaying on the average 64 oz. Ag. and 15% Pb.

From the appearance of the gangue one is frequently able to judge of the amount of ore in the vein, for it has been observed that veins with a soft clay gangue carrying calcite and siderite are richest near the surface in proximity to the clay crevice, while veins with hard gangue become richer with depth.

Minerals.—Seventy-eight different species have been discovered in the

Fig. 1

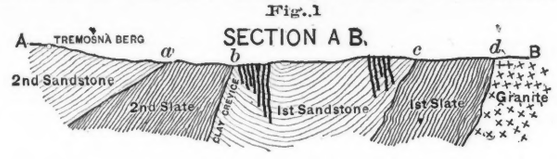
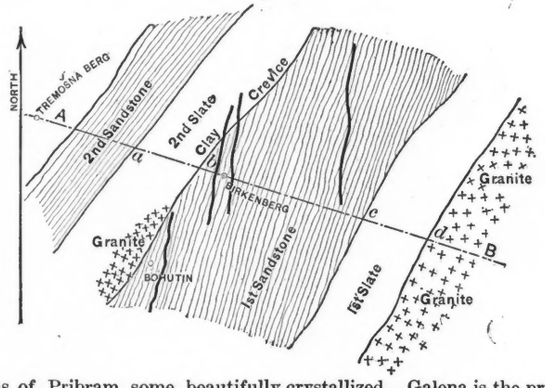


Fig. 2



ore veins of Pribram, some beautifully crystallized. Galena is the principal ore; assays show from 29 to 203 oz. of silver to the ton, while the zinc blende carries but little silver, 11·64 to 17·46 oz.

Some of the veins continue rich to the maximum depth reached—1,080 metres or 3,543 ft.—others show horses or pinch out. When veins reach the clay crevice they split up into smaller veins distributed along the hanging and foot wall. Near Birkenberg, when the clay crevice is reached, the veins are either faulted in an easterly direction or else they seem to have disappeared. In the second slate the veins carry more blende and carbonates and more pieces of country rock are found inclosed in the gangue. The ores were richer near the surface than they are at the present depth, an instance of which is shown by the Lill shaft (depth 432 m.). Rich pockets of gray copper and ruby silver are however occasionally struck.

The principal veins (the total number of veins that have been worked is 40) are the following:

1. *Adalbert vein*, extends as far as is known 1,300 m. in direction of the strike (N. 9° W.), 1,050 m. on the dip (70°–80° towards W.); is the richest of all Pribram veins, its galena carrying 203 oz. Ag. and 75 to 80 p. c. Pb. Its width near Nerd is 8 m., diminishing toward the south.

2. *Abendseits fallender liegend Gang* (flat vein pitching to west). Its greatest thickness is 0·5 m.

3. *Northwest vein*. Its greatest thickness is 0·4 m. The galena of this vein carries 157 oz. Ag. and 84 p. c. Pb. The vein is well developed in the sandstone, but pinches out toward the surface.

4. *Liegend Gang* (flat vein), with a strike S. 10° E. dip 75° W., until 564 m. depth is reached, then is vertical. Its greatest thickness is 0·8 m. Samples of ore assayed 291 oz. Ag. and 80 p. c. Pb.

5. *Fundgrübener Gang*, strike S. 15–20° W., dip 75° in an easterly direction, thickness up to 3 m., carries culling ore.

6. *Eusebi Gang*, strike S. to S. 15° W., dip 74° toward W., greatest thickness is 2 m., its galena assays 130 to 226 oz. Ag. It shows a number of species of rich silver ores.

7. *Widersinniger Gang* (anticlinal vein), strike S. 15° W., dip 75° toward E. Vein matter consists of galena, blende, calcite and siderite.

(To be continued.)

Discovery of Prehistoric Remains.—Remains of prehistoric man of the oldest stone age, consisting of a rudely chipped flint implement among bones of reindeer and other Arctic animals no longer found in that part of Europe, have just been discovered in Hermann's Cave, in the Harz.

THE HASWELL PEROXIDE OF LEAD COATING PROCESS

For many years chemists have proposed to use an electrolytically deposited coating of lead peroxide as a protective covering for iron and steel; but although it is theoretically an excellent process, no one has ever been able to make it a practical one. The process has recently been revived by Mr. Haswell, a chemist of Vienna, and he has christened his modification the "Haswell electro-browning process." The chief improvement he introduces is the fact that the process can be carried out at an ordinary temperature, and the chief drawback of the older methods is thus removed. When a lead salt is electrolyzed metallic lead is separated in a spongy condition at the cathode, and a portion of the lead is peroxidized and appears as PbO_2 in a hydrated state at the anode. The deposit has a casing iridescent appearance which sets off the covered article excellently. This deposit is strongly adherent and is capable of extension in films of almost infinite tenuity, as the iridescent effect is due to the formation of Newton's rings; and the film is an excellent protective covering because of its chemical indifference. In the Haswell process the deposit of peroxide is effected in cold aqueous solution, and is stated to be complete in about 20 minutes. The adhesion is good, and its hardness is sufficient to stand scratch-brushing or polishing. The limit to its protective effect is determined, as in all similar instances, by its degree of porosity rather than by the difficulty with which the film itself may be corroded; but it is sufficient, it is said, to resist the rusting effect of a moist atmostphere, although it cannot be relied upon to withstand immersion in water for any length of time. It is obvious that no change can he expected until the temperature of the decomposition of lead peroxide is reached, and, as a matter of fact, it is found to be stable until about the melting point of tin, viz., 440° Fahr.

ACCIDENTS IN EUROPEAN COAL MINES FROM 1851 TO 1890.

	Average.			Accidents per 1,000 men employed.			
	No. of employed workmen.	Yearly production in million tons.	Annual days' work per miner below ground.	By falling coal and caves.	By explosions.	By other causes.	Total
Belgium:							
1851-60	60,429	8·08	159	.....	0·422	.....	2·932
1861-70	85,467	11·78	180	0·898	0·343	1·364	2·605
1871-80	103,196	15·03	190	0·708	0·487	1·255	2·450
1881-90	103,061	17·87	229	0·678	0·445	1·007	2·130
France:							
1853-60	53,746	7·40	192	1·395	0·521	1·488	3·404
1861-70	78,852	11·83	210	1·053	0·654	1·354	2·961
1871-80	102,680	16·77	227	0·746	0·495	0·978	2·219
1881-90	106,147	20·67	272	0·533	0·354	0·683	1·570
Great Britain:							
1852-60	246,032	61·51	316	1·531	0·992	1·548	4·071
1861-70	319,240	99·01	393	1·304	0·710	1·315	3·329
1871-80	482,183	133·20	344	0·935	0·557	0·862	2·354
1881-90	517,075	163·08	388	0·897	0·289	0·754	1·949
Prussia:							
1852-60	56,089	7·91	174	0·884	0·176	0·994	2·054
1861-70	89,391	18·41	254	1·102	0·404	1·358	2·864
1871-80	151,189	33·77	275	1·080	0·280	1·536	2·896
1881-90	185,815	51·71	354	1·126	0·593	1·423	3·142

Mount Vesuvius in Eruption.—The volcanic energy of Mount Vesuvius shows no sign of abatement. A most magnificent sight is presented in the Atrio del Cavallo, the valley between the two summits, Monte Somma and Vesuvius proper. Here the lava ejected has formed an immense bridge across the valley, and it is constantly gaining fresh accretions. The lava glows with a white heat, and at a night the bridge is magnificently beautiful. Hundreds of persons from Naples daily ascend the mountain by means of the railway to look at this freak of the lava. A new eruptive mouth has opened on Mount Somma. The center of the principal crater shows increased activity, and huge masses of lava are frequently ejected.

Application of Electricity in Mines.—The lead mine of Metternich, in Belgium, is not only lighted by electricity, but the current is utilized in all kinds of work. The daily quantity of mineral extracted is 3,000 tons, and the works operated automatically are so numerous that twenty-five men are sufficient to do all the work. One of the applications of electricity in this mine is new—at least we have not heard it spoken of until now. Each bucket that arrives at the top of the shaft makes an electric contact, and a needle in the office makes a red line upon a band of paper, which is turned by clock movement. This arrangement allows them to keep an account of the regularity of the work, and the number of buckets registered prevents any dispute.

Progress of Street Railways.—It is only seven years since the first electric railway was put into commercial operation in the United States. On January 1, 1888, there were only 48 miles of electric roads in operation, while in 1891 there were 2,893. According to the U. S. Census of 1890 there were then 8,123 miles of street railway tracks in the United States, carrying 2,023,010,202 passengers annually, this figure is almost five times the number carried on all the interurban steam railroads. One-million, five-hundred thousand passengers are said to be carried daily by all the electrical roads, the number of car-miles being about 400,000 per day. The last two figures are, however, probably too high. In September, 1891, the subdivision of the various street railways was as follows: 5,442 miles operated by animal power, 3,000 by electricity, 1,918 by steam and 660 by cable, 1,003 roads use animals, 412 electricity and 54 cable. The diminution in the number of horses in one year was 28,681. England has only 29 miles of electric railroads. The number of passengers carried per year in Philadelphia is given as about 150,000,000, or over 100 rides per inhabitant. The elevated roads in New York carried 400,000,000 passengers. Philadelphia has 510 miles of track, or, with the exception of Chicago, which has 452 miles, it has almost twice as many miles as any other city in the country.

THE NEW RUSSIAN MINING LAW.

The full text has been published of the regulations for private mining enterprise on lands belonging to the Crown, as amended and imperially sanctioned in February last. The terms of the original law of 1887, which applied only to European Russia are, from January 1st, 1893, to be extended to the governments of Tobolsk and Tomsk, the countries of Turkestan and the Caucasus and to the military governorships of the Steppes, Irkutsk, and the Amoor districts. The law as hitherto in force was found deficient in uniformity and scope, and many questions arose in practice which were not provided for, giving rise to lengthy correspondence, the effect of which upon the mining industries was unfavorable. The regulations are divided into six groups, viz., general rules, rules regarding prospecting and the examination of mineral deposits, rules regarding the grant of allotments for exploitation, terms upon which such allotments may be worked, the mutual relations to exist between owners of adjacent allotments, and complaints regarding the conduct of government officials intrusted with the supervision of the works and enforcing of the regulations. The mineral products affected by these regulations are (1) metals and metallic ores (except auriferous sand) and primary deposits of gold and platinum; (2) coals, combustible shale, and bitumens (except naphtha and amber); (3) graphite; (4) sulphur and pyrites; (5) precious stones; (6) fireproof clays and stones; (7) alum and asbestos. The working of limestone, sand, quartz and ordinary clays is permitted only in so far as these materials are necessary for mining or smelting works, except under special terms to be made with the Government. With regard to prospecting and expeditions in search of mineral deposits, it is provided that these may be carried out free of payment, provided such prospecting, etc., be confined to the surface and entail no destruction of timber; no special permission is needed in such cases, nor is there any limit fixed as to area. If, however, the district to be examined be situated in a State forest, or be farmed out, notice must be given to the local ranger or official. Any person desiring to make a closer examination of mineral deposits with the right of removing any timber obstructing his operations, of making borings, sinking shafts, etc., must mark each place so selected by digging a deep hole, and cutting his initials and the date on an adjacent tree. stone, or fixed post. The spot having been thus marked, the local administrative body must be petitioned for a permit to carry on the work of prospecting. The particular mineral sought after must be specified, and a sum of 30 roubles per annum paid for each plot when the permit is obtained. If, on completing the survey, the holder of the permit do not proceed to the working of a mine, he is obliged on the expiry of such permit to fill up or enclose any borings, pits, etc., and to remove the posts or marks which he has made; he must also compensate the State for any loss arising from diminished productiveness of the land, the amount of such compensation to be fixed by the local officers in charge of the Crown domains. Dealing with applications for allotments on which to work mines, it is stated that persons desirous of working mineral deposits which they have discovered may apply for from one to four plots not exceeding a square verst each; but in the case of clay, limestone, sand or quartz the area of a plot must not exceed 5,000 square fathoms. The application must be accompanied by the money necessary to defray the cost of sending government officers to inspect the allotments and satisfy themselves that the specified mineral really exists therein. Regarding the terms on which allotments are held, it is provided that they may be worked until the deposits forming the object of working are exhausted, and that they may be legally inherited or transferred. The holder may use, free of charge, all fallen timber, and may clear away such growing timber as hinders his operations on paying the Crown the market value, or a price fixed by the Ministry of Domains; but he must, in addition, indemnify the Forestry Department for the loss sustained through the cutting down of timber at times and in places not corresponding with the scheme of forest economy being pursued by the department. He may obtain supplies of timber necessary for carrying on his works from the Crown forests at the market prices, or for sums fixed by the Ministry of Domains; but he is not permitted to remove outside his allotment any timber so obtained, or cut down within the same. Preliminary operations for mining must be started within one year of the grant of the allotment, and the actual working of the mineral must have commenced in each plot within three years of the same date. The annual output must not be less than a quantity fixed by the local mining authorities, and this quantitative standard cannot be raised within twenty years of the date of the concession. If called upon to do so the concessionaire is bound to furnish the Government with a return of the output and sale of mineral products effected by him. In addition to the payments and indemnities already referred to he must further pay the Crown an annual rent for the surface of his concession, amounting to the average annual revenue derived by the latter from the land during the three years preceding the grant, but the payment may not be less than one ruoble per dessiatine. If he wish he may give notice of his intention not to utilize any portion of the surface of his allotment while retaining the right of working beneath the same. In such cases a proportionate reduction will be made in the rent, but the remainder must not be less than would be chargeable on the whole surface calculated at one rouble per dessiatine. This rent is payable on the 2d January and 1st July in each year. Four months' grace is allowed, after which a fine of 10% on the outstanding amount is inflicted. In the matter of the relations which must exist between owners of neighboring concessions it is provided that the holder of any one allotment must allow those of adjacent ones to construct roads (railway and other), channels for carrying off water, and other similar works, passing through his allotment, should the inspecting official decide that such are necessary, and not calculated to obstruct him in prosecuting his enterprise.

Allotropic Forms of Amorphous Carbon.—In the granular chalk of Wunsiedal, in the Fichtel Mountains, Germany, is found an amorphous mineral which Sandberger identifies with schungite. To this opinion W. Luzi does not agree, and in the *D. Chem. Ges. Ber.* 25, he gives his reasons for considering it a new form of amorphous carbon, similar to graphite. He gives the following classification of carbon forms: 1. Diamond, 2. Graphite; a, crystalline; b, amorphous. 3. Graphitite.

PETROLEUM AND GAS ENGINES.

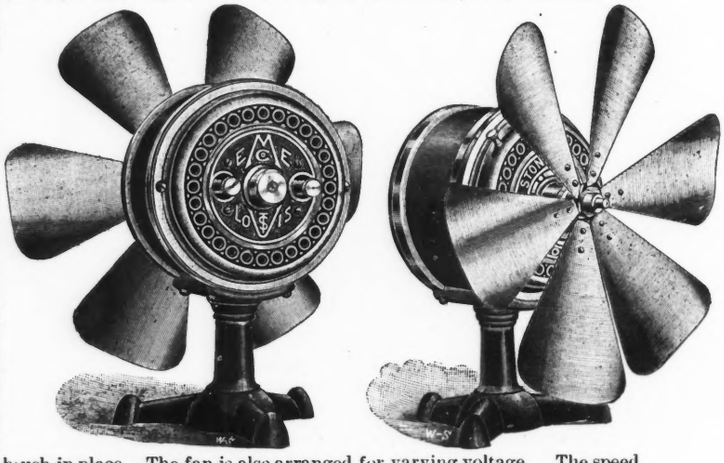
The performances of petroleum may be typically shown by the following example: A 10 I. H. P. Priestman engine, running at 200 revolutions per minute, consumed oil in three separate trials at the rate of 0·94, 0·98, and 0·82 lbs. of oil per brake horse-power hour. The lowest recorded consumption of coal in a steam engine is 1¼ lbs. per indicated horse-power hour, a performance equal to about 1·60 lbs. per brake horse-power hour.

The German Imperial Continental Gas Association of Dessau, after running dynamos by means of gas motors for five years, tabulates the advantages of the system as follows: 1. Small amount of space required. 2. Small consumption of water: 5 to 6 gallons per horse, or less. 3. No coal to carry: independent of railway station. 4. No smoke. 5. No explosions. 6. Cheaper than steam engines in respect of (1) ground required; (2) relative convenience of gas motors rather than steam engines in a town, whence greater choice of place within a town and smaller distances to lay cables; (3) gas motors above 100 H. P. being cheaper than steam-engines, boilers, chimneys, etc. 7. Less loss of electricity, because station more favorably situated. 8. Less attendance and wages. 9. Exact control over fuel. 10. More regular working, and great security of power to meet unforeseen demands. 11. Cost of fuel can be reckoned (the gas company running the electric station) at the full cost price of the gas supply. Gas motors of 120 horse now cost to put up about half what steam engines do; and in the future the price of still larger gas motors may be expected to fall. Petroleum engines have many obvious advantages over gas engines, chiefly in the former being independent of the coal supply which the latter are not.

IMPROVED EMERSON ALTERNATING CURRENT MOTOR FAN.

The electric fan shown in the accompanying illustrations is being introduced by the Emerson Electric Manufacturing Company, of New York. The fan is constructed especially for use where the current is alternating. It is arranged with two carbon brushes in each motor, a communicator and a back contact brush. The brushes are self-adjusting, the back brush being fed automatically against the commutator, and no adjustments is necessary.

The construction of the machine is such that any of the brushes may be put in place by any one, by removing the commutator and inserting the



brush in place. The fan is also arranged for varying voltage. The speed of the fan may be regulated by means of a small regulator on the back. The motor is particularly adapted for use in offices and warerooms where only the alternating currents is usable. The fan runs 1,650 revolutions per minute and it is claimed that when running at this speed it will operate perfectly for six months without further care than occasional oiling. The structure of the fan is such that the motor is entirely covered; thus an advantage is obtained from the fact that the bearings are all within the case and the inconvenience of dropping oil is done away with.

Chromium in Clay.—Mr. A. Terreil gives in the *Comptes Rendus* an account of a malachite green clay found at Alcobacos, near Cameta, in Brazil. The color is due to chromic oxide, of which the clay contains 1·69%. The clay falls to a green powder in water and melts before the blowpipe to a flesh-colored mass, the green oxide of chromium changing immediately to a rose-colored oxide.

Mineral Production of Sweden in 1890.—The following abstract of the mineral production of Sweden is taken from *Berg und Huttenmannische Zeitung* and is official: Gold ore, 1,457·5 tons; silver and lead ore, 14,985·6 tons; copper ore, 20,669·7 tons; nickel ore, 615·6 tons; zinc ore, 61,842·4 tons; cobalt ore, 144·6 tons; manganese ore, 10,698·4 tons; pyrites, 1,134·5 tons; iron ore, 940,428·9 tons; bog ore, 811·9 tons; red ochre, 1,533·746 tons; alum, 981·486 tons; allanite, 20·2 tons; graphite, 13·836 tons; coal, 2,343,895 tons.

Metallurgical Production of Sweden in 1890.—Gold, 87,664 kilos; silver, 4,554,888 kilos; lead, 310,357 tons; litharge, 42·15 tons; copper, 830,·989 tons; copper, malleable and rolled, 362·51 tons; brass, 282,021 tons; nickel in powder, 8·05 tons; nickel in alloys, 155·0 tons; cobalt oxide, 15··039 tons; manganese, 45·0 tons; pig iron, 451,442·7 tons; cast iron, 4,659·5 tons; ingot iron, 281,832·5 tons; Bessemer metal, 94,247·0 tons; Martin metal, 72,984 5 tons; steel, other kinds, 2,055·5 tons; steel and iron worked, 78,998·3 tons; sulphur, 42·2 tons; sulphuric acid, 2,123·7 tons; sulphate of iron, 500·08 tons; copper sulphate, 636·346 tons. In mining and metallurgical establishments 35,227 men were employed, of which number 6,335 were employed in iron mining, 23.615 in iron and steel works, and the balance in other mining and metallurgical works.

ECCENTRIC WIRE CUTTER.

The accompanying illustration represents a wire cutter manufactured by P. A. Frast & Co., of New York City. The cutter is designed for operation on wire, up to and including ¼ in.

The device is arranged to fit in a bench socket, which may be attached to any ordinary work bench. The cutting movement is obtained by the downward pressure on the handle. The bar is pivoted and is arranged with two flat cutting plates with perforations, as shown. The cutting bar

operates on the same center as the handle proper, but its bearing is in the form of an eccentric and the downward movement of the handle forces this plate beyond the perforation in the stationary plate and by so doing makes a fine and perfectly clean cut. The adjustment for lengths of wire to be cut is obtained by means of the gauge as shown, this gauge being movable and held at any desired point by a set screw. The machine is particularly adapted for cutting wire in short lengths, such as are used in foundries and shops for core making and for iron casting chills.

MINERAL PRODUCTION OF ALGIERS IN 1890.

	Tons.	Value.
Iron ore	474,632	$846,849
Lead and silver ore	408	14.259.20
Zinc ore	13,091	241,856.80
Copper ore	11,665	80,958
Salt	23.974	100,420.80

Iron ore is mined at Beni Saf, Ain Mokra and El'-M'Kimen. The first produced 345,000 tons of red iron ore, the latter 129.632 tons of magnetic iron ore. Zinc ore is found in five mines in the Departments Alger and Constantine; copper ore in three mines in Constantine, and silver-bearing lead ore in two mines of the Department Oran. The salt produced comes from 11 salt ponds, four salt wells and one mine in operation in the Departments Constantine and Oran.

GOUGE AND CUTTER GRINDER.

The accompaning illustration represents a grinder manufactured by Pedrick & Ayer, of Philadelphia, Pa. This machine is designed for use in grinding outside gouges, cutters and, in fact, all tools having concave cutting edges. The water is carried from a tank situated at the base of the cone and is distributed from the apex. This prevents the water fly-

ing from the stone at a tangent, and insures even distribution. The water is used over and over again, being carried to the tank by the cone and forced through the pipe to the point of distribution. The machine may be set up on either a bench or a frame. The stone is carried on a steel arbor, which has its bearings in boxes with removable bronze bushings, which are self-oiling and are made either single or double, as preferred.

Mining Operations of the Mound Builders.—In the *Popular Science Monthly*, Professor Newberry states that the native copper mines of Lake Superior were worked thousands of years ago by the "mound builders," a race which inhabited the Central States before the Indians. They also worked the mica mines of North Carolina, the soapstone quarries of the Alleghany range, and the flint quarries in Ohio and elsewhere. His own observations have shown that this race also worked at least one lead mine in Kentucky, and sank petroleum wells in all the principal oil regions.

METALLURGICAL AND CHEMICAL PRODUCTION OF ITALY IN 1890.

Products.	No. of establishments.	No. of workmen.	1890.		1889.	
			Tons.	Value.	Tons.	Value.
Cast iron	12	254	14,346	$425,784	13,473	$424,619
Iron } Steel }	326	13,799	176,374 107,676	9,709,728 5,821.481	181,623 157.899	10,068,680 7,035,167
Gold	3	157	Kg. $206\frac{359}{1000}$	108,836	Kg. $215\frac{846}{1000}$	113,969
Silver } Lead }	1	550	Kg. 34,428 17,768	1,164,432 1.137,152	Kg. 33,685 18,135	1,205,150 1,235,220
Copper & alloys.	10	1,291	6,406	2,404,366	6,904	2,449,200
Mercury	3	50	Kg. 449,226	583.994	Kg. 385,500	454,890
Antimony	1	30	182	54,716	195	56.013
Sea salt	73	2,061	442,010	897,851	420.625	529,790
Brine salt	2	198	9,879	67,799	10,014	54,028
Refined sulphur	14	225	49,337	987,108	53.316	991,717
Ground sulphur	25	900	56,323	1,226.063	54,105	1,077,814
Asphalt	4	115	10,302	80,594	None.	....
Petroleum	4	44	350	42,000	None.	....
Boracic acid } Borax }	11	497	1.874 950	187,400 114,000	2,473	247,200 ....
Coal	10	516	559.300	3.333,640	506.700	3,068,680
Charcoal	15	222	16,750	301,100	13,750	234,500
Alum } Sulphate } Alumina }	7	109	1,294 2,553	26,272 58,430	1,380 2,667	30,116 61,248
Total, 1890	521	21,018	....	$28,762,752	....	....
" 1889	518	24,622	....	29,139,517	....	....
Diff. 1890	+ 3	− 3,604	....	− $376,765	....	....

Quicksilver in Russia.—The nature of the sunken pits and mounds found in Ekaterinoslav and Bachmut, so long a mystery, has been made known through the enterprise of Messrs. Auerbach & Co. According to *Glückauf* there was no mention in Russian history of the people who worked them or of the metal extracted, but it is supposed that they were worked by the people of South Russia 1,000 years ago. Upon investigation a bed of sandstone, impregnated with cinnabar, was found interstratified with beds of carboniferous formation. In 1887, 12,000 tons of ore were raised, giving employment to 125 men. This ore was treated by two cupolas and two reverberatory furnaces, 85 men being employed. Two thousand two hundred tons treated in the reverberatory furnaces yielded 20½ tons of quicksilver; 9,000 tons treated in the cupolas yielded 42·3 tons, being a little over one-half per cent. of metal.

Carnegie on Basic Steel and Armor Plates.—Speaking at the meeting of the Iron and Steel Institute, at London, Mr. Andrew Carnegie said that an exhaustive series of tests just undertaken by the Pennsylvania railway had placed basic steel alongside of acid steel for boilers and fire boxes, and he had been informed that the question was being seriously entertained whether they would not specify that nothing but basic steel should be used for those purposes. He considered that so far as the United States had proceeded in armor it was merely experimental. They had not made enough material. So far it was true that they thought that the admixture of the nickel in certain proportions did give one quality to the steel, viz., tenacity, so that shots passing through it did not crack it, but were held in. With regard to Harveyizing, they had Harveyized a few plates, but the result was a matter to be decided in the future. They had gone to this extent in America. A few experimental plates had been made. and while one part of the plate had shown extraordinary results, the other part of the plate had not. He, therefore, wished to disclaim for America any share of extraordinary credit for anything it had done in armor. What it might do the future would show.

Effect of Time on Strength of Cements.—It is best to test cement briquettes at least 30 days after their manufacture. Baron de Rochmont, engineer to the Port of Havre, gives figures to show that the strongest briquettes, at two days, having a breaking strain of 147 lbs. to the square inch, had a breaking strain of 318 lbs. per square inch. Other cements which had breaking strains of 157 lbs. at 2 days increased to 661 lbs. in 30 days. The weight and tensile strength of cements diminish when they have been kept in stock for some time. In the case of 15 cargoes of cement which came under his notice the weights, on delivery, were between 111 and 121 lbs. per bushel, and the breaking strains were from 75 to 160 lbs. per square inch in 2 days, 160 to 289 lbs. in 5 days, and 339 to 460 lbs. in 30 days. After being six months in store their weights were from 101 to 108 lbs., and their breaking strains from 38 to 114 lbs. in 2 days, 112 to 195 lbs. in 5 days, and 234 to 340 lbs. in 30 days. The fall in weight and strength when the cement has been kept in store for a year is still greater. One cargo weighed on delivery 111 lbs. per bushel, and its breaking strains at 2, 5 and 30 days were 96, 236 and 371 lbs. respectively. After the cement had been in store six months its weight was 106 lbs. per bushel, and the briquettes made from it had breaking strains at 2, 5 and 30 days of 109, 178 and 332 lbs. respectively. After being in store a year the cement weighed 106 lbs. per bushel, and the briquettes made from it had breaking strains at 5 and 30 days of 73 and 250 lbs. respectively.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, JUNE 14TH, 1892.

476,789. Furnace for Smelting Zinc Ores. Selwin C. Edgar, St. Louis, Mo.
476,836. Tunneling or Mining Machines. Reginald Stanley, Nuneaton, England.
476,896. Soldering Metal for Aluminum. Alexius Rader, Christiania, Norway.
476,913. Process of Manufacturing Alloys of Iron or Steel and Nickel. Ezra F. Wood, Munhall, Assignor to Carnegie, Phipps & Co., Limited, Pittsburg, Pa.
476,914. Process of, and apparatus for, the extraction of aluminum. Myrthil Bernard, and Ernest Bernard, Paris, France.
476,955. Amalgamator. William S. Gard, Samuel S. Dalzell and William A. Shafer Moab, Utah.
476,991. Method of, and apparatus for, Separating ores. Thomas A. Edison Llewellyn Park, N. J.
477,026. Apparatus for treating ores. William H. B. Stout, Chicago, Ill.
477,089. Process of purifying ammonia. Hans von Strombeck, New York, N. Y.
477,111. Concentrator. George Gates, Jackson, Cal.

PERSONALS.

The 15th annual commencement of the Ohio State University will begin on the 19th inst., and will be concluded on the 22d.

The 58th annual commencement of Lafayette College, Easton, Pa., will begin on the 25th inst., and will last to the 29th inst.

Mr. W. A. Clark, of Butte, Mont., has purchased the "Mining Journal" of that city. Mr. Clark is also owner of the Butte "Miner," and may consolidate the two.

Mr. Enoch Pratt, of Baltimore, has purchased for $30,000 a building in the Monumental City which he has presented to the Maryland Academy of Sciences as its home.

Mr. Charles Roepel, mining engineer, of London, is in Nelson, Wash., examining the Silver King mine, it is said, in the interest of the Tharsis Sulphur & Copper Company.

Mr. F. G. Spencer, at present vice-president of the Binford Coal Company, has been selected by President Meck, of the Colorado Coal & Iron Company, to act as general sales agent of the latter company.

Mr. J. Friedenstein, metal broker, of this city, leaves to-day for Europe on the "Etruria," on a business and pleasure trip combined. He will visit England, France and Germany, returning about Aug. 15th.

Prof. Van Hise has charge of a party which is engaged studying the rock formations to the north and west of Ishpeming. Prof. Van Hise is well known as a writer on the geology of Lake Superior iron ore fields.

Mr. John Best, engineer, of Lancaster, Pa., has been appointed the Lancaster agent of the Lidgerwood Manufacturing Company, New York, and will hereafter push the sale of the Lidgerwood hoisting engines in Lancaster and vicinity.

Mr. Pat Doyle, editor and proprietor of "Indian Engineering," has refused to allow a settlement of the suit brought against him by the "Indian Engineer," stating that nothing short of an apology would satisfy him, as the charge was groundless.

The following named gentlemen, mainly mining engineers, were appointed by Mayor Sanderson, of San Francisco, to represent San Francisco as delegates to the second convention of the National Mining Congress, to be held at Helena, Mont., from July 12th to 16th, 1892: John H. Hammond, W. H. H. Hart, William Irelan, Jr., Louis Janin, Thomas Price, A. J. Bowie, T. R. Church, Paris Kilburn, Charles G. Yale, W. H. Martin, Ross E. Browne, John Finlay, W. K. Aldersley, D. T. Hughes, Dr. E. Mellis, W. S. Lyle, Louis Glass, C. A. Luckhardt, Dr. W. D. Johnston, J. F. O'Gorman, R. W. McMurray, A. H. Boomer, J. Z. Davis and N. J. Brittan.

Our contemporary the "Electrical Engineer" has moved into very handsome and commodious offices in the new Mail and Express Building on Broadway and Fulton streets. These offices, occupying the eighth floor of the Fulton street wing, embrace more than 2,000 sq. ft. of floor space, and look out on Broadway, the Post Office, St. Paul's historic church and churchyard, the Western Union headquarters at "195," and the Hudson River. They consist of a large business office, cashier's room, sales desk, subscription department, a beautiful reception room for visitors, president's office, business manager's office, and a suite of three editorial rooms. They are lighted by no fewer than 69 incandescent lamps and connect with the outer world by long-distance telephone. They have also a unique automatic telephone system with eight stations, by means of which various departments may communicate with each other directly, with the result that the dispatch of business is immensely facilitated.

About three years ago the necessity of increasing the equipment of the Department of Mechanical Engineering of the University of Pennsylvania became so apparent that a fund was immediately raised to place the department on an equality with the best schools in mechanical engineering in the country. As the number of students in the Mechanical Engineering Department then was greater than the available space could accommodate satisfactorily, the department began seeking other quarters. College Hall was overcrowded and the only way of obtaining more room was by moving into a separate building. Two buildings are now in process of construction. One building is the Engineering School proper. This building is to be practically four stories high and 100 by 50 ft. on the ground. On a portion of the ground floor will be placed the engines and dynamos for lighting the buildings of the university. The balance of this floor, about 2,000 sq. ft., will be devoted to the purposes of the Mechanical Engineering Department proper. On the second floor will be the remainder of the mechanical laboratory, in which will be installed much of the apparatus now in the laboratory. On the floor above will be located the drawing room—a room covering 2,000 ft. of floor space—the electrical laboratory and photometric room, covering 1,600 ft. of floor space, one class room and the assistant's room. The entire room actually used from day to day in this building for instruction purposes in the Department of Mechanical Engineering will be about 15,000 sq. ft., as compared with about 4,000 ft. in the present quarters.

Lively interest has been aroused by the news that a psychological laboratory is to be started at Yale University. It is said that the laboratory is to consist of ten rooms, making it one of the largest in the country. Among the new features will be a psychometric room to contain a set of tests of the mental condition—memory, sensitiveness, fatigue, emotion, etc.—of the person making them. There will also be a well ventilated and perfectly darkened room for reactions, fitted up in the most comfortable manner and secured from all noises by careful padding. A workshop with lathe will enable the repair and modification of apparatus without the vexatious delays and expense of sending abroad; it is hoped that at some future time this will develop so that a large part of the apparatus can be made at home. Two courses have been announced: (1) A course in physiological psychology on the basis of Prof. Ladd's text-book, illustrated by charts, models, histological preparations and lantern slides (open to both undergraduates and graduates); (2) a course of laboratory exercises and lectures in experimental psychology, in which the methods of experimenting on and measuring mental processes are practically taught (for graduates); (3) special problems for investigation, which are to be worked out by advanced students with every possible help in the way of assistants and apparatus. Time spent in investigation will also be permitted to count for a degree, and the results of successful work can be presented in a thesis for the degree of Ph. D. The establishment of the laboratory is due to the efforts of Prof. Ladd, who, although the instruction in psychology is given over to Dr. Scripture, remains the head of the general department of philosophy, ethics, and psychology.

OBITUARY.

Alexander Willard, United States Consul at Guymas, Sonora, Mexico, and well known to many Western mining men, died of paralysis in the consulate on the 14th inst., aged 67. Mr. Willard was interested himself in mining matters, having charge latterly of the estate of the late Mattias Alsua, in which was included the Trinidad silver mine in which so much English capital was wasted, and a large section of the now promising anthracite fields of Sonora, extending from San Marcial to La Barranca and even outcropping on the eastern synclinal in Chihuahua. These properties Mr. Willard always considered of great value, and his faith in La Trinidad was proved when, on the cessation of work by the English company, it was worked under his efficient direction to a considerable profit. To mining men entering Mexico he was ever cordial and ready with advice, and in many cases with more substantial assistance. He regarded Sonora as a wonderful mining country, and by his indefatigable efforts as well as his reputation for business ability, much capital has been invested profitably in that State. Personally he was of a most genial disposition, and it is safe to say that, regardless of sect or race, he had not an enemy in Guymas, where he had lived for 25 years, and that the whole city will mourn his loss.

SOCIETIES.

The New England Water-works Association held their annual convention at Holyoke, Mass., on the 8th, 9th and 10th June. Papers on subjects interesting to water-works engineers were read by Messrs. F. L. Fuller, G. A. Stacey, J. C. Haskell, J. R. Freeman, J. L. Harrington, B. I. Cook, R. A. Robertson, and T. M. Drown, and there were topical discussions on various subjects. Reports of committees and excursions completed the business of the meeting.

A regular meeting of the Boston Society of Civil Engineers will be held at Wesleyan Hall, 36 Bromfield St., June 15th, 7:30 p. m. The subject for discussion will be "Methods of Tunneling." Walton I. Aims, of New York, will speak on the methods employed in the Hudson River tunnel. His remarks will be illustrated by lantern views. The following members will probably take part in the discussion: H. A. Carson, F. A. McInnes, G. S. Rice and F. P. Stearns.

At the meeting of the Franklin Institute held on the 18th May Mr. W. S. Collins, of New York, read a paper descriptive of the system of using petroleum for fuel purposes, as practiced by the Aerated Fuel Company, of Springfield, Mass., illustrating with the aid of lantern slides the mechanical features of the same. The system consists substantially in the employment of compressed air as the vehicle for conveying the oil to the point of combustion, and spraying it into the furnace. The method permits of the location of the oil reservoir below the level of the furnaces, thus obviating the danger of flooding the latter with oil in the event of accident by leakage or break-down. The secretary presented, on behalf of Mr. Elwood Ivins, a set of specimens of metal tubes of steel, brass, copper and aluminum, among which were a number that were of extremely small diameter, and in lengths of 30 or more feet. These tubes are seamless, without solder or weld, and are made by a process devised by Mr. Ivins.

At a meeting of the Engineers' Club of Philadelphia, held on the 4th June, there was a discussion of several topical questions. Mr. Henrik V. Loss called attention to the fact that while engineers were familiar with the action of other forces upon metals generally, they were yet much in doubt with regard to shearing. He considered hydraulic machinery the only available kind for accurate shearing tests, and described the results of a series of experiments that he had been making, but had not yet completed. From cards which he had taken he found that it requires more power to cut iron than steel of the same dimensions, and less power for both metals than is generally supposed. Mr. John C. Trautwine, Jr., attributed the differences in the behavior of these two metals to the brittleness of steel compared with the tougher iron.

INDUSTRIAL NOTES.

The Columbian edition of the Boston "Commercial Bulletin" is a handsome illustrated issue of 36 pages and a credit to the enterprise and taste of that excellent commercial paper.

The National Tube Works Company has declared its regular quarterly dividend of $1.75 on the preferred and $1.50 on the common stock, payable July 1 to stockholders of record June 18th.

The Reading Coal, Coke, Brick and Tile Company, of Athens, O., has a capital stock of $62,200. Active operations have already been commenced and the company now has a force at work building a mile of railway to connect their mines with the Baltimore & Ohio Southwestern. It is the intention of the company to equip their mines with all the latest improved machinery.

The commission appointed by the Supreme Court to consider the plan of rapid transit proposed by the Rapid Transit Commission handed in its report yesterday to Judge Van Brunt recommending a tunnel at least 11 ft. 6 ins. in height and 11 ft. in width for each track, extending up Broadway and the Boulevard from the Battery to the city line. The motive power will be electricity or compressed air.

Some weeks ago the Virginia Hard Coal Company, of Radford, Va., was organized. It purchased extensive mines near Vickers' Switch, and began active work, preparatory to an active summer and fall campaign for placing orders. Recently a sample of the coal was sent to Prof. Robert C. Price, of the Virginia Agricultural and Mechanical College, at Blacksburg, for analysis. The following result was obtained: Moisture 105° to 110°), .57; volatile combustible matter, 11.87; fixed carbon, 82.19; ash, 5.37.

The Wilkeson Coal and Coke Company are building a bank of 80 ovens at their works at Wilkeson, near Tacoma. Thirty of these will be in operation by July 1st, the balance by Sept. 1st of the present year. This coke, while not equal to Connellsville, Durham or Belgian coke, the latter two of which are brought in sailing vessels to Pacific coast foundries, is equal to many cokes made in the United States, and finds a ready market along the Pacific coast.

Surveys have been adopted to extend the Schuylkill Valley Railroad by the construction of a branch road, one mile long, between Spring City and Royersford, Pa., work to begin at once. The road when completed will cost $110,000. A bridge being required to span the river between the two towns, the span will start from the main line north of Spring City, near the canal bridge, and continue between Royersford and the river, opening up connection with the foundries and factories that line the river bank at the latter place.

The Amalgamated Association of Iron and Steel Workers has received from the Carnegie Steel Company, Limited, of Homestead, Pa., the firm's scale for work in the ensuing year. In the open hearth furnaces the firm calls for a reduction of 19% from the present rate, and in the armor plate department 20% off the old basis. In the plate mill the minimum is reduced from $25 to $22, and in this mill there is also a general reduction of from 15 to 50%. It is thought that there will be no change in the price for puddling. The rate is now $5.50 per ton, and there is little support to a movement to advance it to $6.50.

The West Duluth Furnace Company have brought suit in the Superior Court to recover $30,000 damages from the Lehigh Coal and Iron Company, of West Superior, Minn. The plaintiffs aver that they made a contract with the defendants whereby the defendants agreed at a stipulated price to furnish them with a certain number of tons of Connellsville coke. The Furnace Company asserts that the defendants, instead of furnishing Connellsville coke as per contract, furnished them with an inferior quality, which interfered with and damaged their business to the extent of $45,000.

The current issue of "The Weekly Bulletin of Newspaper and Periodical Literature," published at 5 Somerset Street, Boston, is twice its usual size, containing a classified index of 1,300 articles from recent numbers of the periodical press. The bulletin catalogues the important articles in the leading daily and weekly papers and the monthly magazines of the United States and Canada, including the Engineering and Mining Journal. Its value to readers, writers, and students is sufficiently indicated by its title, and, although still in its first volume, its success as evidenced by the current issue is a surprise to no one acquainted with its plan and purpose.

Samuel F. Hodge & Co., of Detroit, Mich., have adopted the plans of the Berlin Iron Bridge Co., of

East Berlin, Conn., for their new foundry, and have placed the contract with this company for the construction of the building. The general dimensions of the building are 86 ft. in width by 161 ft. in length. On each side there is a wing 23 ft. in width. The center of the building is controlled by a traveling crane with a travel the full length of the building. The wings of the building are controlled by jib cranes, so that when completed every inch of the floor surface will be controlled by power, either from the traveling crane or from jib cranes. The construction will be entirely of brick and iron.

Work has been begun on a tin-plate plant at Ernst Station, in Plymouth Township, Pa., under the supervision of Richard Lewis, manager of the tin manufacturing plant of W. H. Edwards at Morristown, in the Swansea Valley, Wales, and the Mastaede Tin Works, in South Wales. A number of Welsh workmen are erecting the machinery, and a portion of the mill is to be in operation, it is said, within the next six weeks. It will be capable of turning out from 600 to 700 boxes of tin weekly, and the entire mill,when in full operation,will have an output of 150 tons weekly. The mill will be running night and day and will require about 50 men and boys. Mr. Lewis stated that, a few days ago, a representative of E. Morra & Co., operating 22 mills in South Wales, had arrived in this country, and would establish a factory at Elizabethport, N. J.

Carnegie, Phipps & Company are making active preparations at the Homestead Steel Works for the expected contest with their 3,000 workmen. The men have until the 24th inst. to decide whether or not they will accept a scale of wages which, they claim, will reduce their earning capacity from 10 to 40%. They have not formally rejected the new scale, but no person expects them to accept it, and the Carnegie firm is preparing to put non-union men in their places. If this is done it will lead to a most bitter contest. The mills and the ground surrounding, 400 acres in all, are being inclosed with a fence 9 ft. high. Barbed wire, which will be charged with electricity, is being stretched along the top of this, and a covered platform is being constructed from the railroad station to the inclosure. Water plugs and gas pipes are being placed in the inclosure. Mammoth cook houses, dining halls, and barracks in which the men can sleep are being erected, and every arrangement is being made for a long siege.

When aluminum was first produced in large quantities it was predicted that it would have an extended use for the manufacture of culinary utensils and table implements. Of course there were some who doubted this, fearing that the vegetable acids might not only injure the utensils, but might form compounds injurious to the health.. This question, however, has been satisfactorily settled by the investigations of the scientists, among others those of Prof. Lunge, whose researches have been published in the Engineering and Mining Journal. He found that the action of vegetable and other organic acids was extremely slight, and that not only would the utensils last indefinitely, but that no compounds injurious to health are to be feared.

In the manufacture of such instruments the Cincinnati Pure Aluminum Company has taken the initiative in this country, and is manufacturing fancy articles, forks, spoons, cups and other articles, from aluminum ingot 99½% pure. The drinking cups with handles manufactured by them which we have seen, while of more than ½ pint capacity, weigh but 2 oz. or less. They are neatly made, and have, outside of their novelty, much merit considering their strength and lightness. These articles would be especially useful for prospectors and tourists.

The extensive pumping plant for the World's Fair, at Chicago, is to be built by Henry Worthington, of New York, and when completed will be one of the largest pump installations ever made. The plant will be situated on the Exposition grounds alongside of and nearly on a line with Machinery Hall, fronting on the Grand Plaza, extending around the lagoon to the Agricultural Building. The station is a fireproof building, constructed of brick, and is the only building of this nature (excepting the Art Galleries) on the grounds. The architecture is decidedly classic, and the ornamentations of the most artistic character. There will be on the exterior ten medallion portraits in bas-relief of eminent engineers, all of whom are deceased. The names selected for this distinguished honor are: Messrs. Chesborough, of Chicago; Kirkwood, of Brooklyn; Craven, of New York; Simpson, English hydraulic and M. E.; Jarvis, original Croton aqueduct engineer; Whitman, of St. Louis, and Graff, of Philadelphia. The pumping plant will consist of one 15,000,000 compound vertical high duty engine, one 10,000,000 compound horizontal high duty engine, one 7,500,000 triple expansion vertical beam engine, and one 5,000,000 horizontal high speed triple expansion engine. The steam is taken from the main boiler plant, which is located just back of the pumping station and alongside of Machinery Hall. These engines are calculated to work against a fire pressure of about 100 lbs., but the arrangement is such that only in case of fire is this pressure maintained, as it is very much reduced for the use of the fountains and other demands of this character. The water is taken from the lagoon and is not suitable for potable purposes. This latter supply is taken from the city mains that are run into the grounds from the Hyde Park pumping station, where are located Worthington, Holley and the old Gordon-Maxwell engines. Space has been reserved in the second story of the building for reception rooms, and it is intended during the time of the Exposition to make this in some sense an engineers' headquarters and to receive friends who may attend the Exposition. In addition to this pumping plant there will be located on another part of the grounds, not yet fully decided upon, a Worthington low service engine of 8,000,000 gallons capacity, which is designed to take care of the surface drainage. In the boiler room will be a separate plant of Worthington pumps feeding the high pressure boilers, working against 150 lbs. pressure. The above constitutes very nearly all the pumping machinery that will be in practical use during the Exposition on the grounds.

The Cumberland Tin-Plate Company, Cumberland, Md., has ordered a full equipment of machinery for a tinning department, from the Lewis Foundry and Machine Company, and the Union Foundry and Machine Company, of this city. The investment in the plant and additions, it is estimated, will aggregate $300,000. The equipment will have a capacity for an output of 5,000 boxes of plates a week.

A meeting af the scale committee of the Amalgamated Iron and Steel Association and the representatives of the manufacturers of the Pittsburg district was held at Pittsburg, Pa., on the 15th inst. President Weihe, of the Amalgamated Association, presented for signature a scale prepared for the convention to regulate next year's wages. The price of puddling was left at $5.50 a ton. The principal changes are as follows: In the wire rod mill scale the price per ton for rolling from 4-in. billets is reduced from 45 cts. to 30 cts. The remainder of the scale is unchanged. There is a heavy cut in the "angles" scale. In the 1¼ × 3-16 size the reductions are: Roller, from $1.60 to $1.50; heater, reduced from 80 cts. to 75 cts.; rougher and catcher, each from 40 cts. to 35½ cts. In this mill the second extra is altered to read as follows: All angles of unequal sizes shall be divided; for instance, 1¼ × 1 ln. (instead of ½) shall be classed with 1⅛ (instead of ¼) angle. In the hoop and cotton tie mill scale an important change has been made, which is in part a concession to the manufacturer. No. 2 note will read: 410 bundles will constitute a day's work for 3-turn mills (instead of every turn), except Saturday, and on Saturday 475 bundles for 2-turn mills, and single turn 400 bundles. Under the old scale 325 bundles on Saturday constituted a day's work. In the plate and tank mills scale under the old list gauges 10 and 11 received 20 cts. per ton above common prices; gauges 12 and 13, 30 cts.; gauges 14 and 15, 40 cts., and gauges 16 and 17, 50 cts. These extras are stricken out, and by this the rollers and heaters bind themselves to work these extra sizes without extra compensation. Mr. McCutcheon, on behalf of the manufacturers of the Western district, presented a scale with the following changes: That puddlers' wages be reduced from $5.50 to $4.50 a ton; bar mill rollers to be reduced from 70 to 50 cts. a ton; heaters the same; catchers from 43¾ to 31¼ cts. a ton. In the groove skelp iron department the manufacturers asked that rollers be reduced from 70 to 40 cts.; heaters from 70 to 50 cts., and catchers from 43¾ to 25 cts. a ton. Reductions in the guide mill were also proposed. a cut from $2.90 to $2.18 being made. For scrapping and busheling, the manufacturers want a $2.25 rate instead of $2.75, as paid at present. For skelp iron, or guide mills, rollers are to be paid 85 cts., and of this amount are expected to pay their helpers. This year rollers in this department have been paid $1.45. Heaters are reduced from 72½ to 50 cts., and roughers and catchers from 36¼ to 25 cts. a ton. These rates hold good for rolling skelp iron on 10-in. and guide mills. A reduction in the plate mill rollers' scale is proposed by the manufacturers from 72 to 50 cts., and heaters from 80 to 58 cts. In the structural mills, 20-in. rollers are cut down from 70 to 43 cts., and are expected to pay their helpers. In this particular branch heaters are reduced from 70 to 46 cts. Other mill hands are reduced in proportion. This scale, as presented by the manufacturers, also holds good in the 18-in. mills. On the 16th the manufacturers of the Mahoning and Shenango Valleys submitted their scale. It provides a cut of $1 per ton for puddling, but otherwise the reductions are not as heavy as those in the Pittsburg scale. According to the Pittsburg papers it is a foregone conclusion that the delegates to the association will refuse to submit to the changes, the magnitude of which was altogether unexpected. Unless both sides concede several points serious trouble will ensue. At the present time neither side shows any inclination to yield in its demands.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

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

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

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

All these services are rendered gratuitously in the interest of our subscribers and advertisers the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

2703. A dynamo with a capacity of 30 to 40 incan descent lights with all necessary fittings, lamps, etc Arkansas.

2704. A 25-H.P. return tubular boiler, half-arch front, all fixtures complete. South Carolina.

2705. Three hundred feet of bridge in 2, 3, 4 or 5 spans. Must be in good order and built to carry engine weighing 40 tons on 12-ft. wheel base and train of 60,000-lb. loaded gondola cars. Ohio.

2,706. Wrought iron highway bridge 70 ft. clear span and 14 ft. roadway, to weigh from 11,000 to 12,000 lbs.; state price f. o. b. works. South Dakota.

2,707. 3,000 ft. second-hand 12-lb. T-rails. New York.

2,708. Second-hand diamond prospecting drill, to go 1,000 ft.; 1 to 1¾-in. core. New York.

2,709. Second-hand Hoskins assay outfit. New York.

2,710. A riveting machine for splicing cotton hoops together. North Carolina.

2,711. A full outfit for a planing mill with a capacity of 25,000 to 30,000 ft. per day; also boilers, engine, dry kilns, etc. Pennsylvania.

2,712. A 48-in. swing lathe for turning and boring pulleys. Virginia.

2,713. Engine, boiler, elevator, heating apparatus, etc. Tennessee.

2,714. A 6-H. P. threshing outfit, consisting of a 6-H. P. mounted engine and separator, or mounted 6 horse sweep power and separator. North Carolina.

GENERAL MINING NEWS.

ALABAMA.

Tennessee Coal, Iron and Railroad Company.—At the meeting of this company on the 16th inst. the sale of the De Bardeleben Coal and Iron Company, on the terms published in this journal some time ago, was confirmed. The meeting is said to have been entirely harmonious. The purchase of the Aldrich property, a coal prdoucer, came up for consideration and was laid over until the following day. At this second meeting a few of the minor details relative to the Tennessee and De Bardeleben consolidation were to have been adjusted.

ARIZONA.

Gila County.

Old Dominion Copper Company.—According to a late issue of the Globe "Silver Belt" the product of this company in May, with three furnaces in blast most of the time, was 1,014,000 lbs. copper, which is the largest output in one month ever made by the company. A little more than 6,000 tons of burden was put through the furnaces. Consequently the product was only 8 4-10% of the burden. The significance of this showing, adds the "Silver Belt," lies in the demonstrated efficiency of the plant and ability of the company to work successfully ores averaging as low as 8% in copper. Much new ground has been recently opened in the Alice claim, where two winzes are being sunk from the tunnel, one in ore and the other showing strong indications of it. Notwithstanding the heavy draft upon the ore bodies during the past month, the supply of ore is now larger than ever, and constantly increasing.

CALIFORNIA.

Mono County.

The following statements of financial condition on the 31st ult. have been filed by Bodie companies: Cash, Bodie, $1,351.95; Bulwer, $12,408.05; Mono, $4,806.69; Standard, $39,547.47; Syndicate, $1,650.36.

Bodie Consolidated Mining Company, Bodie.—At this property some fair grade ore continues to be found in the south drift from the upraise from the 400-ft. level.

Mono Consolidated Mining Company, Bodie.—The latest official letter from this property is as follows: The seam of ore in the upraise from the east crosscut, 600 level, holds very good, but is small. We are putting in the pans and settlers at the mill and are overhauling the machinery in general. We are putting in a plunger pump on the 700-ft. level. We shipped on the 3d inst. bullion valued at $14,373.96.

(From our Special Correspondent.)

Standard Consolidated Mining Company, Bodie.—A shipment of bullion has been received from the mine valued at $20,060.23.

Placer County.

(From our Special Correspondent.)

Gray Eagle Mining Company, Forrest Hill.—The mill will start up on accumulated ore about Wednesday next.

Shasta County.

Morton & Bliss.—These properties have been sold to Messrs. Weil and Barney for $150,000. The new proprietors will start the 10-stamp mill and add sev-

eral new Huntington mills to the works. These mines are located near Squaw Creek, and while showing good surface indications have not been worked to any profit.

San Diego County.

(From our Special Correspondent.)

A meeting of the San Diego Chamber of Commerce has been held for the purpose of transferring the $200,000 subsidy for the erection of an iron smelter on the bay. The sum was raised some time ago to be given to Dr. J. C. Eames and other Pittsburg people upon the enterprise then projected being completed. The transfer is to be to a new company that contemplates the erection of a plant for working iron ore from Tempustete, Lower California, at San Diego. An English syndicate owns the mines.

Sierra County.

Bald Mountain Extension Drift Mining Company, Downieville.—This company has declared dividend No. 19 of 10 cts. per share, or $6,000. The aggregate clean-ups of the mine for the past month, 24 working days, and a like number of gravel pickers, were 864 oz. and 17 pwt., or $16,068.83.

Orange County.

Frabuco Gold Mining Company.—This company is located in Orange County. There are 4 quartz claims and a good mill site, with water and fuel in abundance. The veins range from 18 ins. to 4 ft. in thickness.

COLORADO.

Dolores County.

Enterprise Mining Company.—The Enterprise company has commenced sinking for a second contact. To that end the Jumbo shaft will be relined, a derrick 45 ft. high erected, and the engine and boiler overhauled. For a long time it has been the opinion of many who were thoroughly acquainted with the formation on this hill that the chances were favorable for another contact at a lower depth. Every indication points to the fact, says the Rico "News," that following down the rich vertical veins will eventually bring them to a much richer contact than the one already encountered. Past history has proven that in a contact formation the second strata always proves larger and better than the first. Progress of this work will be watched with interest, and the sinking of ore in this work means many more shafts of the same character. The company are prepared to sink to any desired depth, and will do so in order to thoroughly prospect the ground.

Pitkin County.

In compliance to the urgent demands of the mines at Aspen, the following ore rates have been made: Ores from Aspen not exceeding $30 per ton in value, to Denver and Pueblo, $5 per ton; ores not exceeding $30 per ton in value, to Leadville, $3 per ton; ores to Denver and Pueblo over $30 in value and not exceeding $45 per ton, $6 per ton; to Leadville, $3.50; ores to Denver and Pueblo over $45 per ton and not exceeding $100, $8 per ton; to Leadville, $4; ores to Denver over $100 per ton and not exceeding $200, $10 per ton; to Leadville, $5. The cheapest rate is $5 per ton to Denver and Pueblo on ore that does not run over $30 per ton. Smelter returns must be exhibited and freight settled by them.

IDAHO.

Alturas County.

Solace.—The sale of a one-third interest in the Solace mine for $40,000 cash has been closed. The purchasers are stockholders in the Standard Oil Company. This sale leaves Mr. Johnston and Littleton Price owners of two-thirds of the Solace property, says the Hailey "Times." The Solace group was bonded, about two years ago, by C. J. Johnson from J. B. Haggin, for $40,000.

Logan County.

Prairie Belle.—This mine, which shows a vein of rich ore, has 200 ft. of tunnel—180 ft. cross-cut, the last 20 ft. following the course of the ledge which it taps at a depth of 60 ft. Width of ore body, from 18 ins. to 2 ft. A quantity of ore shipped to the Hailey sampler yielded $57 per ton in gold, according to the Hailey "Times."

Texas Star.—A tunnel 200 ft. in length has been driven in this property, 50 ft. following the course of the Star ledge. The continuation of the tunnel is a cross-cut to reach other ledges which crop out within the exterior boundaries of this claim. The ledge shows a 5-ft vein between walls, and carries from 28 ins. to 3 ft. of free gold quartz.

Owyhee County.

Dempsey.—The cross-cut has opened a vein 2 ft. wide, 6 ins. of which is good ore. Drifting is now going north on the vein.

Trade Dollar.—Tunnel No. 1, ledge 4 ft. wide, stoping, 12 ins., $150 ore. No. 2, ledge 4½ ft. wide, 2 ft. $100 ore. No. 3, ledge 5 ft. wide, 2½ ft. white mealy quartz which assays $276.50, and 18 ins. rich talc. Recent developments in No. 3 show that the company has never had the true ledge until lately, says the Idaho "Avalanche." A body of quartzite splits the ledge and the main body of ore lies on the east side, while the former work has all been done on the west side of the belt of quartzite and that taken for the foot-wall. This tunnel was expected to cut winze C, but the course of the vein has thrown it several feet east of this winze, and they will now have to cross-cut to make connections. Winze C: Stoping, ledge 4 ft. wide, 12 ins. $300 ore, 6 ins. shipping ore. Work has begun on the new mill.

Shoshone County.

Coeur d'Alene Strike.—According to F. R. Culbertson the strike is about over. He says in an interview that the Bunker Hill and Sullivan are now working 187 men, the Sierra Nevada 50, and the Frisco mine 70 miners. The Tiger will start as soon as enough non-union men are secured, which is only a matter of a few weeks, for unions are fast breaking up and will soon be entirely demolished. Mr. Emery, superintendent of the Union mine, says "that he has 70 men now mining, just as many as he is prepared to put on presently."

KANSAS.

Cherokee County.

During the week ending June 11th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 1,729,790; rough ore, pounds sold, 1,276,050; zinc ore, pounds sold, 484,940; lead ore, pounds sold, 198,160. Sales aggregated a total value of $10,333.

MICHIGAN.

Gold.

South Beaver.—The shaft is down 100 ft. and is still showing a vein of 2 ft. in thickness that carries free gold in satisfactory quantity. They are hastening the work of exploration as rapidly as possible, which is slow at best, as the drilling is done by hand, and the ground is hard, says "Iron Ore."

Copper.

(Special by Telegraph.)

The surface works at this mine burned down on the 15th inst. The boiler house and ore bins and crushers are a complete loss, with little or no insurance.

(Special by Telegraph.)

Calumet & Hecla Mining Company.—The No. 2 rock house, the finest in the Lake Superior region, started work on the 14th inst.

Lac La Belle Mining Company.—It is reported, says the Calumet "News," that this company will probably do some mining work in the near future. It seems to be the general opinion among miners and mining men, that the company possesses a valuable property, and from the important indications it appears evident that a large ore body exists somewhere in this vicinity. A careful examination, with some development work, may reveal one of the great mines of the peninsula.

Osceola Mining Company.—A consultation between striking trammers and officials of the Osceola mine took place June 14th. The officials agree to give the strikers $50 for 26 shifts, six shifts each week, also to discharge the objectionable boss. They would not return the men first discharged. The miners went down last night, but the trammers did not agree to work and may attempt to prevent the miners from going down to-day, in which case State troops will be called out. The company refused to take back 12 of the leaders. Later reports by special telegraph to us state that the trouble is now over, and that the night trammers have gone to work.

Tamarack Junior Mining Company.—The No. 2 shaft is now down 15 to 20 ft. below the lode, and a cross-cut to the west will soon be commenced, says the Calumet "News." In the length of the shaft the lode widened from 6 ins. to 6 ft. The drifts from No. 1 shaft and the stopes in them are looking well, particularly the third and fourth levels. The levels going south from No. 1 are as follows: 1st, 50 ft.; 2d, 60 ft.; 3d, 350 ft.; and 4th, 130 ft. On the north side No. 1 is in about 50 ft.; Nos. 2 and 3, 300 ft. each, No. 4, about 130 ft. It should be understood that the No. 1 shaft is sunk in about the center of the south forty, and No. 2 about half-way up the second forty, but further west than No. 1. It was intended to strike the lode in the No. 2 shaft at the 7th level of No. 1, but owing to the lode not having been struck exactly at the depth supposed, it will now, perhaps, be nearer the 8th level. As the levels run parallel with the outcrop and the 2d and 3d levels going north are both in such good ground and in 300 ft., it would look as if the western part of the second forty would, unless the lode dips to the north much quicker than calculated upon, encounter the good shoot of ground as depth is attained in the No. 2 shaft. As the Centennial No. 3 shaft will enter the Tamarack Junior ground a little distance north of the southeast corner of the north forty, the Tamarack Junior shaft will virtually explore all the Centennial ground, except the northwest portion of section 12. The Osceola mill has started on the ore from this mine.

Iron.

A new ore classification and price list for the season of 1892 has just been put out by the Western Ore Association. The prices are substantially the same as in last year's list. No. 1 Bessemer hematites are advanced from $4.25 to $4.50, and there are two or three grades, heretofore in a general class, that are now quoted separately. The list is as follows: Republic & Champion No. 1, $5.50; Cleveland & Lake Superior specular, No. 1, $5; Chapin & Menominee No. 1, $4.25; soft hematites, No. 1 non-Bessemer, $3.75; Gogebic, Marquette and Menominee No. 1 Bessemer hematites, $4.50; Minnesota No. 1 Bessemer, $5.65; Minnesota and hard Bessemer hematite (Chandler), $4.85; Lake Superior and Lake Angeline extra low phosphorus Bessemer, $6. This last special grade, of which only a limited quantity is mined, is quoted separately for the first time; the same is to be said of the Minnesota hard Bessemer hematite, heretofore classed with No. 1 Bessemer hematites, and of the Minnesota No. 1 Bessemer, $5.65, heretofore classed with Republic and Champion No. 1.

Iron—Gogebic Range.

The iron mines within the limits of the city of Ironwood, Wis., are assessed as follows: Norrie, $1,965,000; East Norrie, $540,000; Pabst, $300,000; Ashland, $813,000; Aurora, $1,229,000; Newport, $415,300.

Iron—Marquette Range.

Cleveland Iron Company.—About 25 surface hands were laid off at the Cleveland hard ore mines the latter part of last week, says the Marquette "Mining Journal." From the present outlook of the ore market it is probable that the hard ore workings of the mine will be closed down for an indefinite period. Mr. Mather was here last week for a few days, and left for Cleveland Saturday. On his arrival at Cleveland he will consult with other officials of the company, and the decision they arrive at will be made known here in a few days. By the closing down of the hard ore mines about 400 men would be thrown out of employment. The company could probably retain some of the men, putting them to work at other portions of the mine, but most of them would have to find work elsewhere if the proposed curtailment of operations goes into effect.

Jackson Iron Company.—The ground over the drift running southward under the hill from pit No. 8 of the Jackson mine caved in, leaving an immense oval-shaped hole about 40 ft. deep and 60 or 70 ft. across at the widest point, says the Ishpeming "Daily Press." The drifts had been worked out last year, and the only work prosecuted there since was by scrammers during the winter.

Lucky Star Iron Company.—A diamond drill will be employed upon this property in a few days. There is already a drill hole here to a depth of 350 ft. This will be continued until the company is satisfied that there is no ore in its track. They are encouraged to resume operations here by reason of the developments being made in the Queen mine of the Buffalo Mining Company, located a short distance to the east, which shows the ore to be pitching toward the Lucky Star.

MISSOURI.

Jasper County.

There are indications that the lead and zinc industries of the State are about to pass under the control of foreign capital. John D. Rockefeller recently looked over the ground. His plan, it is understood, is to obtain control of the best part of the property and its output, as well as the product of the smelters, for a proposed trust that has for its object the controlling of prices in lead ore and "jack."

(From our Special Correspondent.)

Joplin, June 13.

The mines opened up one week ago under the most favorable conditions of the weather, and the pumps were run to their full capacity, so that the miners were able to resume work. There was no large output of ore, but the sales fell below the average on account of the ore buyers being inclined to lower the price. The top price paid for zinc ore was $27 per ton, and the average of the district was $25.50. Lead ore declined 50c per thousand, and closed at $24. Following are the sales from the different camps: Joplin mines, 1,150,350 lbs. zinc ore and 251,090 lead, value $20,405.50; Webb City mines, 133,580 lbs. zinc ore and 40,340 lead, value $2,550.95; Carterville mines, 1,788,500 lbs. zinc ore and 252,230 lead, value $29,109.10; Zincite mines, 35,090 lbs. zinc ore and 3,430 lead, value $521; Carthage mines, 231,150 lbs. zinc ore, value $2,888; Oronogo mines, 132,620 lbs. zinc ore and 77,470 lead, value $3,146.75; Galena, Kan., mines, 484,940 lbs. zinc ore and 198,160 lead, value $10,333; district's value, $68,954.30. Aurora, Lawrence County, mines, 252,000 lbs. zinc ore, 544,550 lbs. silicate and 210,000 lbs. lead, value $11,588. Lead and zinc belts' total value, $80,542.30. This sale of ore is about $20,000 short of the output for the week, as a number of the large producers held their ore for an advanced price. The Rex Mining and Smelting Company, at Joplin, have not less than 125 tons of ore in their bins from last week's run. The Standard Lead and Zinc Mining Company, at Zincite, sold their ore at $27 per ton, but did not deliver. The outlook for the coming week is favorable for a very large output, and with fair prices the sales will be large. Mr. W. M. Leckie, of the Joplin Machine Works, who has the contract for removing the caved ground at the Troup mines and recovering the bodies of the three men buried in the cave, is now making rapid headway, as the sides of the caved ground have settled down. Messrs. Hemingway and Webster, of the Webster Mining Company, and the Regina Land and Mining Company, have just opened up an office in the Opera House block. This company is made up of a St. Louis syndicate, and are operating the Daisy mine on the Empire Zinc Company's land, and the Columbian Mining Company on the Rex Mining and Smelting Company's land; also 20 acres on the Oswego Mining Company, and the Regina Land and Mining Empire Zinc Company's land, is now well developed, and shows a large deposit of lead and zinc ore. Capt. Hemingway had an electric light system put

in this mine, so that the entire underground works are well lighted up. The company are just now making arrangements for putting in a concentrating plant.

MINNESOTA.

Vermilion Range.

An outcropping of specular hematite has been found on two of the south forties of the Nebewa in section 7, 61-14, and the samples have been sent to be assayed, says the Vermilion "Iron Journal." Active preparations are soon to be commenced.

Germania Iron Company.—Secretary Noble has decided in the Warren case that the Chippewa scrip was not assignable and that any location made by a purchaser of it is invalid. The land in question is known as the Hyde 40 and belongs to the Germania Iron Company.

Ohio.—This mine has bottomed another pit in ore about 250 ft. east of their main pit, where they have 45 ft. of purple hematite. Ore was encountered in the new pit at a depth of 20 ft., and at last accounts they were in it 9 ft. and still sinking, according to the Vermilion "Iron Journal." This gives the Ohio's section 9 location three excellent pits of ore.

Sheridan Iron Company.—The diamond drill that was to cross-cut the vein at this mine has been moved. The formation was so broken that drill work was impossible. The drill had been boring in soapstone and ore.

Wallman Iron Company.—The management of this mine has just completed a fourth shaft in the hanging wall to the east of the other workings, reports the Vermilion "Iron Journal." After sinking through 60 ft. of capping and slates, the ore vein was encountered, as was expected, and figuring from the other shafts shows the Mallman vein to have a dip of about 20°. The result is very satisfactory and confirms the claims made by the company as regards the extent of the vein. Although only from 60 to 63% has heretofore been claimed for the Mallman ore, recent assays have given even higher.

Mesaba Range.

Iron.

Biwabik Iron Company.—The recent exploratory work at this mine has shown that the first ore to be shipped from the mine will be a cargo that will assay from 68 to 69% in metallic iron, and from .008 to .02 in phosphorus, says the Mesaba Range "News."

Chicago Iron Company.—A large body of high grade ore has been recently discovered on the property of this company, says the Mesaba Range "News." It covers an area a mile and a quarter north and south and the same distance east and west. Assays of ore taken from both the east and west ends of the property the latter part of this week average 66.45 in metallic iron, 3.30 in silica and .049 in phosphorus. The ore on this property will be easily mined, the surface averaging not more than 18 ft., while the capping is but 20 ft.

Minnesota Iron Company.—The annual meeting of this company at Duluth resulted in the election of the following directors: Marshal Field, H. M. Flagler, D. O. Mills, Henry Siebert, Benj. Brewster, R. P. Flower, J. C. Morse, H. H. Porter, H. R. Bishop, E. H. Bacon and P. H. Kelly. The company will mine about 550,000 tons of iron ore this season. Two steel steamers of 3,000 tonnage each will be completed in July, making eight in all. The Duluth & Iron Range Railroad, practically owned by the company, elected: President, J. L. Greatsinger, vice M. J. Carpenter, resigned. The 18-mile spur on the Mesaba range will be completed this season and may ship ore. The third ore dock at Two Harbors is about completed.

Ohio Mining Company.—This company has leased to James Sheridan and John B. Weimer the west half of northwest quarter of section 9, town 58, range 17. The terms of lease are that Messrs. Sheridan & Weimer shall mine at least 150,000 tons of ore annually, and pay a royalty of 65 cts per ton. The ore at this mine is very high in metallic iron and low in phosphorus, and it is estimated that at least 1,000,000 tons of ore are in sight.

Penn Iron Company.—It is reported that this company will soon suspend operations at its No. 3 shaft at East Vulcan. This is not because of lack of ore, but because of the lack of demand for the grade of ore produced. This, with the suspension of shipments of Pluto ore from the West Vulcan, will make a difference of 25,000 or 30,000 tons in the year's output.

MONTANA.

Cascade County.

Great Falls Smelter.—It is reported that this smelter will soon resume operations, an arrangement having been made with the Great Northern R. R. which will save from $2 to $3 per ton freight from Neihart and Baker.

Deer Lodge County.

Bi-Metallic Extension Mining Company.—The work of cross-cutting on this property is still pushing to the north with all possible speed, says the Philipsburg "Mail." Owing, however, to the character of the rock encountered, the distance made this week is not as great as that of last week. The management, however, is perfectly satisfied with the work done, and is more confident than ever in the future of this property.

Puritan.—The new owner of this mine has been getting in machinery during the past two weeks and has it about all in position to continue sinking. There is already quite a ledge of ore in sight, which with more working is likely to develop into a big body. Some of the pieces taken from this property contain native and ruby silver.

Lewis and Clarke County.

Golden Crown.—The Montana Mineral Land Development Company, whose object is not to work mining properties, but to secure bonds on promising properties, develop and sell them, have just arranged the sale of the Golden Crown group to capitalists of Portland, Me., says the Helena "Independent." Mr. Horatio Height examined the property for the purchasers. The price is $40,000 in cash and a share in the stock. The Portland people have organized a company with a capital of $1,000,000 in $2 shares, to operate the mines. The president of the company is J. W. Bennett, a spool manufacturer.

Rimini.—Ore shipments have assumed considerable activity this week, there having been shipped to the East Helena works two car-loads from the Macawber mine and one from the S. P. Bassett. The snow is nearly out of the mountains and the roads will soon be settled, when shipments will materially increase, there being a great quantity of ore on the dumps of the mines in the Ten Mile district, ready to be shipped under favorable circumstances, says the Helena "Daily Journal."

Madison County.

Easton.—It is reported by the Helena "Journal" that the men working in the lower, or No. 1, tunnel have tapped a vein of very high grade ore over 5 ft. in width. This vein, like all others found in the Easton, is well defined, cuts square across the formation, and stands almost perpendicular.

Meagher County.

Florence Mining Company.—The Florence mine, at Neihart, is steadily coming to the front and bids fair to become one of the first properties of the State, says the Neihart "Husbandman." During 1891 a surplus of $5,000 was accumulated in the treasury above the working expenses, and yet only development work was done. The ore during this time netted about $48 per ton. The number of tons worked from this property up to date is 500 and its value 40,000 oz., being an average of 80 oz. per ton. During 1892 a shaft has been put down 100 ft. below the main tunnel and levels are being run. The ore stratum has increased in width from 8 to 14 ins., and instead of yielding $48 per ton, which was the average for 1891, now yields $197, a handsome increase, and ore that will yield over 400 oz. is now being reached in the lower level.

Montana Gold, Silver, Platinum & Tellurium Company.—This company, says the Helena "Daily Journal," has shipped two cars of ore, containing 36 tons, which will give the company a net return of over $20,000.

Park County.

Mamie Mining Company.—The Mamie Company have completed all arrangements for a 5-stamp mill, and are at the present time only awaiting the decision of the electric company representatives, now in the camp, their decision affecting the company only on the question of motive power, and if unfavorable an engine and boiler will be purchased in addition to the mill, and steam will be the motive power. In either case the mill will be on the Mamie and running at an early date this summer, says the Park County "Pioneer." The present officers of the Mamie Mining Company are A. D. Sidle, president; F. W. Sorby, vice-president; George P. Urner, secretary and treasurer.

NEVADA.

Elko County.

The following statements of financial condition on the 31st ult. have been filed by Tuscarora companies: Indebtedness, Belle Isle, $12,662.58; Commonwealth, $28,446.59; Del Monte, $21,239.03; Diana, $561.36; Grand Prize, $7,539.80; Independence, $150.46; Navajo, $21,504.86 (with $1,630.75 in unsold bullion, and $12,800 due on pumping accounts as offsets); Nevada Queen, $6,001.49 (with bullion shipments on the way); North Belle Isle, $20,600.85; North Commonwealth, $7,841.15.

Eureka County.

(From our Special Correspondent.)

Eureka.—During the month of May 1,505 tons of ore passed over the E. & P. Railroad in transit to Salt Lake for treatment, as follows: From the Diamond mine, 455 tons; Eureka Consolidated mine, 253 tons; Richmond mine, 166 tons; Hamburgh mine, 164 tons; Phenix mine, 32 tons; Jackson mine, 30 tons; California mine, 20 tons; Eureka tunnel, 15 tons; Delaware mine, 15 tons; Summit, 15 tons; Silver West mine, 15 tons; Antelope mine, 13 tons; General Lee mine, 5 tons; miscellaneous, 8 tons, and Dunderberg mine, 75 tons. From White Pine County 212 tons, and Nye County 12 tons. The shipments would have been heavier during May but for heavy snowstorms which caused delays in hauling in the early part of the month.

Diamond Mine, Eureka.—The new hoist will be in operation in the lower tunnel in a week or ten days from the date of this writing. An immense cave, the biggest yet discovered in the mine, was struck 300 ft. below the tunnel level, but the quantity of ore it contains, although known to be great, cannot yet be estimated. It was discovered last January, but kept very quiet. A single block of steel galena found in it is estimated to weigh 12 tons and to assay about $200 per ton. The mine has undoubtedly passed beyond the experimental stages. The owners have expended about $200,000 in the purchase of mines and mining locations, machinery and erection of buildings, and have got back about $120,000 of that amount (current expenses being paid), from the net receipts from ore sales. It is understood that in three or four months from now the company will run out a regular "stream" of ore and the shipments will be very largely increased.

Idaho Company, Eureka.—The Holly mine has been leased. There is plenty of ore around the old stopes to pay wages, and a vein of ore has been struck 60 ft. below the surface having a thickness of 18 ins. to 2 ft. The lessee states that the ore will range from the lowest paying figures up to 50% lead and 56 oz. per ton. The gold product will be slight.

Richmond Mining Company, Eureka.—The Hoosac mine has been leased to two men, who will first jig the dump and afterward the waste rock in the old stopes of the mine. They will afterward prospect the mine for all they can find in it.

Storey County—Comstock Lode.

The following statements of financial condition on the 31st ult. have been filed by Comstock companies: Cash, Alpha, $13,541.57; Alta, $15,192.25; Andes, $18,554.37; Best & Belcher, $10,304.75; Consolidated California & Virginia, $1,157.61 in cash and $15,705.17 in unsold bullion on hand May 31st, and $60,000 to $70,000 in bullion estimated to be received; Crown Point, $22,258.58; Caledonia, $6,706.33; Consolidated New York, $4,424.81; Exchequer, $9,644.04; Hale & Norcross, $14,968.17 in coin and $7,547.46 in unsold bullion; Julia, $6,892.20; Kentuck, $3,063.93; Lady Washington, $6,965.91; Mexican, $1,168.52; Occidental, $12,194.58; Silver Hill, $6,000.76; Savage, $6,256.84; Segregated Belcher, $10,987.63; Sierra Nevada, $8,335.59; Utah, $1,643.45. Indebtedness: Belcher, $4,410.62; Bullion, $12,913.64; Consolidated Imperial, $3,242.30; Challenge, $7,288.41; Confidence, $1,861.47; Chollar, $19,649.74; Gould & Curry, $753.73; Ophir, $16,957.12; Overman, $17,949.29; Potosi, $14,343.30.

Alta Mining Company.—The Alta mine closed down entirely on the 1st inst.

Occidental Consolidated Mining Company.—The Occidental mill has started up 10 stamps on Occidental ore. The average battery assay was $24.51 per ton. A working test of 100 tons of ore will be made soon in the arrastra. The revival of work at the mill and mine has necessitated the putting on of a large force of extra men. Superintendent Kinkead expects to save 80% of the ore worked. Some important explorations are to be made from the south branch of the Sutro tunnel in the old St. John ground.

Overman Mining Company.—The total product for May was $15,600.

Potosi Silver Mining Company.—The following is the latest official weekly report from this mine: We are repairing the Werrin shaft from the surface to the 200 level. The south drift from winze, 1,150 level, is out 60 ft.; face in quartz and porphyry. The south winze, 20 ft. south of winze connection, 1,200 level, is down 21 ft. In the bottom there are 3 ft. of ore that gives low assays. The joint bullion winze is down 347 ft. below the 1,500 level; bottom in low grade quartz. Extracted and sent to mill in the past week 380 1,600-2000 tons of ore from the 930, 1,100, 1,150 and 1,250 levels. Milled during the week 415 tons. On hand at mill, 46 800-2000 tons; average battery assay, $19.66. Average car sample assays, $23.69. Sent to Carson 430½ lbs. of crude bullion.

Savage Mining Company.—The latest report from this company says: During the week we have hoisted 621 cars of ore from the 950, 1,100, 1,400 and 1,450 levels; shipped to the Nevada mill 525 tons and milled 525 tons; average car sample assay $24.42; average battery assay $20.95; bullion yield for the week $7,696.50. We are doing the usual prospecting and repair work on the several drifts. In the northwest drift 1,400 level at a point 100 ft. north of our south boundary the ore body shows a width of three square sets of fair grade ore. The joint upraise with the Gould & Curry from the Sutro tunnel level is now advanced 68 ft. Top is in quartz giving low assays.

Segregated Belcher & Mides Consolidated Mining Company.—At the annual meeting of this company on the 7th inst. 65,186 shares were represented and the following directors and officers elected: Thomas Anderson, president; H. M. Levy, vice-president, and W. H. H. Hart, Herman Zadig and E. B. Holmes; E. B. Holmes, secretary, and S. L. Jones, superintendent. The secretary's financial statement showed a credit of $10,987.63.

(From our Special Correspondent.)

Chollar Silver Mining Company.—The motion of M. W. Fox, made before Judge Hibbard, that he be made a party plaintiff with Theodore Fox in the suit against A. K. P. Harmon, W. E. Sell, A. W. Rose, Jr., C. T. Bridge, J. Marks, Alvinza Hayward, W. S. Hobart (dead), the Nevada Mill and Mining Company, and the Chollar Mining Company, was granted without any opposition. If Messrs. Fox and Sieberst had the intention they are credited with having had, of repeating the tactics by which they received pecuniary consideration for dropping the suit

against the Gould & Curry Company, they must feel rather sore at thus being debarred from picking a thousand or two from the mill ring. M. W. Fox is scarcely likely to compound what is in reality a felony, as has been shown in the Hale & Norcross case. The present suit is similar to the one concluded a couple of weeks ago. The milling company are charged with having crushed 100,000 tons of Chollar ore, for which it overcharged to the amount of $500,000, and furthermore realized by means of the "Little Joker" the sum of $125,000. While the suit is similar in its nature to the Hale & Norcross suit, it is not unlikely that when the history of the Nevada mill (Chollar) is investigated the exposure of the fraudulent methods practiced by the mill ring will be more apparent than before. It is alleged that Messrs. Hayward, Hobart, Williams and others committed the grossest perjury while on the witness stand in the Hale & Norcross case, and, in the event of the Chollar suit ending favorably to the plaintiff—there is every reason now to suppose that it will, it is quite likely that the facts will be brought under the notice of the Grand Jury with the view of having the Comstock "looters" criminally prosecuted.

The following is the weekly statement of the ore hoisted from Comstock mines and milled, with the car and battery assays, etc.:

Mine.	Tons hoisted.	Car s'mple assay.	Tons milled.	Average bat. assay.	Bullion product for week.	Bullion shipped.	Bullion retained.
		$		$	$	$	$
Con., Cal. & Va.	1,209	30.48	980	26.54	....	*67,774.54	....
Crown Point	.. .	.....	.....	.....	....	† 217 oz.	....
Hale & Norcross	‡472	20.03	429	14.66	....	§11,548.31	....
Ophir	36	21.92	.....	....	.. .	....	....
Overman	61	25.62	.....	221.0	....	7,306.90	....
Potosi	....	23.67	380	19.66	....	430½ oz.	....
Savage	621	24.42	525	20.95	7,695.50	....	..
Yellow Jacket	**...	....	.....	....	....	....	....

* In four shipments. Total amount to May account, $84,062.63.
† Product of ore reported last week.
‡ Cars.
§ Final shipment on May account.
** No report.

Consolidated California & Virginia Mining Company.—The expenses for the month of May have been paid, and the company has an overdraft of $2,600. In light of the fact that the stockholders have not received a dividend for some time, it would be interesting to know just exactly what it costs to produce the bullion now being yielded. The quarterly statements showing these particulars are no longer made public, the report being that Mr. Mackay gave an order to that effect when he was last here. The following is a statement of the bullion produced during the present year:

Month.	Tons Ore.	Bullion Product.			Average yield per ton.			Average value per bat'y s'ple
		Gold.	Silver.	Total.	Gold	S'lv'r	T't'l.	
Jan.	4,400	....	....	$87,260.01	10·62	9·20	19·82	29·03
Feb.	4,020	$37,693.88	$35,776.41	73,470.29	9·37	8·89	18·27	24·25
Mar.	4,277	47,271.83	28,294.79	75,566.62	11·95	6·61	17·66	21·52
Apr.	4,970	53,659.09	29,042.39	82,701.48	10·79	5·84	16·64	18·83
May	4,435	48,744.87	35,317.76	84,062.63	10·99	7·96	18·95	24·50
	22,102			$403,061.03				

Crown Point Mining Company.—The annual election was held this week, there being represented 95,917 shares, and the following officers and directors elected: C. L. McCoy, president; A. K. P. Harmon, vice-president; and J. P. Martin, W. E. Mills and J. H. Dobinson, directors. The election was in no way notable save for the fact that the combination of brokers, united for the purpose of reforming Comstock methods, contrived to seat one representative, Mr. Mills. He may make an ally in the cause of right for this mine. James Newlands was reelected secretary and S. L. Jones superintendent. The company has a credit of $22,258.58.

Lincoln County.

Pioche Consolidated Mining & Reduction Company.—This company has been prosecuting work for some months past on the Detroit claim in Bristol district, owned by Alex. I. Harrison and others, working the property for lead ore under contract of purchase. During the time the company has taken out and reduced several hundred tons of fairly good lead ore and Tuesday ult. consummated the purchase by paying $2,000 therefor, says the Pioche "Record."

Washoe County.

Reno Reduction Works.—Work at the reduction works has been suspended for a few weeks.

PENNSYLVANIA.

Coal.

The Albright Coal Company, representing the Pennsylvania Railroad Company, and which purchased the lands and rights of the Silverton Coal Company, near Llewellyn, in the western part of Schuylkill County, has placed a large force of men at work in opening up the old workings abandoned some time ago, with a view to making extensive developments.

Lytle Coal Company, Minersville.—This company, at whose colliery the drowning of ten men occurred on April 20 by the breaking through of an unknown body of water, has been successful in tapping the water from the old abandoned McDonald workings to the west of its operations. This body of water has been a menace to the company ever since it commenced work on its mine, and although small bodies of water have been tapped at different times, the main body was not reached until the 11th inst., when seven holes, from 20 to 30 ft. in depth, were being drilled. The water was struck at a distance of 140 ft. from the heading, where the Cockill water broke through at a pitch of 40°. The company, which now has the water under control, will be enabled to push its work forward more rapidly. Its breaker is in course of construction.

Pennsylvania Coal Company, Pittston.—This company mined more coal last month than ever before, excepting upon one occasion. The company mined 151,000 tons, or 30,000 tons more than last year's production for the same month.

Oil.

The Coroner's jury met at Oil City on the 13th inst. to inquire into the cause and location of the great fire. It was proved that the fire caught between Seneca Street bridge and the railroad bridge, from the ignition of gas rising from 17,000 bbls. of benzine flowing from the Keystone tank.

SOUTH DAKOTA.

Custer County.

The following record of tests of the cyanide process on South Dakota ores was published in the Custer "Chronicle" of June 11th:

Will you please print for the benefit and information of your many readers the following letter from our resident assayer, Mr. S. D. Porter. I wish to say by way of introduction that I have found Mr. Porter a careful and skillful assayer, and the experiments and tests described in his communication only go to confirm the many test returns received from abroad, whenever this our commonest class of ore has been subject to treatment by scientific men.

C. W. R.

"Custer City, S. D., June 7th, 1892.—I have made a very careful examination of a typical Custer County ore, and herewith give the results. The ore was selected by myself from the surface of three different ledges, and consists of a crystalline quartz with free gold, a little oxide of iron and a very small quantity of tellurides, with no pyrites. Careful assays of the mixed ore gives its value as $39.27 per ton. A free milling test produced at the rate of $10.25 per ton, or 26% of the assay value. A concentration test of 14.7 tons into 1 ton gives a concentrate worth $239.56 per ton, saving 41%, or at the rate of $16.30 per ton of ore. Another concentration test of 7.35 tons into 1 ton gave a concentrate worth $165.36 per ton, saving 57% or at the rate of $22.50 per ton of ore. A sample tested by the improved cyanide of potassium process yielded at the rate of $8.27 per ton or a saving of 21% of the assay value. A sample tested by chlorination without roasting yielded at the rate of $33.07 per ton, or 84% of assay value. The above concentration tests are not as good as I usually obtain, but this is surface ore, and the probabilities are that as depth is attained and ore becomes more pyritous much better results will be obtained. In regard to the cyanide process, I have never had a better result than 36% of the assay value on this class of ore. I have, however, had results as high as 92% of assay value on ore in this locality, somewhat different in character from the ore in question. There are some ores here that can be treated successfully by the cyanide process, but they are ores that will prospect little or none in the pan. I consider the proper process for treating the gold ores of this locality to be 'as follows': For high grade surface ore, free milling and chlorination. For low grade surface ore, free milling, concentration and chlorination. For the deeper pyritic ores concentration, roasting and chlorination.
Respectfully, S. D. PORTER."

Lawrence County.

Deadwood & Delaware Smelting Company.—It was expected that the D. & D. smelter would be blown in about the 15th inst., says the Black Hills "Daily Times," with increased facilities for handling ore, by reason of the new stack and other improvements which have been made since the shut-down. The trouble which has heretofore been experienced with Newcastle coke, which carried fully 25% ash, will be remedied, as the new contract with the coal company calls for coke that will not ash over 14%. The high percentage of ash was due undoubtedly to neglecting a previous washing of the coal, as coke containing much less has been produced from the same beds.

Hawkeye Mining Company.—Everything is now in readiness for the raising of the frame of the Hawkeye mill at Pluma. The grading has been finished and all the timbers have been prepared, so that when the work on the building begins it will be put together rapidly, says the Black Hills "Daily Times." It is expected that about Aug. 1st the mill will be in operation. Superintendent Hunter is at present in the East purchasing the necessary machinery and stock, shipments of which will be made in a short time.

Oro Fino Mining Company.—Superintendent Carpenter has received instructions from the directors to at once commence the work of sinking the shaft to a depth of 500 ft., says the Deadwood "Daily Pioneer." A boiler is now being removed from the dismantled Baby smelter to the mine, and as soon as set up and used in connection with the present boiler the capacity of the hoist will be increased sufficiently to allow sinking to the depth demanded. All work about the mine will be hurried. Stations will be made at every 100 ft. in the shaft, but no drifting will be done until the sinking to the required depth shall have been completed. If the body of ore increases in size and assays well a large concentrating plant will be built upon the property.

Potosi.—This is the name of a new mine owned and located by A. A. Jenkins and Wm. Hugginson, of Carbonate. They have struck 6 ft. of good silicious dry ore carrying $20 in gold and 3 ozs. in silver per ton. The formation is similar to Ruby Basin and Bald Mountain. They have now 45 tons of ore on the dump.

Seabury-Calkins Mining Company.—The management of this property has reason to feel greatly encouraged over the discoveries of the past week, says the Black Hills "Daily Times." The former management, in following a rich vein of soft clay-like material, which was quite rich, though the seam was narrow, had stoped out a chamber, probably 60 ft. deep, following what they supposed was a wall along the south. The new management determined to penetrate this deposit, and by a system of drifts discovered it to be a solid body of ore, the bounds of which have not been located.

Silver Queen Mining Company.—At this mine the development shaft which was sunk to ascertain the location of a vein, is now down 150 ft. The vein was encountered at a depth of 140 ft., uncovering some fine ore.

Pennington County.

Mineral Hill Gold Mining Company.—The directors of this company have entered into a contract with Ernest Fish and Nathan B. Wilcox for the erection of a stamp mill on the property, says the Custer "Weekly Chronicle." The mill is to be completed and ready for operation by the 1st of August, and will be located at the mouth of Henderson Gulch. It is the intention to put in facilities and power for operating 20 stamps, but at the present time only five will be placed in position. The mill has been ordered from the Gates Iron Works, of Chicago, while the engine and boiler will be shipped from Indianapolis.

Rapid City Chlorination & Smelting Company.—The plant is employing two shifts of about 30 men each and running continually. About 100 tons of ore will be treated daily, and it is understood that the company will soon double the capacity; all arrangements having been made for this in the construction of the buildings, says the Rapid City "Daily Republican." The ores worked are mined in Bald Mountain district near Deadwood, and are shipped here over the Elkhorn Railway for treatment.

Welcome Mining Company.—The machinery recently placed on the Welcome is in readiness for operations and the pump will be started to-morrow, says the Black Hills "Daily Times." It is estimated that about four days will be required to pump the water out of the workings, and by the latter part of this week they will be taking ore out. The chlorination works at Rapid are running on about 40 tons per day, and within ten days will be increased to about 75 tons a day. It is said ore can be taken out in six places, and there will be no trouble to take out 40 tons every shift. There is a very large amount of high grade ore in sight.

UTAH.

The Interior Department has requested Governor Thomas to name a mine inspector for the Territory.

Beaver County.

Horn Silver Mining Company Quarterly Report.—Following is the quarterly report for the three months ending March 31st, 1892, made by A. C. Washington, president: Jan. 1st, cash balance per last quarterly report, $275,304.28. Sales of ore: January, $22,848.85; February, $19,909.43; March, $54,568.38; royalty on cave ore, $1,510.42; total, $98,837.08. Interest account: United States Trust Company, $3,150; sundry amounts, $836.34; total, $3,986.34. Store at Frisco: Surplus funds, $1,507.54. Smelter at Francklyn: House rents, $122; grand total, $379,757.24. Disbursements.—Mining: Labor, supplies, timbering and dead work, $45,795.31. General expenses: Salaries and clerk hire, Frisco and Salt Lake City, $2,396.11. New York office: Salaries and clerk hire, $3,050; general and office expenses, $181.35; taxes, $116.44; printing and stationery, $107.10; rent, $100; total, $3,554.89. Dividends: Dividend No. 25, $50,000. Balance cash on hand: United States Trust Company, $210,000; First National Bank, $65,085.52; Deseret National Bank, $2,919.54; petty cash, $5.87; total, $278,010.93; grand total, $379,775.24.

Box Elder County.

Brigham City.—Two gas companies incorporated in this city have examined the gas fields in the vicinity. 12,000 acres, it is said, have been leased, and borings will be commenced at once for a 6-in. pipe. Corinne, Willard, and neighboring cities will be supplied.

Juab County.

Annie Consolidated Mining Company.—This is a new company formed to work five claims lying near

the Rio Grande loop, east of Eureka. The capital stock is placed at $500,000, divided into shares of a par value of $1 each. One hundred thousand shares are set aside as working capital. Eureka is designated as the principal office of the company. The officers are: John A. Hunt, president; W. M. Kessinger, vice-president; E. H. Rathbone, secretary; Geo. T. Bridges, treasurer and manager. These, with E. O. Lee, C. F. Rathbone and Wm. T. Bridges, constitute the board of directors. The shaft is down 60 ft. and they have a good showing in the bottom. It is said they already have ore assaying 40% lead and 20 oz. silver.

Last Chance.—A 20-H.P. hoist will soon be put up, says the Salt Lake "Herald." The owners intend to sink 300 to 400 ft. and then to cross-cut.

Summit County.

Anchor Mining Company.—Work in the Anchor shaft is progressing, though surface water is causing some trouble and pumps have to be used, says the Park City "Record." Four small but promising veins have recently been cut in the shaft, the ore from two of them averaging over 100 oz. They indicate the near proximity of a large body of ore. The concentrator is doing satisfactory work, and the entire property is in a promising condition.

Daly Mining Company.—The output of this mine for the five months of 1892 has been as follows:

Month.	Sulphides.	Bullion, ozs.	Ore. Val.
January	.....	.....	$38,687.48
February	.....	.....	27,230.33
March	.....	51,146	7,374.88
April	$67,588.47	47,689	20,507.13
May	.....	48,157	20,415.60
Totals	$67,588.47	146,992	$114,214.42

The Daly paid its regular dividend at the close of each month, 25 cts. per share, $37,500 monthly, or $187,500 for the five months. The May dividend was No. 63, and brought the total of Daly dividends paid up to $2,400,000.

Daly West Mining Company.—This mine has been forced to close down on account of surface water. Advantage is being taken of this condition of affairs to move the engine farther from the shaft, it now being too close. An addition is being built at the Marsac refinery; when completed it will be occupied as a drying room.

Lucky Bill.—Arrangements are being made at the Lucky Bill to again commence operations, says the Park City "Record." The property was looking well when it closed down and great confidence is expressed as to its future worth. The vein is strong and regular and contains good ore in bunches.

Ontario Silver Mining Company.—The product of this company for the past five months has been as follows:

	Bullion. ozs.	Ore. Value.
January	$60,885.55	$85,734.86
February	64,112.61	44,531.00
March	70,256.94	10,864.86
April	76,635.50	24,794.54
May	63,351.71	43,406.51
Totals	$335,242.31	$209,321.77

The usual dividend was paid at the close of each month, of 50 cts. per share, or $75,000 monthly, being $375,000 for 1892 thus far. The dividend paid May 31st was dividend No. 192, and it brought the total amount of dividends to date up to the huge amount of $12,800,000.

WASHINGTON.

Okanogan County.

On the Rainbow group 40 men are at work, and a great deal of development work is being done.

Everett Mining Company.—This company has purchased the Black Friars mine for $156,000. The shaft is down 190 ft.

Gold Finch.—It is reported by the Spokane "Review" that a pocket was struck in drifting on the 100-ft. level of this mine from which $10,000 was taken in three days.

Rainbow.—This mine, which was recently sold to Seattle parties for $105,000, has a force of 25 men at work building roads and putting up the necessary houses for the extensive development work soon to be commenced. The owners have sent east for a 10-ton stamp mill, and the machinery will be started as soon as it can be set up after arrival. Development work on the Rambler and Red Top is being pushed by Wilson and Forester, who located these claims early in the season, and who believe they have a very promising property. Cross-cuts along the surface of the ledge at different points show it to be fully 12 ft. wide and traceable for several hundred feet. The ore carries silver and assays in gold from $8 to $20 per ton.

Ruby City.—Two mills and concentrators have been built here by an English syndicate, and two miles of tunneling and shafting are opened and being actively worked.

Whitewater.—A Mr. Alexander, representing a foreign company, is negotiating for this property, says the Spokane "Review." The ledge on the Whitewater is a wide one, and averages about $24 per ton across the lead. The mill now on the property proved defective, but if the deal goes through a new 20-stamp mill will be erected on it at once.

FOREIGN MINING NEWS.

AUSTRALIA.

Considerable sensation has been made in Georgetown, North Queensland, by an extraordinary rich discovery of gold. A Mr. Johnson has deposited in the Queensland National Bank 1,250 oz. of gold which he took from 3 cwt. of ore in three days. The spot where this rich find was made is within the limit of the surveyed township of Percy. The Percy River, in the Etheridge gold-field, is situated about 75 miles almost due south of Georgetown. Very many good crushings have been obtained during the past six months. The reefs are generally small, and about 50 ft. is the depth of the lowest shaft. Hundreds of reefs are known in the locality.

BOHEMIA.

According to an Associated Press dispatch of June 13th, a miner named Havelka has confessed that he caused the fire in the silver mine at Birkenberg, near Pribram, which, according to an official statement, caused the deaths of 400 miners. His two brothers were among the dead. He says that he intended to keep his secret, but his resolution began to fail him after he saw the scores of dead bodies brought up from the pit. He ran away to the hill to escape the associations which constantly reminded him of the terrible slaughter. He got a place in a factory at Beraun eventually, but after remaining there two days was unable to keep his attention to work longer, and started out again on his wanderings. He could not sleep and he could not beg enough food to satisfy his hunger. He feared that he would go crazy if he did not relieve his mind. He therefore went to a priest in Milan two days ago and confessed what he had done. The priest told him he must return at once to Przibram, and tell his story. He is under arrest. The police think that Havelka is on the verge of insanity, if not already insane, and will have him examined by experts. The miner's story of the firing of the mine is incoherent. He at first said that during the change of shifts he poured petroleum on the wood work and subsequently set fire to it. He then was appalled by what he had done and tried to extinguish the fire, but it was too late, and so he ran for his life. Afterward Havelka corrected this version of the affair so as to give the idea that he accidentally dropped a match in a pile of refuse. His first story is believed to be the correct one. He has been unruly ever since he was engaged to work in the mine, three years ago. He had several fights with his superiors, and two weeks before the fire was threatened with discharge in case he did not reform. He formerly was a member of an anarchist society in Prague, and left the city because the police warned him that he was under surveillance and would be arrested unless he stopped his lurid speechmaking.

BRITISH COLUMBIA.

Kootenai.

The Spokane "Review" reports the arrival at Pilot Bay of three carloads of machinery for the smelter to be erected there by Dr. Hendry. This smelter is to treat ores from Kootenai and vicinity.

BRITISH GUIANA.

From the Demerara "Daily Chronicle" it appears that the chief objection to the new mining laws that went into effect on June 1st was not on account of the royalty imposed, but on the cutting down of the size of both placer and quartz vein claims. The law adopted in 1887, under which a large number of claims were located, allowed 500 acres as the size of a claim. The new law, secs. 16 and 17, provides that no mining claim shall be greater than 1,500 × 600 ft. Sections 192 and 193 make the provisions just given retroactive. It is this interference with claims already made that is exciting trouble.

MEXICO.

The President has decreed that according to the stamp law the products of metallurgical reduction works are subject to the payment of the ½% interior tax upon the total value of the precious metals which they contain in accordance with the respective assays. The franchises granted to certain companies exempt them from the above tax.

Durango.

Pittsburg & Mexican Tin Mining Company.—This company, whose mines are at Portillos, near Durango, have recently sent a carload of good tin to New York. This company is now working three mines. After a certain amount of concentration by means of washing, the ore is said to show 40% of tin. The smelting of the ore can be done in an ordinary smelter. The company intends working on a larger scale very shortly, and will ship the product to the United States.

Sonora.

(From our Special Correspondent.)

San Felix Mine.—A syndicate of Chicago capitalists have taken hold of the property, which is showing up well. The narrow gage railroad from the mine to Port Lobos, on the California Gulf, surveys for which have been concluded, will afford easy access to this and many other mining properties. The distance from the mines to Port Lobos is a trifle over 26 miles, and when completed a large mill will be erected at the seaport.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, June 17.

Heavy Chemicals.—Great dullness prevails in the market for heavy chemicals. For caustic soda and bleaching powder, the sales of which are now regulated by the agents, there has been the usual jobbing demand. Carbonated soda ash and alkali has been very quiet owing to the fact that the glassmakers season is now almost over; during July and August but little business in these chemicals need be expected. Sal soda, both foreign and domestic brands, has been quiet and featureless. Altogether trading in the heavy chemical market has been limited as to volume and humdrum in nature. Prices are as follows: Caustic soda, 70 per cent., 2·95@3·10c.; 74%, 2·97½@3·12½c.; 76%, 3·12½@3·25c.; 77%, 3·12½@3·25c. Carbonated soda ash, 48%, 1·55@1·60c.; 58%, 1·47½@1·52½c. Alkali, 48%, 1·55@1·60c.; 58%, 1·47½@1·52½c. Sal soda, English, 1·05@1·10c. Bleaching powder, 2·15@2·20c. on the spot, according to quantity.

Acids.—Business in this market continues good, and manufacturers, without any exception whatsoever, report that they have all the business they can attend to. Prices, however, continue comparatively low and unsatisfactory to manufacturers. The contract for supplying the United States Assay Office with sulphuric acid has been awarded to Messrs. Charles Cooper & Co., at a price reported to be 90c. per 150 lbs. The Assay Office, we understand, takes more than a million pounds of acid a year. Rumors of all sorts have always abounded in the acid market. Occasionally some bit of idle gossip is magnified into an item of news of the most startling nature. During the past week a report gained currency that another "acid combination" was to be started. It was asserted that, with this object in view, a meeting of several large producers of this city and Philadelphia had been held in the office of a well known manufacturer, whose office is in Cedar street. The names of the persons present were given, and according to a certain authority the preliminary steps had been taken to organize a "protective association."

Although the statement was absurd on its face we have thoroughly investigated the matter and we can state, without fear of contradiction, that no such meeting has been held. Every manufacturer in this city was interviewed by the ENGINEERING AND MINING JOURNAL, and every one of them, including him in whose office the meeting was reported to have been held, denies absolutely that such a meeting was held. It would be indeed strange if after the unsuccessful career of the Knickerbocker Chemical Company another "combination" would be attempted. We quote this week: Acid per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, $1.60@$2 according to quality; muriatic, 18°, $1; 20°, $1.12½@$1.25; 22°, $1.25; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 90c.@$1.10; mixed acids, according to mixture: oxalic, $7.25@$7.75. Blue vitriol is quoted all the way from $3.25@$3.50; alum, lump or ground, $1.55@$1.80. Glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—The market for brimstone is very dull and prices show a declining tendency. Quotations this week for goods on the spot are as follows: Best unmixed seconds, $24; best unmixed thirds, $23. To arrive, best unmixed seconds, $23.30; best unmixed thirds, $22.50.

Fertilizers.—The fertilizer market has been exceedingly dull during the past week. Sales are few and far between, and in no case do we hear of transactions of any magnitude. Prices show little change. When such has occurred it has generally been a decline. Our quotations this week are: Sulphate of ammonia, $2.80@$2.85 for bone goods and $2.87½@$2.90 for gas liquor. Dried blood, $1.80@$1.85 per unit for high grade and $1.70@$1.75 for low grade. Acidulated fish scrap, $11@$12, factory. Dried scrap, $21.50. Azotine, $1.80@$1.85. Tankage, $17.50@$21, according to grade. Bone meal, $22.50@$23.50.

Double Manure Salts.—Quotations are as follows for lots of from 10 to 50 tons ex-vessel New York; 48-53%, $1.13¼@$1.23¼; 90-95%, $2.13@$2.23¼.

Kainit.—There is no change to report in this article. During the past week arrivals at New York amounted to 600 tons and at Philadelphia 900 tons, all of which went into consumption. Prices remain: $8.75 for invoice weight and $9 for actual weight, New York and Philadelphia.

Muriate of Potash.—The market for muriate is very quiet. Sales during the week have amounted to 200 tons. Arrivals of 200 tons are reported. Syndicate prices are unchanged.

Nitrate of Soda.—The market, although quiet, is firmer than last week. Quotations show a slight advance. We quote: $1.67½@$1.70, both for spot and shipments.

Liverpool. June 8.

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

The principal feature of interest to report is that the colliers' strike in the Durham district has at last been settled through the kindly offices of the Bishop of Durham, who acted as mediator between masters and men, with the result that the former have agreed to take the men back on a 10% reduction instead of 13½%, as they were insisting upon 10 days ago. As regards the trade for heavy chemicals, there is no improvement to report, and business is disappointing all round. The policy of the Alkali Company has had the effect of stimulating foreign

competition, and a considerable amount of business in caustic soda, which has previously been done by English makers, has this year been taken away by foreign manufacturers.

Most of the Leblanc works are shut down this week for the usual Whitsuntide repairs.

Soda Ash.—Orders for Leblanc ash for prompt delivery are being refused, and as makers are behind on their contract deliveries, ash is likely to be scarce for the next three months. The nominal quotations for the commoner qualities for July delivery and on are as follows: Caustic ash 48%, £5 6s. 3d. per ton; 57-58%, £6 7s. 6d. per ton. Carb. ash 48%, £5 9s. 9d. per ton; 58%, £6 12s. 9d. per ton. Ammonia ash 58%, £6 7s. 6d. per ton. All net cash. The prime brands are held for a considerable premium over above figures. At the close to-day the Alkali Co. state they are fully sold in carbonate ash to end of this year.

Soda crystals in fair request and firm at £3 7s. 6d. @£3 10s. per ton less 5%.

Caustic soda is quite neglected, and stocks at works have accumulated. Spot quotations are as follows: 60%, £9 2s. 6d. per ton; 70%, £10 5s. per ton; 74%, £11 5s. per ton; 76%, £12 5s.@£12 10s. per ton. All net cash. For parcels under 10 tons 5s. per ton extra is charged. Shipment to America "barred" by the Alkali company.

Bleaching powder in moderate demand at £7 15s. @£8 per ton net cash for hardwood packages, for all quarters except United States and Canada.

Chlorate of potash scarce, but there are few orders, and 6¾d.@6¾d. per lb., less 5%, represent nearest values for June delivery, although Alkali Company quote 7d. For July—December we quote 6¼d.@6¾d., less 5%, but no business reported.

Bicarb. soda selling to a fair extent at £6 15s. per ton, less 2½% for one cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia.—Some makers are holding off in the hope of getting better prices, but in most cases holders are prepared to meet buyers, and values are nominally about £10 2s. 6d. per ton for good grey 24%, and £10 5s. per ton for good grey 25%, both in double bags, less 2½% f. o. b. Liverpool.

MINING STOCKS.

[For complete quotations of shares listed in New York Boston, San Francisco, Baltimore, Denver, Kansas City, Deadwood, Dak., Pittsburg, St. Louis, London and Paris, see pages 656 and 658.]

NEW YORK, Friday Evening, June 17, 1892.

After a spasmodic burst of semi-activity last week the mining stock market has resumed its pristine dullness. There is next to nothing going on now and as the San Francisco market continues weak and depressed we do not look for any immediate improvement in our own.

Perhaps nothing can show better the protracted inactivity in mining stocks here than the annual report of the Consolidated Stock and Petroleum Exchange. Mr. Samuel White, Jr., chairman of the Committee on Mining Securities, states in his report for the fiscal year ending May 31st, 1892, that the business of the committee has been the lightest in the history of the Exchange. Only 17 meetings were held.

The total transactions in mining stocks for 1891 to 1892 were as follows: May, 184,800; June, 200,940; July, 122,870; August, 113,880; September, 162,270; October, 163,630; November, 105,950; December, 95,390; January, 234,820; February, 174,320; March, 165,350; April, 109,910. Total, 1,834,130 shares. The number of shares sold for the corresponding period of 1890 to 1891 was 3,329,210. This shows a decline of nearly one-half in the number of shares sold.

For some years the sales of mining stocks at the Exchange have grown smaller and smaller. Notwithstanding this fact, Mr. White is inclined to be sanguine, as may be shown in the following paragraph of his report: "While transactions in shares have been light, interest in mining has not abated, as is witnessed in developments in several important mining locations. The experiment of the formation of mining exchanges in several cities of the West has not proven successful; their market is too narrow and daily demands are made on the East, especially New York, to find an outlet. Suggestions have come from some of the best producing properties to transfer the transactions from the several Exchanges West to our Exchange, and arrangements are underway at present which may result in making this Exchange the center for transactions in all such stocks."

We beg to differ with Mr. White's expressed views. There is not a mining Exchange to-day which is in first class condition as regards business in mining shares. Moreover, the only really important mining Exchanges, outside of New York, are in San Francisco, Denver, St. Louis and Boston, and it is altogether improbable that any of these would resign their business in favor of New York.

Of the Comstock we note sales of 250 shares of Consolidated California and Virginia; the price declined from $4.10 to $3.90; 100 shares of Gould & Curry at $1.15; 200 shares of Hale & Norcross at $1.50; 100 shares Sierra Nevada at 95c.; 200 shares Yellow Jacket at 95c.@$1.05; 100 shares of Barcelona at 19c.; 100 shares of Best & Belcher at $2.15; 5,500 shares of Comstock Tunnel at 12 to 13c.; 400 shares of Consolidated Imperial at 12c.; 100 shares of Mexican at $1.53. 200 shares of Potosi at 50@75c.; 100 shares of Union Consolidated at $1.10; 200 shares of Utah at 5c.

Of the Tuscaroras there were sales of 100 shares of Navajo at 13c., and 500 shares of North Belle Isle at 10@19c. Commonwealth has levied assessment No. 8 of 10c. per share, payable in New York at the office of Mr. E. R. Grant, 57 Broadway. The stock will become delinquent at San Francisco on July 21st, and will be offered for sale on August 18th.

There was a sale of 100 shares of Eureka Consolidated at $2.

Of the California stocks we note sales of 100 shares of Bodie Consolidated at 30c. Of Standard Consolidated 200 shares were sold at $1.60. The proceeds of this company for the month of May amounted to $20,000; the expenses for the same time were $14,900, leaving a profit of $5,100. Of Belmont 1,000 shares are reported to have been sold at 38@39c. Brunswick Consolidated was quiet, only 200 shares being sold; the price declined from 18 to 16c.

Of the Colorado stocks there were sales of 100 shares of Chrysolite at 18@25c.; 700 shares of Leadville Consolidated at 17@18c. Little Chief appeared in considerable demand, and 2,500 shares changed hands at 25@27c. Silver Chord was heavily dealt in, 4,150 shares being sold during the week at 35c.

Of the Black Hills stocks Caledonia shows a single transaction of 100 shares at 86c. Of Deadwood 200 shares were sold at $2.15. Homestake was in some demand, 350 shares being sold at $14. Of Sullivan Consolidated 900 shares changed hands at 69@75c.

Alice shows a sale of 100 shares at 75c.

Horn Silver was in good demand during the week. Sales amounted to 500 shares at $3.55@$3.60. The directors of this company will meet on the 21st inst. at the office of the company in this city for the purpose of declaring the quarterly dividend. The books will close on the 23d inst.

Phœnix of Arizona continues in good demand. It was one of the most active stocks during the week. Recorded transactions aggregate 5,000 shares at 57@61c.

Boston. June 16.

(From our Special Correspondent.)

This has been a dull week for copper stocks, and transactions have been limited throughout the list. The tendency of prices is downward, and there is nothing in the immediate outlook to indicate a change for the better. There is very little demand for investment, and the speculative element seems to be wanting. Boston and Montana, usually active, has been extremely dull; less than a thousand shares changing hands for the week, and to-day there was but a solitary sale of one share. There was a slight advance early in the week to 43¼, with later sales at 42¼ in small lots.

Butte & Boston participated in the dullness, but held the price of last week quite firmly, closing to-day at $12½.

There was a little better feeling on Osceola in consequence of the settlement of the strike at the mine and the resumption of production, which carried the price up from $31⅝ to $32¾, with reaction to 32.

Calumet & Hecla declined to 268, with recovery to $270. Tamarack held steady at $166 on light sales.

Tamarack, Jr., declined to $43½ with no activity in it.

Atlantic was a little better at 10½ to 10¾, but fell off to 10⅜ to-day for 100 shares.

Centennial sold at $10 and Kearsarge dropped from $13 to $11¾, recovering to $12¾ on sales to-day.

Franklin holds steady at $14⅜@$15, Wolverine declined $2, Allouez sold at $1@$1¼ for 50 shares, and Santa Fe at 12½@13c.

The silver stocks continue to be neglected and prices are generally lower. Crescent sold to-day at 8c., the lowest price for many years.

There was no improvement at the afternoon board, and the market closed dull and lower.

San Francisco. June 10.

(From our Special Correspondent.)

The stock market continues very heavy, and while only nominal interest is being taken by the street in the daily transactions, the prospect is not calculated to encourage the hope that things will soon change for the better. During the current week a considerable amount of activity has been displayed by Savage, and interest has centered in this stock to the exclusion of all others. As the annual election takes place next month, and there is said to be several Richmonds in the field seeking control, this in itself will account for the sudden rally in the price of the stock.

At present Flood is at the head of affairs and is supported by the combination of reform brokers, but it is fair to him to say that he repudiates being engaged in any underhand tactics to sustain him in his position. He professes continued friendship for A. Hayward et al., and is willing to hand over the control of the Savage mine if called upon in a legitimate way to do so. All very well, but Mr. Flood cannot be congratulated upon his friends—by whom a man is himself judged—and at the same time it is well to remember that Mr. Flood has been in the market this week as a heavy buyer of Savage stock.

At the north end of the Comstock prices have caused Consolidated California & Virginia to sell as low as $3.70; to-day it is ruling at $3.95. Mexican sold to-day for $1.45, Ophir for $2.40, and Sierra Nevada for $1.05.

Of the middle group of Comstocks Best & Belcher is quoted at $2.05; Gould & Curry, $1.10; Hale & Norcross, $1.40, and Potosi, 65 cents.

As nobody seems to really expect any improvement in the Gold Hill and South End mines, it is not to be wondered that the stocks are not in demand. Prices continue downward, with light sales. In the afternoon session Alpha sold for 25c.; Alta, 40c.; Belcher, 90c.: Bullion, 60c.; Challenge Consolidated, 30c.; Consolidated New York, 45c.; Crown Point, $1; Occidental, 45c. Seg Belcher, 30c., and Yellow Jacket for 90c.

Some scattering sales have been made of outside stocks, but the demand is in nowise brisk. Mono sold for 45c., North Commonwealth for 20c., Nevada Queen for 85c.—a sharp shrinkage during the week—and Del Monte for 10c.

SAN FRANCISCO, June 17.—(*By telegraph.*)—The opening quotations to-day are as follows: Best & Belcher, $1.90; Bodie, 20c.; Belle Isle, 5c.; Bulwer, 40c.; Challar, 30c.; Consolidated California & Virginia, $3.85; Eureka Consolidated, $2: Gould & Curry, 85c.; Hale & Norcross, $1.15; Mexican, $1.50; Mono, 35c.; North Belle Isle, 10c.; Navajo, 5c.; Ophir, $2.20; Savage, $1.55; Sierra Nevada, 85c.; Union Consolidated, 85c.; Yellow Jacket, 75c.

DIVIDENDS.

Colorado Central Consolidated Mining Company, dividend No. 33, of five cents per share, $13,750, payable July 11th, at the office of the Farmers' Loan and Trust Company. New York city transfer books close June 30th and reopen July 12th.

Homestake Mining Company, dividend No. 167, of ten cents per share of $12,500, payable June 25th, at the office of Messrs. Lounsbery & Co., Mills Building, No. 15 Broad street, New York. Transfer books close June 20th and reopen June 27th.

Napa Consolidated Quicksilver Mining Company, dividend No. 46, of ten cents per share, $10,000. Also an extra dividend of ten cents, $10,000, payable July 1st, at the office of the company, No. 86 State street, Boston, Mass. Transfer books close June 15th and reopen July 2d.

The Thomson-Houston Company has declared a semi annual dividend of 3½%, or 87½ cents per share, on the preferred stock, payable July 1st, to stockholders of record June 14th. The transfer books will be closed from June 15th to 20th, both days inclusive.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Amt. per share.
Belcher, Nev	44	May 17	June 21	July 12	.25
Bullion, Nev	38	May 24	June 28	July 19	.25
Challenge Consolidated, Nev	11	May 16	June 20	July 12	.25
Chollar, Nev	33	May 28	July 7	July 27	.50
Comm'nwealth, Nev	8	June 16	July 21	Aug. 18	.10
Cons. St. Gothard, Cal	5	June 9	July 14	Aug. 4	.05
Diana, Nev	8	May 3	June 10	June 30	.08
Golden Prize, Nev	5	Feb. 29	June 9	June 20	.25
Gould & Curry, Nev	69	June 7	July 12	Aug. 4	.25
Justice, Nev	50	May 2	June 6	June 27	.15
Mexican, Nev	45	May 16	June 21	July 12	.25
Norway, Utah	....	Dec. 24	Feb. 1	July 21	.02
Ophir, Nev	58	June 3	July 7	July 27	.50
Overman, Nev	64	May 19	June 22	July 11	.30
Sierra Nevada, Nev	102	June 10	July 13	Aug. 2	.25
Siskiyou Cons., Cal	4	May 14	June 17	July 8	.01½
Summit, Cal	12	May 20	June 27	July 19	.05
Utah Cons., Nev	15	June 7	July 11	July 29	.25
Yellow Jacket, Nev	51	May 9	June 14	July 18	.25

PIPE LINE CERTIFICATES.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 11	54⅝	54⅝	54⅝	54⅝	8,000
13	54¾	55⅛	54⅜	55⅛	12,000
14	55	55	54¾	55	16,000
15	....	....	....	....	.....
16	....	....	....	....	.....
17	54⅞	55¼	54⅞	55	6,000
Total sales in barrels					42,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 11	53¼	53¼	53¼	53¼	10,000
13	....	....	....	....	....
14	....	....	....	....	....
15	....	....	....	....	....
16	....	....	....	....	....
17	....	....	....	....	....
Total sales					10,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 17th.

Statement of shipments of anthracite coal (approximated), for week ending June 11th, 1892, compared with the corresponding period last year:

Regions.	June 11. 1892.	June 13. 1891.	Difference.
	Tons.	Tons.	Tons.
Wyoming Region	431,515	470,980	Dec. 39,465
Lehigh Region	116,828	135,230	Dec. 18,402
Schuylkill Region	230,891	256,823	Dec. 25,932
Total	782,234	863,033	Dec. 80,799
Total for year to date	16,891,809	15,824,144	Inc. 1,067,665

PRODUCTION OF BITUMINOUS COAL for week ending June 11th, and year from January 1st.

EASTERN AND NORTHERN SHIPMENTS.

	1892. Week.	1892. Year.	1891. Year.
Phila. & Erie R. R	1,628	39,246	49,185
Cumberland, Md	74,108	1,582,036	1,893,872
Barclay, Pa	4,127	91,349	80,587
Broad Top, Pa	11,695	262,806	233,135
Clearfield, Pa	78,189	1,716,305	1,888,042
Allegheny, Pa	25,746	539,588	612,029
Beach Creek, Pa	42,372	1,145,883	1,049,639
Pocahontas Flat Top	51,243	1,608,896	1,130,404
Kanawha, W. Va.	49,074	1,689,983	1,057,753
Total	338,182	7,445,792	7,994,646

WESTERN SHIPMENTS.

	1892. Week.	1892. Year.	1891. Year.
Pittsburg, Pa	24,954	585,323	479,095
Westmoreland, Pa	35,551	721,027	836,474
Monongahela, Pa	9,591	250,690	234,605
Total	70,098	1,557,040	1,550,174
Grand total	119,172	2,647,023	9,541,820

PRODUCTION OF COKE on line of Pennsylvania R. R. for the year ending June 11th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 99,229 tons; year. 2,502,023 tons; to corresponding date in 1891, 1,428,566 tons.

Anthracite.

The combine came into court at Trenton, N. J., on the 15th. The motion of the attorney-general, however, was met by a petition from the combine's lawyers to delay the case for a fortnight at least, and much longer if possible. The reason for the adjournment was that they had not had time to prepare their case. The Chancellor granted the application for adjournment, and decreed that the combine should prepare their case by the 1st of July, so that the State should be able to look over the line and points of the defense, and that the counsel should proceed with the arguments on July 7th.

This course of proceedings on behalf of the deal is a sign of either of two things. Firstly, it may be that the members are not agreed among themselves as to their future, or that they feel that the decision in the court will be adverse to them, and that they are therefore endeavoring to prolong the time during which they are allowed to extract money from the pockets of consumers. It is quite certain that they are ready enough with their case; they had consulted all the points of the law before they ever established the deal. In the meantime, the position of the Reading company is becoming more influential than ever. The advent of the hot weather has made the market still more lifeless and flat. No new business is being sought for, and dealers and consumers generally are too much inconvenienced by the heat to trouble themselves to find out a method of resisting the combine. The Anthracite Coal Sales Agents met yesterday at the Central Building, but no business of importance was transacted.

Another meeting will be held on the 29th June to arrange the prices and fix the output for July. We may expect a rise on July 1st on all sorts of anthracite.

There is a consideration which may be mentioned with regard to the wisdom of the policy of the deal. The producers are also the carriers; so if they raise the price and restrict the production, will not the decrease in the receipts from freigh charges, due to the restricted production, counterbalance to some extent the profit due to the higher price?

Pea coal is plentiful and its price is low. The contract for supplying the United States Mint at Philadelphia, with 5,000 tons for one year, has been given to Downing Brothers, who are on the Pennsylvania Railroad, and the price was $2.59 per ton delivered. The Philadelphia & Reading Coal and Iron Company bid $3.15 per ton delivered.

Bituminous.

The condition of the bituminous coal trade is dull, though for the period of the year it is decidedly healthy. There are indications that bituminous trade is at present growing more than anthracite, and we believe it is beginning to take the place of pea coal for manufacturing purposes. The Council at Philadelphia are taking the smoke nuisance in hand, and one of their number is proposing to revive an old law against the burning of soft coal within the city on the Pennsylvania Railroad engines.

NOTES OF THE WEEK.

The Pennsylvania Railroad Company, after extended negotiations, has obtained full control of the William Penn Coal Company colliery. This mine has an annual shipment of close on to half a million tons, employing fully 700 men and boys. This new move of the Pennsylvania Company will necessitate the opening of a new branch road from its terminal at Shenandoah, as shipments have been made heretofore via the Reading. The Philadelphia & Reading are preparing to develop some of the hitherto unworked seams in the Hecksherville Valley. In the Clearfield region a good deal of surveying is still going on. The Decatur track is to be opened up again and the work on the Drane Farm will be commenced shortly. It It is believed that the coal of the Houtzdale shaft and the Brisbin and Decatur slopes will be sent to market over the Beech Creek Railroad; this makes it probable that the line of railway surveyed last week from Osceola up and along the Moshannon Creek is intended for an extension of the Beech Creek Railroad from its present terminus at Philipsburg. The connection which is about to be built between the Beech Creek Railroad and the Buffalo, Rochester & Pittsburg Railroad will put on the Reading system a quantity and quality of bituminous coal and coke which will make that railroad company a strong factor in the bituminous trade. Heretofore the coal and coke from the Reynoldsville region has gone mainly to the Buffalo market, but when this new line is completed the output will be greatly increased, and this coal will be placed in the tide-water markets. Its chief shippers over the Reading system will be the Bell, Lewis & Yates Mining Company and the Bloomington Mining Company.

One of the largest coalbreakers to be built at Silver Creek will be 136 ft. in breadth. The Lehigh & Wilkes Barre Coal Company are going to build a new breaker to treat the coal from the extended workings at Green Mountain.

A good deal has been written about the proposal to transport coal in a powder form by means of hydraulic mains; but hitherto the proposal has been scouted as an utterly wild idea. However, it seems that it is seriously contemplated, for Mr. H. C. Frick has given the method a trial. He says he is not yet in a position to judge of the practicability of the method, but it is his opinion that it is practicable and that it will in time be used. He mentions two drawbacks, viz., the clogging of the pipes or the stoppage of the pumps, and the cost. As regards the latter he says it compares unfavorably with other methods of transport, but that there is no reason why this should not be remedied just as the transportion of oil through pipes was made a success after a period of failure. Although he holds such a favorable view of this scheme he does not intend to experiment on it again just at present.

Buffalo. June 16.

(From our Special Correspondent.)

There are no features of interest to report in relation to the anthracite coal trade; prices are without change but a feeling exists among the trade that higher quotations will rule next month. The movement by lake westward has increased in volume but freights are unchanged. For home consumption or rather domestic supplies of hard coal the orders are beginning to come in.

Bituminous coal quiet and steady, stocks ample. Coke quiet and unchanged.

The Lehigh Valley Railroad (Reading system) is nearly completed. The new passenger station here is well under way and will be ready in about three or four weeks hence. The Reading combination still gives food for thought.

The movement of coal by canal at this port for the second week in June were shipments of 1,422 net tons.

The shipments of coal from this port by lake from June 8th to 14th, both days inclusive, were 88,830 net tons, distributed about as follows: 50,200 to Chicago, 14,600 to Milwaukee, 9,450 to Duluth, 2,000 to Superior, 2,360 to Green Bay, 2,510 to Racine, 2,600 to Detroit, 600 to Toledo, 100 to Sheboygan, 200 to St. Ignace, 800 to Saginaw, 2,200 to Gladstone, 1,110 to Algonac and 100 to Alpena. The rates of freight were as follows: 60c. to Chicago and Green Bay, 50c. to Milwaukee and Algonac, 65c. to Racine, Manitowoc and Escanaba, 70c to Kenosha, 40c. to Port Huron and Saginaw, 25c. to Detroit and Toledo, 30c. to Duluth and Lake Superior and 65c. to Sheboygan, closing firm.

Chicago. June 16.

(From our Special Correspondent.)

There is a positive dearth of news in the coal trade just now. Companies' and individual mine owners' agents inform us that the present masterful inactivity is liable to continue until well into next month, and some believe that August will be reached before there will be any life to the trade. It is evident, if this reasoning is a correct one, and from the present attitude of dealers and the consuming public we are more than inclined to think it is, then we are to expect a quiescent period of at least sixty days, and maybe longer. This will crowd the selling and buying into about three months, more or less, which heretofore has been spread over a period of not less than five months, the major portion of the city domestic trade and that of large towns being accomplished during late June, July and August. This business, it must be remembered, is by far the most desirable and profitable as it is spot cash, than to have this crowded and filled on top of the other and later trade which comes in September and October, will inevitably cause a big gain and a rush rarely witnessed in this or any other market. Should prices continue to advance as intimated by the ENGINEERING AND MINING JOURNAL June 11, consumers may take to using soft coal or crushed coke.

Country dealers as well as city trade continue to hold off in hopes of obtaining cheaper coal later on. The former mentioned may be handicapped by the grain movement in July and August, and in all probability box cars about that time will be as scarce as they usually are at that period. Your correspondent had an interview with a large buyer and distributor about 70 miles south of here, who says he has thrown up his hands on anthracite, as he would be simply a collector for the combine. He would have to pay promptly for his coal and be liable for any bad debts and turn over the proceeds, and have his trouble and anxiety for pay.

His trade embraces some 50 small towns, and his custom was scattered among all the shippers. This is only one incident of the trade, and the question arises whether this class of trade will be as satisfactory to the company as in past years it has been to him and others similarly situated. Time alone can tell in regard to the matter. Vessel coal is coming forward very freely, and docks and yards are becoming well filled up, and only a small tonnage going out. Circular rates are held steady.

Bituminous coal is quiet, with a noticeable falling off during the week, but it is no worse than any other previous month of June, and is fully up to the volume expected at the commencement of the heated term. Many contracts are to be and have already been closed this month, but in other respects the market is very dull. surplus large and prices almost anything a consumer or dealer choses to offer. No improvement is expected until late next month.

Coke is in moderate demand. Very few foundries are working up to capacity and their requirements are light. Some of the coal trade are making inquiry as to crushed coke, as many consumers of hard coal will use it should the latter advance much higher.

Quotations are: $4.65 furnace; $5.05 foundry, crushed; $5.40 Connellsville; West Virginia, $3.90 furnace, $2.10 foundry; New River foundry, $4.90; Walston, $4.65 furnace, $5 foundry.

Circular prices are unchanged at the following rates: Lehigh lump, $6.35; large egg, $5.35; small egg, range and chestnut, $5.60. Retail prices per ton are: Large egg, $6.75; small egg, range and chestnut, $6.75.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are; Pittsburg, $3.15; Hocking Valley, $3; Youghiogheny, $3.25; Illinois block, $1.90@$2; Brazil block, $2.35.

Pittsburg. June 16.

(From our Special Correspondent.)

Coal.—Market dull, prices weak, not lower. Coal boating from this point is suspended on account of low water in the Ohio. The shipments since our last to Cincinnati, 839,000 bushels; to Louisville, 1,311,000 bushels; total, 2,150,000. All the Western and Southern markets are well stocked. Coal men are not anxious for water until fall, and a late fall rise would be more acceptable than an early one; in that event better prices may prevail. Rail shipments have been liberal. The New York & Cleveland Gas Coal Company have completed the purchase of 4,000 acres of coal land in Washington County. Negotiations have been pending for some time. The cost was in the neighborhood of $100,000. This company has several thousand acres of land in the Plum Creek section, and has never before reached across the Monongahela River. A part of this purchase will be developed at once.

Connellsville Coke Regions.—Trade continues in a very depressed condition, with a falling off in shipments to most points. Trade is not expected to show much improvement until there is a revival of the iron trade; all depends on a proper understanding being reached between the iron manufacturers and the Amalgamated Association. There is a report current in the oil regions that the railroads would in a few days reduce the rates of freight 10 cents per ton; this would assist matters materially. Condition of business in the oil region for the week: Ovens in blast, 11,080, with 6,103 idle. In the running order of the region, 30 plants, with 4,791 ovens, made 6 days; 28 plants, with 5,259 ovens, made 5 days; 9 plants, 423 ovens, made 4 days; 3 plants, 507 ovens, 3 days. Week's shipments: To Pittsburg, 1,700 cars; points west of Pittsburgh, 3,041 cars; points east of Pittsburgh, 1,334 cars; total, 6,075. Western shipments decreased 59 cars; eastern increased that amount; Pittsburgh decreased 200 cars, making the week's decrease 200 cars. Prices are nominal.

METAL MARKET.

NEW YORK, Friday Evening, June 17, 1892.

Prices of Silver Per Ounce Troy.

June.	Sterling Exch'ge.	London. Pence.	N. Y. Cents.	Value of £1. in $1.	June.	Sterling Exch'ge.	London. Pence.	N. Y. Cents.	Value of £1. in $1.
11	4.88	40¾	89	.688	15	4.88½	41	89⅝	.693
13	4.88	40¾	88⅛	.689	16	4.88½	41	89⅝	.693
14	4.88	40⅞	89⅜	.691	17	4.88½	40⅞	89⅜	.691

The Government has been a free buyer of silver this month and as it gets its full complement to-day, sellers must depend on the London market for the next two weeks for their customers. As the Indian Monsoon is about due, buying for the East is not likely to be carried on on a very liberal scale, consequently, unless some new features present themselves, the market for silver will probably be a halting one for the present.

The United States Assay Office at New York reports the total receipts of silver for the week to be 131,000 ounces.

Government Silver Purchases.

WASHINGTON, D.C. (*by Telegraph.*)—The Treasury Department purchased to-day 929,000 oz. of silver at prices ranging from .899 to .90 per fine ounce."

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Prices. H.	L.	Sales.
June 11	89¼	....	60,000
June 13	....	....	.....
June 14	....	....	.....
June 15	90¼	90	60,000
June 16	....	....	.....
June 17	90¼	....	5,000
Total sales			125,000

Gold and Silver Exports.

	For week ending June 11.	Since Jan. 1.	For week ending June 11.	From Jan. 1.
Gold	$1,658,983	$27,282,542	$11,495	$6,138,267
Silver	291,183	10,395,762	48,546	648,054
Totals	$1,950,176	$37,678,304	$60,041	$6,786,321

Domestic and Foreign Coin.

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

	Bid.	Asked.
Trade dollars	$ .70	$ .75
Mexican dollars	.69	.69¾
Peruvian soles and Chilian pesos	.65½	.67
English silver	4.83	.....
Five francs	.93	.95
Victoria sovereigns	4.89	4.92
Twenty francs	3.89	3.92
Twenty marks	4.74	4.76
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.79	4.83
Mexican doubloons	15.50	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Fine silver bars	.89¼	.90

Copper.—Since our last the mining companies have shown themselves more yielding in their views, and though some spot Lake copper was offered at 11·80c., it was not taken by any one, and the fact that there is some of the old French syndicate's copper now said to be for sale does not in the least contribute strength to the situation; in fact, quite the contrary. Casting copper, too, is somewhat easier at 11@11¼c., with stocks accumulating. Arizona pig copper, the only firm factor, there being but little of it available, we still have to quote at 10¼c.; but the price interfering, no business in it has been done.

In London the market for G. M. B.'s opened at £46 2s. 6d.@5s. for spot, and £46 10s.@£46 12s. 6d. for three months, and held steady all the week until the visible supplies were announced to have increased 1,700 tons for the first half of the month. This considerable increase could have but one effect, which is shown in the closing prices of £45 12s. 6d. for spot and £46 2s. 6d. for three months. For manufactured descriptions we quote: English tough, £47 10s.@£48; best selected, £50@£50 10s.; strong sheets, £55 10s.@£56; India sheets, £53 10s.@£54; yellow metal, 5¼d.

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

To Bordeaux—	Copper.	Lbs.	
S. S. Chateaux Lafite	80 casks	100,000	$10,500
To Liverpool—	Copper Matte.	Lbs.	
S. S. The Queen	3,030 bags	320,748	$16,000
" Arizona	2,285 "	240,341	12,000
" Servia	2,212 "	240,324	12,000
To Rotterdam—	Copper.	Lbs.	
S. S. Werkendam	404 pigs	143,950	$14,700

Tin continues on its upward course, gaining strength in its position, from day to day, and to-day's closing prices are 22.25 for spot, June and July, and 22.50 for delivery the balance of the year.

In London there has been a repetition of week before last, and from last week's closing figures of about £100 12s. 6d. for spot and 10s. less for futures, the market has advanced to £103 5s. and £102 10s. respectively, and when one considers that the shipments from the East to Great Britain and the United States aggregate a figure over 1,000 tons less than in '91, the consumption being fully as good as then, if not better, there seems to be no chance except for a further advance, as intimated by us last week.

Lead.—The pronounced decline of a week ago has made no further progress, unless for the sale of one or two lots to establish the quotation for bullion, as smelters have been holding out for 4¼@4·15c. Manufacturers still having sufficient to go on with, do not buy freely at the above figures, being rather inclined to think that the resumption of work in the Cœur d'Alene mines, with the consequent increased supplies of ore, means lower values, but this, we think, has already been discounted to the full extent. The position of the metal generally is not an unfavorable one, for stocks are certainly not excessive, and the supplies of raw materials though ample, are not tremendous.

London, however, shows a further decline of 5s., to-day's price for Spanish being £10 10s., and for English £10 12s. 6d.

Chicago Lead Market.—The Post-Boynton-Strong Company telegraph us as follows: "Market has been featureless during the past week, with values ranging around 4@4·05c., with no sales. Among refiners there is no desire to sell, all believing in higher prices later on. Spelter is firm at 4·65@4·70c."

St. Louis Lead Market.—The Messrs John Wahl Commission Company telegraph us as follows: "Lead, after selling early in the week as low as 3·90c., has recuperated to 3·95c., and we call this nominal value; at the close the demand appears to be light."

Spelter has been easing off a little here, in sympathy with the lower foreign quotations and the tenacious endeavors of American smelters to sell for future delivery. The premium ruling for spot has also gradually disappeared, and metal for this delivery can be bought at almost the same price as that for the last few months of the year. The price for spot, June and July we quote as 4·90 New York, and that for the later months as 4·80 to 4·85.

The London quotations are down about 10s. from £22 7s. 6d. to 10s., reported a week ago, to £22 for good ordinaries and £22 2s. 6d. for special brands. This decline may prove to be due to the fear that the price convention of the foreign producers, terminating the end of this month, may not be renewed. Anyhow, the immediate effect will be to make more difficult the exporting from here of spelter, and the consequent greater supplies in this country, indicate much lower prices ere long.

Antimony is about steady at 14¼ for Cookson's, 12¾ for L. X., and 11¼ for Hallett's.

Nickel.—There is a steady but desultory demand at 60c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 17.

Pig Iron.—We said last week that we expected that manufacturers would shortly have to consider the advisability of making a general revision of their prices on a lower scale. This probability is becoming still greater as time goes on and Eastern manufacturers are now seriously considering the question. Before accepting the inevitable, however, they are trying to find some method of staving off the reduction and during the last few days they have been discussing as to whether any good would come of a restriction in the manufacture. An action of this sort would bring no relief to local manufacturers, but would only strengthen the market here for Western and Southern pig irons. Then such a step should not be taken at present on account of the situation at Pittsburg. The impending strike at the rolling mills will probably bring business to the Eastern manufacturers and consequently there may be a slight increase in the demand for local pig iron. The general effect throughout the country, however, will be to lower the price of pig iron on account of the demand for Western pig iron being reduced, and therefore though the demand for local pig iron may be increased the price will not become any firmer. The *Iron Age's* figures for the production of pig throughout the State during May show that the weekly capacity of the furnaces on June 1st is less than on May 1st. The number of furnaces in blast on June 1st was 269, as against 268 on May 1st, but their weekly capacity on June 1st was only 175,174 gross tons of pig iron, as compared with 177,886 on May 1st. The cause of the decrease in cspacity is said to be the increased number of charcoal furnaces and the decreased number of large coke furnaces in operation.

Speigeleisen and Ferromanganese.—There is nothing new in the way of business in these lines. The consumers of spiegeleisen seem to have their wants satisfied at present, and no new business is expected. Inquiries are made for ferromanganese, but they don't lead to any business.

Merchant Iron and Steel.—The characteristics of this market do not alter, and it remains quiet and steady. There is no change in prices, which are as follows: Mushet's special, 48c.; English tool steel, 15c. net; American tool steel, 6¼c. to 7¼c.; special grades, 13c. to 18c.; crucible machinery steel, 4·75c.; crucible spring, 3·75c.; open hearth machinery, 2·25c.; open hearth spring, 2·50c; tire steel, 2·25c.; toe calks, 2·25c. to 2·50c.; first quality sheet, 10c.; second quality sheet, 8c.

Steel Rails.—The rail mills mostly continue short of orders though in one or two cases an increase on the amount of work on hand is reported. We have heard an indefinite report that the construction of a new railroad west of the Alleghanies postponed by the results of the Baring failure is to be commenced shortly and that 40,000 tons of rails will be required. We however have been unable to ascertain the truth of the report nor have we obtained any definite information as to the location of the road. A meeting of the steel rail manufacturers will be held on Wednesday next, but it is not probable that any business of importance will be transacted. Quotations remain at $30 at mill, and $30.75 at tide water.

Rail Fastenings.—As yet there is no change to report in this market. Things are generally dull and there is no signs of an increase in business. Prices are unchanged and nominally are as follows: fish and angle plates, 1·65@1·70c.; spikes, 1·95@2c.; bolts and square nuts, 2·70@2·80c.; hexagonal nuts, 2·80c.

Tubes and Pipes.—There is nothing new to report in this trade. Prices remain unchanged. The ruling discounts are as follows: Butt, black, 57½%; butt, galvanized, 47%; lap, black, 67%; lap, galvanized, 55%; boiler tubes from 3 in. to 6 in., 60%; above 6 in. and below 3 in., 55%. The latest report of the proposed International Copper Trust is that it is not likely to be consummated, and therefore the prospect of an increased business in steel and iron pipes does not yet become any rosier.

Structural Material.—The effect of the impending great strike at Pittsburg will be to bring some work to Eastern mills. It is generally considered that the strike will probably be one of the longest and severest of modern times, and its efforts in partially changing the location of the iron trade will no doubt be permanent. We hear already of consumers making arrangements to send their orders eastward. It may just happen, of course, that the workmen at Pittsburg may recognize the fact that the manufacturers' profits are much less than they were, and that their demand for a reduction of wages is right and just; but such an event is not probable. We hear that a new building is to be erected at the corner of Broadway and Rector streets in this city. It is to be of large dimensions, and its height will be over 200 ft. There will be consequently a good deal of structural material required. Prices may be taken as follows: Beams, 2·30@2·50c.; angles, 2@2·10c.; sheared plates, 1·90@2c.; tees, 2·40@2·60c.; channels, 2·40@2·50c. Universal plates, 2@2·10c.; bridge plates, 2@2·10c. on dock.

It is stated that the hot metal route between the Edgar Thomson Blast Furnaces, at Braddock, Pa., and the Homestead Steel Works, at Homestead, Pa., will be built some time during the present year. In case this method of conveying the hot metal is put into execution, it is the intention to run the molten iron direct from the blast furnaces at Braddock to the Homestead Steel Works, and also the Duquesne Steel Works. This will necessitate the erection of two bridges across the Monongahela River, one to the Homestead Steel Works and the other to the Duquesne. It will be remembered that some time ago a test was made of this method of conveying, by means of wagons, the hot metal direct to the above two plants, and it was pronounced a success in every way. While it has not definitely been decided upon as to whether this matter will be taken up this year, in all probability such will be the case.

Buffalo. June 15.

(Special report by Rogers, Brown & Co.)

The usual summer dullness seems to have seized foundries already. Melts are being cut down on all sides and buying is correspondingly reduced. The past week has been unusually quiet, with no prospect of immediate improvement.

Most buyers for malleable foundries have pretty well covered for their requirements, as the furnaces which are willing to sell at buyers' prices seem also to be willing to give practically unlimited options. The result has been that the stronger furnaces have practically withdrawn from the market.

We quote for cash f. o. b. cars at Buffalo. No. 1 X Foundry Strong Coke Iron Lake Superior ore, $15.75; No. 2X Foundry Strong Coke Iron Lake Superior ore, $14.75; Ohio Strong Softener No. 1, $15.75; Ohio Strong Softener No. 2, $14.75; Jackson County Silvery No. 1, $18.00; Jackson County Silvery No. 2, $17.00; Lake Superior Charcoal, $16.50; Tennessee Charcoal, $17.00; Southern Soft No. 1, $14.65; Alabama Car Wheel, $19; Hanging Rock Charcoal, $20.50.

Chicago. June 16.

(From our Special Correspondent.)

The statistical reports of stocks of pig iron for June 1 indicate a general reduction. While some districts have increased them.—mostly in Tennessee, Ohio and around Pittsburg—others have made large reductions, notably in Alabama, Georgia, the Mahoning Valley, Illinois, Missouri and Wisconsin. This, to say the least, is gratifying, and will in a measure still further strengthen the market in this district. It is not to be inferred that prices are, or will be any higher, but concessions which heretofore have been taken as a matter of course, or for granted are not longer obtainable, or so curtailed that there is little left but the bare price. For instance switching charges, which range from three to five dollars a car, have in many cases been conceded in whole or in part, but now these are more or less restricted, that is, only a proportion of it is allowed, though in most cases the consumer pays it all. The market for crude iron, though a little quieter than the preceding week, was enlivened by the placement of several round lots of local coke iron which had been pending for some time at existing quotations. Another feature was the sales of Ohio Softeners in lots of several hundred tons to the agricultural implement trade. The stand-off between large consumers and sellers of Lake Superior charcoal iron continues and the position of the latter strengthens each week. Material financial aid having been afforded the striking boiler-makers, the prospects for an early adjustment are more remote than ever. Some mill agents decline to quote on bars, either iron or soft steel, for shipment after July 1, on account of labor troubles which appear imminent cast of us. Some little falling off is noted in demand for steel rails and fastenings. In other branches there is little change worthy of special comment.

Pig Iron.—Though the demand in a general way was lighter last week, many of the inquiries now coming forward will, it is more than probable, lead to sales. The statistical position of pig iron in the Chicago district is certainly stronger and will of course be reflected on the market. From the northwest a fair demand is noted for southern soft and foundry coke iron, and some of the larger consumers are gently feeling the market with a view to the early placement of orders. This is unquestionably due to the hardening in prices and in many cases options, which had been given, have been withdrawn. Some further transactions which had been in abeyance were quietly closed during the week and were mostly confined to the implement trade. In some cases small lots of Lake charcoal iron were

coupled with these trades at $16.50@$17. Buyers of this class of iron can dicover no break in the ranks of makers, and $16.50 is steady for scattered deliveries. The market is in better shape as a whole than it has been for months.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $16.50@$17; Lake Superior coke, No. 1, $14.50@$15; No. 2, $14@$14.25; No. 3, $13.75@$14; Lake Superior Bessemer, $16.50; Lake Superior Scotch, $15.50@$16; American Scotch, $17@$17.50; Southern coke, foundry No. 1, $14.75; No. 2, $14.25; No. 3, $13.75; Southern coke, soft, No. 1, $13.75; No. 2, $13.25; Ohio silveries, No. 1, $17.50; No. 2, $17; Ohio strong softeners, No. 1, $17.50; No. 2, $16.50; Tennessee charcoal, No. 1, $17; No. 2, $16.50; Southern standard car wheel, $20@$21.

Steel Billets and Rods.—Demand is moderate, and $24.50 is held steadily for 4 × 4 billets, smaller sizes proportionately higher. Steel rods are unchanged at $34.50, and demand good.

Structural Iron and Steel.—Bridge material is more active, and several good contracts placed. Beams and steel Z columns are in excellent inquiry for alterations and extensions, but prices are no better. Regular quotations, car lots f. o. b. Chicago, are as follows: Angles, $1.80@$2; tees, $2.20@$2.30; universal plates, $1.95@$2; sheared plates, $1.95@$2; beams and channels, $2.05@$2.25.

Plates.—The almost utter stagnation of trade locally on account of strike has created a good demand from outside points, but prices suffer and the business is very generally distributed. Very large stocks are carried here. Steel sheets, 10 to 14, $2.30@$2.40; iron sheets, 10 to 14, $2.20@$2.30; tank iron or steel, $2.10@$2.15; shell iron or steel, $2.75@$3; firebox steel, $4.25@$5.50; flange steel, $2.75@$3.00; boiler rivets, $4.00@$4.15; boiler tubes, 2¾in. and smaller, 55%; 7 in. and upward, 65%.

Merchant Steel.—In addition to season's contracts there is quite a good demand for merchant steel for immediate shipment from the general trade. Several large contracts from manufacturing trade were closed during the past week, but competition is very keen. We quote: Tool steel, $6.50@$6.75 and upward; tire steel, $2.25@$2.30; toe calk, $2.40@$2.50; Bessemer machinery, $2.10@$2.20; Bessemer bars, $1.75@$1.80; open hearth machinery, $2.40@$2.60; open hearth carriage spring, $2.25@$2.30; crucible spring, $3.75@$4.

Galvanized Sheet Iron.—Demand is quieter and inquiry for stock has fallen off, but mill orders are not sought for on account of threatened trouble at mills. Discounts, however, are unchanged, at 70 and 10% on mill lots and 70% off on Juniata and 70 and 5% off on charcoal from warehouse. An extra 2% to 5% is given on large orders.

Black Sheet Iron.—Inquiry is now active, but agents of eastern mills decline acceptance of orders for late summer delivery, as tronble is imminent in Western Pennsylvania. Quotations are firm at 2·85@2·90c. basis of No. 27 Chicago, for delivery before July 1st. Steel sheets are 10c. higher. Dealers quote 3@3.10c. from stock.

Bar Iron.—Large mills are not urging sales for June delivery as most of them are well booked up, and prices are decidedly more uniform than they have been. There is only a fair demand from manufacturers and the general trade. Quotations are 1·58@1·63c. with half extras added, and 1·65c. for all muck bar, Chicago. Jobbing orders are quoted at 1·75@1·85c., rates according to quality.

Nails.—Wire nails are in better inquiry from mill at $1.65@$1.70 base, f. o. b. Chicago, but actual sales at the advance are very light and those mainly from the Northwest. Jobbers quote $1.65 in small quantities. Steel cuts are in moderate demand at $1.65 in mill lots. Jobbing price is $1.65 from stock.

Steel Rails.—While there is still some falling off in demand for standard heavy sections, the steel mills here say that the outlook is very encouraging for further business for late summer or early fall delivery, this opinion being based on inquiries now coming forward. Quotations are steady at $31@$32.50 as to quantity, etc. Fastenings, etc., are quiet at $1.70 for iron or steel splice bars; spikes, $2.05@$2.15 per 100 lbs.; track bolts, hexagonal nuts, $2.65; square, $2.55.

Scrap.—Many railroads are withholding from the market on acconnt of the low prices now prevalent. Dealers don't look for improvement until after the heated term. Prices are entirely nominal. No. 1 railroad, $16; No. 1 forge, $15; No. 1 mill, $10.50 fish plates, $18; axles, $21; horseshoes, $16.50; pipes and flues, $7; cast borings, $6.50; wrought turnings, $9; axle turnings, $10.50; machinery castings, $10; stove plates, $8.50; mixed steel, $10.50; coil steel, $14; leaf steel, $15; tires, $15.

Old Material.—A sale of 500 tons iron rails is reported at $18.25, Chicago. Old car wheels are unchanged at $15@$15.25. Steel rails are without movement at $12 for mixed and $13.50 for selected lengths.

Louisville. June 11.

(Special Report by Hall Brothers & Co.)

The past week's canass of the iron market reveals nothing especially new; the same general order of things prevails; lethargy is the main feature, and while there are always variations in prices there is more of a disposition not to shade the lowest prices that have been ruling. Inquiries and sales have been lighter during the past week, but generally the trades have been made for early deliveries. There is nothing to indicate any early change from the present state of affairs.

Hot Blast Foundry Irons.—Southern coke No. 1, $14@$14.25; Southern coke No. 2, $13@$13.25; Southern coke No. 3, $12.75@$13; Southern charcoal No. 1, $16@$17; Southern charcoal No. 2, $15.50@$16; Missouri charcoal No. 1, $17@$17.50; Missouri charcoal No. 2, $16.50@$17.

Forge Irons.—Neutral coke, $12.50@$12.75; cold short, $12.25@$12.50; mottled, $11.50@$12.

Car Wheel and Malleable Irons.—Southern (standard brands), $20@$21; Southern (other brands), $18.50@$19.50; Lake Superior, $19.50@$20.50.

Philadelphia. June 16.

(From our Special Correspondent.)

Pig Iron.—The gravity of the situation in Western Pennsylvania is now thoroughly recognized, and there is a feverish feeling manifested to-day in this market which is likely to produce some sudden results. Up to this hour no transactions have occurred that could be traced to the possibility of a general strike in the West. A steady demand for all kinds of material exists. Of course the question of most interest is as to forge iron. Quotations range from $13.50 to $14. There is a good deal of stir in the offices, and a day or two may develop some important business. No. 1 Foundry is quoted at about $16; No. 2 at about $15, with variations for size of order. Bessemer pig is worth about $16.

Foreign Material.—Small lots of ferromanganese are passing at $60 for 80%.

Steel Billets.—Increased inquiry and a good many new offers have been made for steel billets at about $24.75, which seems to be the outside figure that buyers will pay. Indications point to a gradual increase in demand, and one or two parties speak very confidently of heavy transactions before the end of this month.

Muck Bars.—A few small lots have changed hands, and there are offers for large lots, which may possibly go through on account of the possibility of a strike.

Merchant Iron.—There is a great deal of strike talk now among merchant iron men, and until the outcome is known there will be a feverished unsettled feeling. The stocks on hand are confessedly light. Certain offers that were made last week by manufacturers have been withdrawn. Most of the Eastern mills, it is said, will continue at work in case there is a stoppage in the West.

Nails.—There is quite a demand for nails from stores, but factories are not doing much.

Wrought-Iron Pipe.—Very little new business has been reported in pipes, but tubes are selling quite freely at discounts ranging from 55 to 65%.

Merchant Steel.—An improved activity in merchant steel is reported to-day on all sides. It grows out of the fact that a few large consumers have made contracts for the fall.

Sheet Iron.—As heretofore reported, the chief demand just now is for galvanized on which discounts range from 70 to 75%. It looks as though there would be a great many large orders placed before the end of this month, the effect of which will be to harden prices in retail lots.

Plate and Tank Iron.—The plate iron makers report very little improvement. Some business was booked this week at prices which makers decline to give. It appears as though competition had reached a very aggravating point, and yet, favorable as are the market conditions, large users of plate and tank are quietly letting these opportunities slip. Steel tank, 1·75; shell, 2·10; flange, 2·30; firebox, 2·60@3·75, according to specifications.

Structural Material.—The past week has developed quite a good demand from small buyers, and to-day the talk is that there will be quite a run of orders from this to the end of the month. All of the mills are quite busy, but of course their managers are anxious to secure large orders now for the summer and fall.

Steel Rails.—A very discouraging report must be made regarding steel rails. It is impossible to bring business, makers say, and the inquiries which have been hanging on the market for a month or six weeks past are still there. We are promised some news after the meeting of next week. Quotations $30.

Old Rails.—The lowest quotations given for iron rails is $19 delivered, but some brokers are asking $20@$20.50 for deliveries next month. Steel rails can be had at $16.50.

Scrap.—This weeks quotations for No. 1 railroad scrap are $18 delivered at convenient points. Car wheels $15. Best machinery scrap $14.

Pittsburg. June 16.

(From our Special Correspondent.)

Iron and Steel.—The most important question now before the iron men and the Amalgamated Iron Works is, "Will there be a strike, or will the matter be arranged satisfactorily?" The question is one of great importance. Of course there is a wide difference of opinion. There are thousands and tens of thousands of workmen on the one side—on the side of the manufacturers with millions of capital invested. As a matter of fact, the workmen don't desire a strike that may cause idleness for an indefinite period and will probably be disposed to make such terms as will meet the views of the other side. On the other hand, from all we could learn, the manufacturers have no desire to close down their works, provided they can see their way clear to run them at a small profit. All persons who know anything about iron mills are aware that closing down is an expensive business. If closed the mills will undoubtedly remain idle until the owners see a prospect of making something. What does this mean? The workmen's scale was presented to the manufacturers June 15th, fully two weeks in advance of any previous year. The old scale don't expire until July 1st. Of course it is all guess work as to how matters will be arranged. Certain manufacturers, who held the opinion that a strike would likely take place, have made arrangements to run their works as non-union, contending that it would be impossible to pay last year's scale, as the present prices of iron and steel are the lowest ever known.

When last year's sale was signed steel billets sold at $25; to-day $22.60 is a fair price. Bessemer, $15.75; to-day, $14@$14.25. Grey forge, $13.25; to-day, $12.65@$12.75, and other descriptions in about the same proportion. The iron scale holds good for one year. The workmen know what the terms are; iron advancing or declining produces no change for them. On the other hand, makers have to take the chances of the market; should prices advance they secure the benefit. Should prices decline the losses belong to them. The Mahoning and Shenango Valley iron men have organized. They say "there must be a decrease in wages or a shut down."

A leading manufacturer said: "The amalgamated association has not yet presented a scale, although the manufacturers and representatives of the association had a conference. There will have to be a substantial reduction in all departments of the mills or the manufacturers will be compelled to shut down. In order to run their mills at a profit a reduction of 40% on finishers and 20% on pudlers will have to be made. The iron market is largely overstocked. The valley manufacturers are losing money by keeping their men at work. About one-third of the ore used in the valley is from Alabama."

The volume of business shows up fairly well. Steel billets are in steady demand; holders for prompt delivery firmer; those who expect a shut down are making arrangements to that end. The sales of Bessemer have been liberal, many extending to the end of the year. Standard grey forge maintains previous prices; outside lots sold at various prices; where consumers insist upon a special brand, prices are more satisfactory, but even with all the advantages of efficient and economical plants there are many furnaces that find it difficult to make iron for the prices now ruling. One of our large firms purchased 50,000 tons Bessemer pig for this year's delivery, payable in Bessemer ore and coke. Values in both instances will be governed by prices ruling at the time of deliveries. This is the largest sale of Bessemer ever reported. Estimating Bessemer at $14.25 the value of the deal reaches $712,500.

Standard Bessemer Ore.

6,500 Tons Bessemer Ore, June shipment, f. o. b. Cleveland ..... $400 cash.

Coke Smelted Lake and Native Ores.

6,000 Tons Bessemer, at Valley Furnace, July, August, September ..... $13.75 cash.
4,000 Tons Bessemer, at Valley Furnace ..... 14.00 cash.
4,000 Tons Bessemer ..... 14.25 cash.
1,200 Tons Bessemer ..... 14.00 cash.
1,000 Tons Bessemer, June, August ..... 14.15 cash.
1,000 Tons Bessemer, June, August ..... 14.15 cash.
1,000 Tons Bessemer, July ..... 14.25 cash.
1,000 Tons Grey Forge, spot ..... 12.75 cash.
1,000 Tons Grey Forge ..... 12.75 cash.
600 Tons Grey Forge, July ..... 12.75 cash.
500 Tons Grey Forge ..... 12.85 cash.
500 Tons Bessemer ..... 14.25 cash.
250 Tons Grey Forge ..... 12.90 cash.
175 Tons No. 2 Foundry ..... 14.00 cash.
100 Tons No. 1 Foundry ..... 15.00 cash.
75 Tons Silvery ..... 16.75 cash.

Charcoal.

600 Tons Cold Blast ..... 26.00 cash.
100 Tons No. 2 Foundry ..... 19.50 cash.
50 Tons Cold Blast ..... 26.75 cash.
50 Tons No. 1 Foundry ..... 21.00 cash.

Steel Slabs and Billets.

1,500 Tons Steel Billets, June ..... 22.80 cash.
1,500 Tons Steel Billets, at maker's mill ..... 22.45 cash.
1,000 Tons Steel Billets, " " ..... 22.90 cash.
1,000 Tons Steel Billets, " " ..... 22.60 cash.
1,000 Tons Steel Billets, delivered ..... 23.25 cash.
500 Tons Steel Billets, delivered ..... 22.20 cash.
500 Tons Steel Billets, June ..... 23.00 cash.

Muck Bar.

500 Tons Neutral ..... 25.00 cash.
500 Tons Neutral, June, July ..... 24.75 cash.
400 Tons Neutral ..... 24.70 cash.
300 Tons Neutral, June ..... 24.80 cash.

Iron, Skelp.

750 Tons Sheared Iron ..... 1.82½ 4m.
500 Tons Narrow Grooved ..... 1.57½ 4m.
500 Tons Wide Grooved ..... 1.60 4m.

Steel, Skelp.

1,000 Tons Wide Grooved ..... 1.45 4m.

Spelter.

300 Tons Spelter ..... 4.75 cash.
150 Tons Spelter ..... 4.80 cash.
50 Tons Spelter ..... 4.72½ cash.
50 Tons Spelter ..... 4.80 cash.

Ferro-Manganese.

100 Tons 80%, seaboard ..... 59.25 cash.
100 Tons 80%, domestic ..... 61.25 cash.

Steel Wire Rods.

600 Tons American Fives at Mill Prompt ..... 32.00 cash.

Old Iron and Steel Rails.

1,000 Tons Old Iron Rails ..... 20.00 cash.
100 Tons Old Steel Rails, Mixed ..... 15.50 cash.
100 Tons Old Steel Rails, Mixed ..... 15.25 cash.

Scrap Material.

500 Tons No. 1 R. R. W. Scrap, net ..... 14.75 cash.
300 Tons No. 1 R. R. W. Scrap, net ..... 15.00 cash.
200 Tons No. 1 R. R. W. Scrap, net ..... 14.90 cash.
50 Tons Iron Axles, net ..... 23.00 cash.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 11.		June 13.		June 14.		June 15.		June 16.		June 17.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams											.75		100
Alice, Mont													
Amador													
Atlantic, Mich													
Belcher, Nev													
Belle Isle, Nev													
Bodie Cons., Cal			.30										100
Bos. & Mont., Mont													
Breece, Colo													
Bulwer, Cal													
Caledonia, S. Dak											.86		100
Catalpa													
Chrysolite, Colo			.25		.18								100
Colorado Central, Colo													
Commonwealth, Nev													
Comstock T. bonds, Nev.					.17		.17		.17				2,000
" scrip., Nev													
Cons. Cal. & Va., Nev	4.05		4.10		4 10						3 90		450
Crown Point, Nev													
Daly													
Deadwood, Dak			2.15										200
Eureka, Cons					2.00								100
Father de Smet													
Freeland, Colo													
Gould & Curry, Nev					1.15								100
Grand Prize													
Hale & Norcross, Nev	1 50		1 50										200
Homestake, Dak					14 00								350
Horn-Silver, Utah			3.60		3.60		3 55						500
Independence, Nev													
Iron Hill													
Iron Silver													
Leadville Cons., Colo					.18		.17		.17				700
Little Chief, Colo	.27		.26		.25						.26		2,500
Martin White													
Mouiton													
Mt. Diablo, Nev													
Navajo, Nev									.13				100
N. Belle Isle, Nev									.10		.19		500
Ontario, Utah													
Ophir, Nev													
Overman													
Plymouth, Cal													
Quicksilver, Pref., Cal													
" Com., Cal													
Quincy, Mich													
Robinson Cons., Colo													
Savage, Nev													
Sierra Nevada, Nev											.95		100
Silver Cord, Colo									.35		.35		4,100
Silver King, Ariz													
Small Hopes													
Standard					1.60								200
Ward Con													
Yellow Jacket, Nev	1.05				.95								200

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 11.		June 13.		June 14.		June 15.		June 16.		June 17.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha													
Alta													
American Flag, Colo													
Andes, Cal													
Astoria, Cal													
Augusta, Ga													
" bonds													
Barcelona, Nev	.19												100
Belmont, Cal	.39	.38	.38		.38						.38		1,000
Best & Belcher, Nev			2.15										100
Bonanza King, Cal													
Brunswick, Cal			.18						.16				200
Bullion, Nev													
Butte & Bost., Mont													
Castle Creek, Idaho													
Chollar													
Comstock T., Nev			.12		.12				.13		.12		5,500
Con. Imperial, Nev					.12								400
Con. Pacific, Cal													
Crescent, Colo													
Del Monte, Nev													
El Cristo, Rep. of Col													
Emmett													
Exchequer, Nev													
Hollywood, Cal													
Julia													
Justice													
King. & Pembroke													
Lacrosse, Colo													
Lee Basin, Colo													
Mexican, Nev									1 55				100
Middle Bar, Cal													
Monitor, Colo													
Mutual S.& M.Co., Wash													
Nevada Queen, Nev													
N. Standard, Cal													
N. Commonwealth, Nev													
Occidental, Nev													
Oriental & Miller													
Phœnix Lead, Colo													
Phœnix of Ariz	.61	.58	.58				.56		.57				5,000
Potosi, Colo						.75			.50				200
Rappahannock, Va													
S. Sebastian, S. Sal													
Santa Fe, N. M													
Scorpion, Nev													
Seg. Belcher, Nev													
Shoshone, Idaho													
Silver Queen													
Sullivan Con., Dak	.70	.69			.73				.75				900
Sutro Tunnel, Nev													
Syndicate													
Tornado Con., Nev													
Union Cons., Nev	1.10												100
Utah, Nev											.05		200

*Ex-dividend. †Dealt at in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 12,700. Non-dividend shares sold. 13,800. Total shares sold 26,500.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	June 10.		June 11.		June 13.		June 14.		June 15.		June 16.		SALES.
Atlantic, Mich	10.75	10.25			10.50	10.25					10.38		450
Bodie, Cal													
Bonanza Development													
Bost. & Mont., Mont	43.25	43.00	43.25	42.75	43.00	42.75	42.38		43.00	42.25	42.25		655
Breece, Colo													
Calumet & Hecla, Mich			270		268		268		270	268			92
Catalpa, Colo													
Central, Mich													
Coeur d'Alene, Id													
Con. Cal. & Va., Nev													
Dunkin, Colo													
Eureka, Nev													
Franklin, Mich			15.00		15.00		15.25				15.00	14.75	243
Honorine, Utah													
Horn Silver, Utah													
Kearsarge, Mich									13.00		12 75	11.75	660
Lake Superior, Iron													
Little Pittsburg, Colo													
Minnesota Iron													
Napa, Cal													
Ontario, Utah													
Osceola, Mich			32.00		32.75	32.00	32.75	32.50	32.75	32.50	32.50	32.00	751
Quincy, Mich													
Ridge, Mich													
Sierra Nevada, Nev													
Silver King, Ariz													
Stormont, Utah													
Tamarack, Mich	166		166						166		166		35
Tecumseh, Mich													

NAME OF COMPANY.	June 10.		June 11.		June 13.		June 14.		June 15.		June 16.		SALES.
Allouez, Mich					1.00				1.00				300
Arnold, Mich													
Aztec, Mich													
Brunswick, Cal													
Butte & Boston, Mont	12.63										12.63	12 50	250
Centennial, Mich	10.00				10.00						10.00		164
Colchis													
Copper Falls, Mich													
Crescent, Colo											.08		400
Dana, Mich													
Don Enrique, N. M													
Geyser													
Hanover, Mich													
Humboldt, Mich													
Hungarian, Mich													
Huron, Mich													
Mesnard, Mich													
National, Mich													
Native, Mich													
Oriental & M., Nev													
Phœnix, Ariz													
Pontiac, Mich													
Rappahannock, Va													
Santa Fe, N. Mex	.13				.13				.13				8,700
Shoshone, Idaho													
South Side, Mich													
Star, Mich													
Washington, Mich													
Wolverine									1.15				50

Dividend shares sold, 2,886. Non-dividend shares sold, 9,864. Total shares sold, 12,750.

COAL STOCKS.

NAME OF COMPANY.	June 11.		June 13.		June 14.		June 15.		June 16.		June 17.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Cambria Iron							76½						20
Cameron Coal & I. Co													
Ches. & O. R. R													
Chic. & Ind. Coal R. R													
Do. pref													
Col. C. & I	34	33½	34¼	33⅞	34	33⅞	35	34	34½	34¼			1,918
Col. C. & Hocking C. I													
Consolidation Coal													
Del. & H. C	138		139¼	139	139½	139	139	138¾	137⅝	136⅝	136¾	136	2,700
D., L. & W. R. R	157½	156¼	157¾	156⅜	158¼	155¼	158	157	157⅝	156⅜	156¾		22,755
Hocking Valley	37	36½	37	36¾	37½	36⅝	37⅛	36⅞	37⅜	36⅝	37¾	37⅛	7,195
do. pref			77		77		77				76¾		434
Hunt & Broad Top							86						20
Do. pref	54⅞	54¾					54⅞		54⅞				160
Illinois C. & Coke Co													
Lehigh C. & N	53¾	53⅝	53¾		54	53⅝	54	53⅞					952
Lehigh Valley R. R	61⅜	61¼	61¼	61	61¼	61¼	61⅛	60⅝	60⅝	60¾			4,752
Lehigh & Wilk. Coal													
Mahoning Coal													
Do. pref													
Maryland Coal													
Morris & Essex							145¼		146	145½			55
New Central Coal													
N. J. C. R. R	138½	137¼	139	138¼	139¾	139	139⅝	138¼	138¾	138			4,100
N. Y. & S. Coal													
N. Y., Susq. & West	15¼	14⅝			14⅝				14⅞	14⅛	14⅜		4,215
Do. pref	66½	66			65¾	65¼			65	64½			820
N. Y. & Perry C. & I													
Norfolk & West. R. R			11										150
Do. pref			45¼										100
Penn. Coal													
Penn. R. R	55⅛	55	55⅝	55¼	55⅝	55¼	55⅝	55⅝	55¾				3,722
Ph. & R. R. R	59⅞	59⅝	60⅛	59⅝	61¼	60	61¼	59⅞	60⅛	59⅝	60	59⅝	212,307
Sunday Creek Coal													
Do. Pref													
Tennessee C. & I. Co	36¾	36	36¼	34½	35¾	35	37	36⅛			36⅛	36	9,200
Do. pref													
Westmoreland Coal													

†Ex dividend. Total shares so 575.

San Francisco Mining Stock Quotations.

NAMES OF STOCKS.	CLOSING QUOTATIONS. June 10.	June 11.	June 13.	June 14.	June 15.	June 16.
Alpha	.40	.35		.35	.30	.30
Alta						
Belcher				.10		
Belle Isle		.15		.15		
Best & Belcher	2.00	2.10		1.90	1.85	1.90
Bodie	.25	.25		.25	.15	.15
Bulwer	.40	.45		.45	.40	.40
Challar	.45	.40		.40	.40	.35
Commonwealth						
Cons. Cal. & Va	3.95	4.05		3 70	3.60	3.80
Cons. Pacific						
Crown Point	.95	1.05		.75	.70	.75
Del Monte, Nev						
Eureka Consolidated	2.00	2.00		2.00	2.00	2.00
Gould & Curry	1.05	1.05		.95	.90	.85
Hale & Norcross	1.40	1.45		1.25	1.25	1.10
M. White						
Mexican	1.45	1.50		1.30	1.25	1.55
Mono	.40	.40		.40	.40	.30
Mt. Diablo				1.15	1.15	1.15
Navajo	.05	.10		.05	.05	.05
Nev. Queen	.75	.80		.40	.50	.45
N. Belle Isle	.15	.15				
N. Commonwealth						
Ophir	2.40	2.50		2.25	2.10	2.15
Potosi	.60	.60		.55	.50	.40
Savage	2.00	2.15		1.95	1.85	1.75
Sierra Nevada	1.05	1.10		.95	.80	.85
Union Cons	1.05	1.10		.95	.90	.90
Utah	.15	.15		.10	.10	.10
Yellow Jacket	.95	.95		.75	.70	.75

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and amount of last			Dividends. Total paid.	Date & amount of last.		
1	Adams, s. l. c.	Colo.	$1,500,000	150,000	$10	*				$637,500	Jan.	1892	.05
2	Alice, s.	Mont.	10,000,000	400,000	25	*				975,000	Nov.	1891	.06¼
3	Alma & Nel Wood., g	Idaho	300,000	30,000	10	*				60,000	Jan.	1889	.50
4	Amador, g.	Cal.	1,250,000	250,000	5	*				31,250	Aug.	1890	.12½
5	American Belle, s.g.c	Colo.	2,000,000	400,000	5	*				50,000	April	1891	.12½
6	Americ'n & Nettie, g.s	Colo.		300,000						175,000	Mar.	1892	.05
7	Amy & Silversmith, s.	Mont.		341,419						247,530	Aug.	1887	.12½
8	Atlantic, c.	Mich.	1,000,000	40,000	25	$280,000	April	1875	$1.00	700,000	Feb.	1891	1.00
9	Argenta, s.	Nev.	10,000,000	100,000	100	335,000	July.	1889	.10	40,000	Feb.	1880	.20
10	Argyle, g.	Colo.	1,000,000	1,000,000	1	*				20,000	Mar.	1892	.01
11	Aspen Mg. & S., s. l.	Colo.	2,000,000	200,000	10	*				680,000	April	1892	.10
12	Aurora, i.	Mich.	2,500,000	100,000	25					855,000	April	1891	1.00
13	Badger, s	Ont.	250,000	50,000	5					37,500	Mar.	1890	.25
14	Bangkok Cora-Bell, s.	Colo.	600,000	600,000	1	*				44,510	Aug.	1890	.00½
15	Belle Isle, s.	Nev.	10,000,000	100,000	100	190,000	Dec.	1889	.15	300,000	Dec.	1879	.25
16	Belcher, s. g.	Nev.	10,400,000	104,000	100	3,160,000	May	1892	.25	15,397,000	April	1876	1.00
17	Bellevue, Idaho, s. l.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25	200,000	Jan.	1890	.10
18	Bi-Metallic, s. g.	Mont.	5,000,000	200,000	25					1,800,000	Nov.	1891	.35
19	Bodie Con., g. i.	Cal.	10,000,000	100,000	100	550,000	June	1890	.25	1,602,572	April	1885	.50
20	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*				520,000	June	1886	.15
21	Boston & Mont., c. s.	Mont.	3,125,000	125,000	25	*				2,075,000	Nov.	1891	1.00
22	Breece, i.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
23	Brooklyn Lead, l. s.	Utah	500,000	50,000	10					127,000	July.	1887	05
24	Bulwer, g.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	185,000	April	1892	.10
25	Bunker Hill & S. s.l.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1888	.06⅔
26	Caledonia, g.	Dak.	10,000,000	100,000	100	505,000	May.	1885	.15	192,000	Oct.	1890	.08
27	Calliope, s.	Colo.	1,000,000	1,000,000						140,000	Jan.	1891	.00½
28	Calumet & Hecla c.	Mich.	2,500,000	100,000	25	1,200,000				37,350,000	June	1892	5.00
29	Catalpa, s. l. i.	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
30	Centen'l-Eureka, s.l.	Utah.	1,500,000	30,000	50					562,500	April	1892	.50
31	Central, c.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
32	Chrysolite, s. l.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
33	Clay County, g.	Colo.	200,000	200,000	1	*				56,000	Nov.	1891	.02
34	Cœur D'Alene, s. l.	Idaho	5,000,000	500,000	10					310,000	Nov.	1891	.02
35	Colorado Central, s.l.	Colo.	2,750,000	275,000	10	*				475,000	July.	1892	.05
36	Commonwealth, s.	Nev.	10,000,000	100,000	100	170,000	Nov.	1888	.50	20,000	Nov.	1890	.20
37	Confidence, s. l.	Nev.	2,496,000	24,960	100	1,575,000	Nov.	1891	.75	199,680	April	1889	1.00
38	Cons. Cal. & Va., s.g.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,682,800	Aug.	1891	.50
39	Contention, s.	Ariz.	12,500,000	250,000	50					†2,587,500	Dec.	1884	.25
40	**Cop. Queen Con., c.	Ariz.	1,400,000	140,000	10					210,000	Feb.	1889	.50
41	Cortez, s	Nev.	1,500,000	300,000	05	*				687,000	Mar.	1892	.50
42	Crescent, s. l. g.	Utah	15,000,000	600,000	25	*				228,000	Oct.	1888	.03
43	Crown Point, g. s.	Nev.	10,000,000	100,000	100	2,675,000	Mar.	1892	.50	11,898,000	Jan.	1875	2.00
44	Cumberland, l. s.	Mont.	5,000,000	500,000	10	*				15,000	Nov.	1889	.03
45	Daly, s. l.	Utah	3,000,000	150,000	20					2,400,500	May.	1892	.25
46	Deer Creek, s. g.	Idaho	1,000,000	200,000	5	*				20,000	June	1889	.05
47	Deadwood-Terra, g.	Dak.	5,000,000	200,000	25	*				1,110,000	June.	1892	.05
48	DeLamar, s. g.	Idaho	2,000,000	400,000	5					216,000	Jan.	1892	.18
49	Derbec B. Grav., g.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	260,000	Aug.	1891	.10
50	Dunkin, s. l.	Colo.	5,000,000	200,000	25	*				390,000	Oct.	1889	.05
51	Dunstone, g. s. l.	Mont.	1,000,000	200,000	5	*				6,000	Nov.	1888	.03
52	Eclipse, l. s.	Colo.	100,000	100,000	1					20,000	Nov.	1887	10
53	Elkhorn, s. l.	Mont.	1,000,000	200,000	5	*				¶658,500	Mar.	1892	.50
54	Enterprise, s.	Colo.	100,000	10,000	10	*				350,000	May.	1892	.10
55	Eureka Con., s. l. g.	Nev.	,000,000	50,000	100	550,000	June	1889	.50	5,017,500	Jan.	1892	.25
56	Evening Star, s. l.	Colo.	500,000	50,000	10	*				1,450,000	Dec.	1889	.25
57	Father de Smet, g.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	‡,125,000	Dec.	1885	.20
58	Franklin, c.	Mich.	1,000,000	40,000	25	220,000	June	1871		1,020,000	Jan.	1892	2.00
59	Freeland, s. g.	Colo.	5,000,000	200,000	25	*				190,000	July.	1886	.10
60	Garfield Lt., o. s.	Nev.	500,000	100,000	5					90,000	April	1888	.12½
61	Gould & Curry, s. g.	Nev.	10,800,000	108,000	100	4,591,200	June	1892	.25	3,826,800	Oct.	1870	10.00
62	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30	495,000	Mar.	1884	.25
63	Granite, s. l.	Idaho	500,000	500,000	1	*				83,400	Nov.	1890	.02
64	Granite Mountain, s.	Mont.	10,000,000	400,000	25					11,960,000	May.	1892	.20
65	Green Mountain, g.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
66	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,478,800	Mar.	1892	.50	1,822,000	Aug.	1888	.50
67	Hecla Con., s. g. l. c.	Mont.	1,500,000	30,000	50					1,815,000	May.	1892	.50
68	Hel'a Mg. & Red, s.l.g.	Mont.	3,315,000	663,000	5	*				197,970	July.	1886	.06
69	Holmes, s.	Nev.	10,000,000	100,000	100	370,000	May.	1890	.25	75,000	April	1886	.25
70	Homestake, g.	Dak.	12,500,000	125,000	100	200,000	July.	1878	1.00	4,853,750	June.	1892	.10
71	Honorine, s. l.	Utah.	500,000	250,000	2	37,500	April	1889	.05	125,000	Sept.	1887	.05
72	Hope, s.	Mont.	1,000,000	100,000	10	*				233,252	April	1888	.25
73	Horn-Silver, s. l.	Utah.	10,000,000	400,000	25	*				4,500,000	Mar.	1892	.12½
74	Hubert, g.	Colo.	1,000,000	1,000,000	1	*				247,000	Dec.	1889	.00½
75	Idaho, g.	Cal.	310,000	3,100	100					2,347,150	April	1892	1.00
76	Illinois, s.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
77	Iron Hill, s.	Dak.	2,500,000	250,000	10	134,000	July.	1889	.03	156,250	Nov.	1887	.07½
78	Iron Mountain, s	Mont.	500,000	500,000	1	*				110,000	Feb.	1892	.03
79	Iron-Silver, s. l.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
80	Jackson, g. s.	Nev.	5,000,000	50,000	100	237,500	Nov.	1880	.20	60,000	Jan.	1891	.10
81	Kearsarge, c	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	80,000	Jan.	1890	2.00
82	Kentuck, s. g	Nev.	3,000,000	30,000	100	454,180	Oct.	1891	.15	1,350,000	Dec.	1886	.10
83	La Plata, s. l.	Colo.	2,000,000	200,000	10	*				610,000	Sept.	1882	.30
84	Leadville Con., s. l.	Colo.	4,000,000	400,000	10	*				435,500	Dec.	1891	.03
85	Lexington, g. s.	Mont.	4,000,000	40,000	100	*				609,000	Jan.	1890	2.00
86	Little Chief, s. l.	Colo.	10,000,000	200,000	50	*				820,000	Dec.	1890	.05
87	Little Rule, s.	Colo.	500,000	500,000	1					220,000	Dec.	1891	.02
88	Mammoth, s. l. c.	Utah	10,000,000	400,000	250	110,000		1882	.25	1,040,000	Dec.	1891	.10
89	Martin White, s.	Nev.	10,000,000	100,000	100	1,275,000	Jan.	1892	.25	140,000	Dec.	1886	.25
90	Mary Murphy, s. g.	Colo.	350,000	3,500	101	*				175,000	May.	1888	5.00
91	Matchless, s. l	Colo.	500,000	500,000	1	*				15,000	Feb.	1890	.00½
92	May Mazeppa, s. l.	Colo.	1,000,000	100,000	1					205,000	Oct.	1891	.03¾
93	Minas Prietas, g. s.	Mex.	1,000,000	100,000	10	*				350,000	Dec.	1890	.50
94	Minnesota, c.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar.	1876	
95	Mollie Gibson, s.	Colo.	5,000,000	1,000,000	5					1,860,000	June	1892	.15
96	Monitor, g.	S. Dak	2,500,000	250,000	10					45,000	Oct.	1890	.03
97	Mono, g.	Cal.	5,000,000	50,000	100	760,000	Sept.	1890	.25	12,500	Mar.	1886	.25
98	Montana, Lt., g. s.	Mont.	3,300,000	660,000	5	*				2,619,075	June.	1891	12½
99	Morning Star, s. l.	Colo.	1,000,000	100,000	10					925,000	April	1891	.25
100	Moulton, s. g.	Mont.	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
101	Mount Pleasant, g.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
102	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00	210,000	July.	1891	.10
103	Napa, q.	Cal.	700,000	100,000	7					480,000	July.	1892	.20
104	Navajo, g. s.	Nev.	10,000,000	100,000	100	520,000	May.	1891	20	229,950	April	1889	.10
105	New California, g.	Colo.	800,000	160,000	5	*				48,800	May.	1890	.12½
106	New Guston, s.	Colo.	550,000	110,000	5					1,877,500	April	1892	.75
107	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
108	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	April	1883	.50
109	North Belle Isle, s.	Nev.	10,000,000	100,000	100	445,000	Aug.	1891	.25	230,000	May.	1888	.50
110	North Star, g.	Cal.	1,000,000	100,000	10					300,000	April	1889	.50
111	Ontario, s. l.	Utah.	15,000,000	150,000	100					12,875,000	May.	1892	.50
112	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	Jan.	1880	1.00
113	Original, s. c.	Mont.	1,500,000	60,000	25	*				138,000	Jan.	1889	.05
114	Oro, s. l. g.	Colo.	500,000	100,000	5					95,000	July.	1890	.20
115	Osceola, c.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,597,500	May.	1892	1.00
116	Parrot, c.	Mont.	1,800,000	180,000	10					1,514,000	April	1892	.10
117	Plumas Eureka, g.	Cal.	1,406,250	140,625	10					2,643,559	April	1892	.18
118	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
119	Quicksilver, pref., q.	Cal.	4,300,000	43,000	100					1,823,911	June	1891	1.25
120	" com., q	Cal.	5,700,000	57,000	100					643,867	July.	1882	.40
121	Quincy, c.	Mich.	1,250,000	50,000	25	200,000	Dec.	1862		6,170,000	Feb.	1892	4.00
122	Reed National, s. g.	Colo.	500,000	500,000	1	*				50,000	Dec.	1890	.01
123	Rialto, g.	Colo.	300,000	300,000	1	*				50,250	April	1892	.01½
124	Richmond, s. l.	Nev.	1,350,000	54,000	25	*				4,346,323	Aug.	1891	.25
125	Ridge, c.	Mich.	500,000	20,000	25	219,939	Mar.	1886	.50	99,785	Feb.	1880	.50
126	Robinson Con., s. l.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
127	Running Lode, g.	Colo.	1,000,000	1,000,000	1	*				36,000	May.	1892	.00 1-10
128	Savage, s.	Nev.	11,200,000	112,000	100	6,772,000	Feb.	1892	.50	4,460,000	June	1869	3.00
129	Sheridan, s. g.	Colo.	300,000	3,000	100	*				300,000	Oct.	1891	2.50
130	Shoshone, g.	Idaho	150,000	150,000	1					7,500	April	1883	.01
131	Sierra Buttes, g.	Cal.	2,225,000	122,500	10					1,507,257	April	1892	.12
132	Sierra Nevada, s. g.	Nev.	10,000,000	100,000	100	6,411,910	June	1892	.25	102,000	Jan.	1871	1.00
133	Sierra Nevada, s. l.	Idaho	1,000,000	1,000,000	1	*				40,000	May.	1889	.02
134	Silent Friend	Colo.	500,000	500,000	1					60,000	Aug.	1891	.02½
135	Silver Cord, s. l. g.	Colo.	4,500,000	450,000	10					265,000	April	1889	.10
136	Silver King, s.	Ariz.	10,000,000	100,000	100	130,000	Nov.	1890	.30	1,950,000	July	1887	.25
137	Silver Mg. of L.V., s.l.	N. M.	500,009	500,000	1					300,000	Dec.	1891	.05
138	Small Hopes Con., s.	Colo.	5,000,000	250,000	20	*				3,162,500	Oct.	1890	.10
139	Spring Valley, g.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan.	1881	.25
140	Standard, g. s.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	3,625,000	April	1892	.10
141	Stormont, s.	Utah.	500,000	500,000	1	*				155,000	Nov.	1881	.05
142	St. Joseph, l.	Mo.	1,500,000	150,000	10	*				1,974,000	Dec.	1890	.02
143	Tamarack, c.	Mich.	1,250,000	50,000	25	520,000	April	1885	3.00	2,960,000	June	1892	4.00
144	Tombstone, g. s. l.	Ariz.	12,500,000	500,000	25	*				1,250,000	April	1882	.10
145	United Verde, c.	Ariz.	3,000,000	300,000	10	*				207,500	Jan.	1892	.10
146	Viola Lt., s. l.	Idaho	750,000	150,000	5					337,500	Nov.	1888	.37½
147	Ward Con., s.	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
148	Woodside, s. l.	Utah.	100,000	100,000	10					25,000	Oct.	1889	.25
149	W. Y. O. D.	Cal.	30,000	15,000	2	22,500	May.	1891	.10	18,000	April	1892	.10
150	Yankee Girl, s.	Colo.	1,300,000	260,000	5					1,405,000	April	1891	.50
151	Yellow Jacket, g. s.	Nev	12,000,000	120,000	100	5,778,000	May.	1892	.25	2,184,000	Aug.	1871	2.50
152	Young America, g.	Cal.								175,000	Jan.	1884	10

NON-DIVIDEND PAYING MINES

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.		
1	Allegheny, s.	Colo.	$5,000,000	500,000	$10	*			
2	Alliance, s. g.	Utah	100,000	100,000	1	$120,000	Feb.	1891	.20
3	Allouez, c.	Mich.	2,000,000	80,000	25	737,000	Jan.	1890	.70
4	Alpha Con., g. s.	Nev.	3,000,000	30,000	100	112,500	Sept.	1890	.25
5	Alta, s.	Nev.	10,080,000	100,800	100	3,369,880	Jan.	1892	.10
6	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	June	1887	
7	Amity, s.	Colo.	250,000	250,000	1				
8	Anchor, s. l. g.	Utah.	3,000,000	150,000	20	410,000	June	1890	.20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5				
10	Astoria, g.	Cal.	200,000	100,000	2				
11	Barcelona, g.	Nev.	5,000,000	200,000	25	*			
12	Bechtel Con., g.	Cal.	10,000,000	100,000	100	173,500		1883	.10
13	Belmont, g.	Cal.	500,000	500,000	1	*			
14	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	April	1886	.10
15	Best & Belcher, s. g.	Nev.	10,080,000	100,800	100	2,279,275	Aug.	1890	.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	Brownlow, g.	Colo.	250,000	250,000	1				
19	Brunswick, g.	Cal.	2,000,000	400,000	5				
20	Buckeye, s. l.	Mont.	1,000,000	500,000	2				
21	Bullion, s. g.	Nev.	10,000,000	100,000	100	2,865,000	May.	1892	.25
22	Butte & Boston, c. s.	Mont.	5,000,000	200,000					
23	Calaveras, g.	Cal.	500,000	500,000	1	*			
24	Carisa, g.	Wy.	500,000	100,000	5	*			
25	Carupano, g. s. l. c.	Ven.	200,000	100,000	2	*			
26	Cashier, g. s.	Colo.	500,000	250,000	2	*			
27	Cherokee, g.	Cal.	1,500,000	150,000	10				
28	Chollar, s. g.	Nev.	11,200,000	112,000	100	1,540,000	Nov.	1889	.50
29	Cleveland, t.	Dak.	1,000,000	500,000	2	*			
30	Colchis, s. g.	N. M.	500,000	50,000	10				
31	Colorado Silver	Colo.	1,625,000	325,000	5				
32	Comstock Tun.	Nev.	10,000,000	100,000	100	35,000	Mar.	1887	.15
33	Con. Imperial, g. s	Nev.	5,000,000	50,000	100	2,062,500	Jan.	1892	.25
34	Con. New York, s. g.	Nev.	5,000,000	100,000	50	70,000	Nov.	1890	.15
35	Con. Pacific, g.	Cal.	6,000,000	60,000	100	198,000	June	1890	.10
36	Con. Silver, s.	Mo.	2,500,000	250,000	10				
37	Crescent, s. l.	Colo.	3,000,000	300,000	10	*			
38	Crocker, s.	Ariz.	10,000,000	100,000	100	160,000	Jan.	1892	.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	Decatur, s	Colo.	1,500,000	300,000	5	*			
43	Denver City, s.	Colo.	5,000,000	500,000	10	*			
44	Denver Gold, g.	Colo.	300,000	60,000	5				
45	Dickens-Custer, s.	Idaho	2,100,000	420,000	5				
46	Durango, g.	Colo.	500,000	500,000	1	*			
47	Eastern Dev. Co., Li.	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	Emmons, s. l.	Colo.	2,000,000	2,000,000	1				
52	Empire, s.	Utah.	10,000,000	100,000	100				
53	Eureka Tunnel, s. l.	Nev.	10,000,000	100,000	100	*			
54	Exchequer, s. g.	Nev.	10,000,000	100,000	100	890,000	Jan.	1892	.25
55	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	81,500	May.	1890	.25
56	Gogebic I. Syn., i.	Wis.	5,600,000	200,000	25				
57	Gold Cup, s.	Colo.	500,000	500,000	1	*			
58	Golden Era, s.	Mont.	2,000,000	200,000	10	*			
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 Con., g.	Mont.	3,000,000	300,000	10				
65	Harlem M. & M. Co., g.	Cal.	1,000,000	200,000	5				
66	Hartery Con., g.	Cal.	1,000,000	100,000	10	22,000	Oct.	1890	.05
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	Holywood	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	Ironton, i.	Wis.	1,000,000	40,000	25				
74	Iroquois, c.	Mich.	1,250,000	50,000	25				
75	J. D. Reymert, s.	Ariz.	10,000,000	100,000	100				
76	Julia Con., g. s.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1889	.10
77	Lacrosse, g.	Colo.	1,000,000	100,000	10	*			
78	Lee Basin, s.	Colo.	5,000,000	500,000	10	*			
79	Madeleine, g. s. l.	Colo.	750,000	750,000	1	*			
80	Mammoth Gold, g.	Ariz.	245,000	49,000	5	*			
81	Mayflower Gravel, g.	Cal.	1,000,000	100,000	10	585,000	Mar.	1890	.56
82	Medora, g.	Dak.	250,000	250,000	1				
83	Merrimac Con., g. s.	Colo.	5,000,000	500,000	10	*			
84	Mexican, g. s.	Nev.	10,000,000	100,000	100	2,892,960	May	1892	.25
85	Middle Bar, g.	Cal.	400,000	200,000	2	*			
86	Mike & Starr, s. c.	Colo.	1,000,000	200,000	5	*			
87	Milwaukee, s.	Mont.	500,000	500,000	1	12,500	May.	1891	.01
88	Monitor, g.	Colo.	100,000	000,000	1	*			
89	Mutual Mg. & Sm.	W'sh.	100,000	100,000	1	*			
90	Native, c.	Mich.	1,000,000	40,000	25				
91	Neath, g.	Colo.	1,000,000	100,000	10				
92	Nevada Queen, s.	Nev.	10,000,000	100,000	100	200,000	Oct.	1889	.25
93	New Germany, g.	N. S.	100,000	100,000	1	*			
94	New Pittsburg, s. l.	Colo.	2,000,000	200,000	10	*			
95	North Standard, g.	Cal.	10,000,000	100,000	100	20,000	Nov.		
96	Noonday	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
97	Oneida Chief, g.	Cal.	500,000	125,000	100	*			
98	Oriental & Miller, s.	Nev.	10,000,000	400,000	25				
99	Osceola, g.	Nev.	5,000,000	500,000	10	*			
100	Overman, g. s.	Nev.	11,520,000	115,200	100	4,001,840	May.	1892	.30
101	Park, s.	Utah.	2,000,000	200,000	10				
102	Peer, s.	Ariz.	10,000,000	100,000	100	180,000	Nov.	1891	.15
103	Peerless, s.	Ariz.	10,000,000	100,000	100	405,000	Oct.	1890	.15
104	Phœnix	Ariz.	500,000	500,000	1	*			
105	Phœnix Lead, s. l.	Colo.	100,000	100,000	1	*			
106	Pilgrim, g	Cal.	600,000	300,000	2	*			
107	**Pioche M.&R., s.g.l.	Utah.	20,000,000	2,000,000	10				
108	Potosi, s.	Nev.	11,200,000	112,000	100	1,573,000	Mar.	1890	.50
109	Prousite, s.	Idaho	250,000	250,000	1	*			
110	Puritan, s. g.	Colo.	1,500,000	150,000	10	*			
111	Quincy, c.	Colo.	3,000,000	300,000	10				
112	Rappahannock, g. s.	Va.	250,000	250,000	1	*			
113	Red Elephant, s.	Colo.	500,000	500,000	1	*			
114	Red Mountain, Ltd., s	Colo.	300,000	60,000	5	*			
115	Ropes, g. s.	Mich.	2,000,000	80,000	25	167,200	Feb.	1891	.50
116	Ruby & Dun., s. l. g.	Nev.	25,300	506	50				
117	Russell, g.	N. C.	1,500,000	300,000	5				
118	Sampson, g. s. l.	Utah.	10,000,000	100,000	100	288,15[illegible]	July.	1888	1.08
119	San Sebastian, g.	San S.	1,600,000	320,000	5	*			
120	Santiago, g	N. M.	5,000,000	500,000	10				
121	Silver Age, s. l. g.	U.S.C.	400,000	200,000	2				
122	Silver Queen, c.	Colo.	2,000,000	200,000	10				
123	South Bulwer, g	Ariz.	5,000,000	200,000	25	*			
124	South Hite	Cal.	10,000,000	100,000	100	100,000	May.	1881	.25
125	South Pacific	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
126	Stanislaus, g.	Cal.	500,000	100,000	5				
127	St. Kevin, s. g.	Cal.	2,000,000	200,000	10				
128	St. Louis & Mex., s.	Colo.	100,000	100,000	1	*			
129	St. Louis & St. Elmo.	Mex.	,000,000	500,000	10	*			
130	St. L. & St. Felipe, g.s.	Colo.	000,000	200,000	10				
131	St. L. & Sonora, g. s.	Mex.	[illegible],000	150,000	10				
132	St. Louis-Yavapai	Mex.	1,500,000	150,000	10				
133	Sunday Lake, i.	Ariz.	3,000,000	300,000	10	*			
134	Sullivan Con., g.	Mich.	1,250,000	50,000	25				
135	Sylvanite, s.	Dak.	600,000	200,000	3	*			
136	Taylor-Plumas, g.	Colo.	5,000,000	500,000	10	*			
137	Tioga Con., g.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.10
138	Tornado Con., g. s.	Cal.	10,007,00	100,000	10	295,000	May.	1888	25
139	Tuscarora, s.	Nev.	100,000	100,000	1	*			
140	Union Con., g. s.	Nev.	10,000,000	500,000	20	15,000	Oct.	1889	.10
141	Utah, s.	Nev.	10,000,000	100,000	100	2,360,000	June	1892	.25
142	Ute & Ulay, s. l.	Nev.	10,000,000	100,000	100	245,000	Aug.	1890	25
143	Whale, s.	Colo.	500,000	100,000	5	*			
144	Washington, c.	Colo.	500,000	500,000	1				
145	West Granite Mt., s.	Mich.	1,000,000	40,000	25				
146	Yuma, c. s. g.	Mont.	5,000,000	500,000	10	*			
147	Zelaya, g. s.	Ariz.	10,000,000	400,000	25				
148		C. A.	600,000	300,000	2	*			
149									
150									
151									

G. Gold. S., Silver. L., Lead. C., Copper. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. §The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000. Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia 1? 000,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ This company paid $190,000 before reorganization in 1890 **This company acquired the property of the Raymond & Ely Company which had paid $3,075,000 in dividends.

STOCK MARKET QUOTATIONS.

Aspen. June 13.

The closing quotations were as follows:

Agnes C	$
Argentum Junista	.95
Aspen Deep Shaft	.11
Aspen Contact	4.50
Best Friend	.22
Bimetallic	.35
Bushwacker	.31
Carbonate Chief	.11
Della S	
Homer & Alta	
Justice	.10
Little Annie	.23
Mollie Gibson	11.30
Nolan Creek	
Park, Mamie & Queen	
Pontiac	.16
Sheep Mountain S. & M. Co	.25
Smuggler	15.00
St. Joe & Mineral Farm	.17
Yellow Boy	.20

Baltimore, Md. June 16.

COMPANY.	Bid.	Asked.
Atlantic Coal	$	$100
Balt. & N. C.	.05	.13
Big Vein Coal		
Conrad Hill		
Cons. Coal	.27½	.29
Diamond Tunnel		.15
George's Creek Coal		
Lake Chrome	.10	.15
Maryland & Cbarlotte		
North State		
Silver Valley	.60@.65	70@80

Pittsburg, Pa.

Prices highest and lowest for the week ending June 16:

COMPANY.	H.	L.
Allegheny Gas Co	$	$
Bridgewater Gas Co	28.00	
Chartiers Val. Gas	12.95	11.00
Columbia Oil Co		
Consignee Mining Co		
Consolidated Gas Co		
East End Gas Co		
Fisher Oil Co	61.00	52.00
Forest Oil		
Hazlewood Oil Co		
Hidalgo Mining Co		
La Noria Mining Co	.30	.25
Luster Mining Co	9.63	9.00
Mansfield C. & C. Co		
Manufacturers Gas Co		
Nat. Gas Co. of W. Va		
N. Y. & Clev. Gas Coal Co.	51.50	50.00
Ohio Valley Gas Co		
Pennsylvania Gas Co	10 00	9 00
People's Natural Gas Co		
People's N. G. & P. Co	12.25	11.63
Philadelphia Co	18.50	18.00
Pine Run Gas Co		
Pittsburg Gas Co		
Red Cloud Mining Co	2.00	
Silverton Mining Co		
South Side Gas Co		
Sterling Silver Mining Co		
Tuna Oil Co		
Union Gas Co		
Washington Oil Co		
W'moreland & Camb		
Wheeling Gas Co	20.00	19.00
W'bouse E. Light	19.00	17.75
W'bouse Air Brake Co	135.00	122.50
W'house Brake Co., Ltd	95.00	85.00

St. Louis. June 15.

CLOSING PRICES.

	Bid.	Asked.
Adams, Colo	$	$1.10
American & Nettie, Colo	.50	.55
Bi-Metallic, Mont		20.00
Central Silver		.00½
Elizabeth, Mont	.50	.53¾
Granite Mountain, Mont	11.50	12.50
Hope	3.75	4.25
Leo		
Little Albert		.03
Montrose Placer, Colo		.10
Mickey Breen		
Pat Murphy, Colo		
Small Hopes, Colo		
Silver Age		
Silver Bell	.10	.17½
Yuma, Ariz		

Deadwood. June 11.

	Bid.	Asked.
Bullion	.06	.07
Caledonia	.75	.80
Calumet	.08	.10
Cambrian		.02
Cartbage	.01	.01½
Deadwood Terra		2.30
De Smet	.25	.30
Double Standard		.16
Elk Mountain	.00½	.01
Emmett	.01	.02
Equitable		.04
Florence		.06
Golden Reward		1.50
General Merritt	.08	.10
Harmony	.09	.10½
Hester A	.02	.03
Homestake	13 50	14.00
Hermit	.01½	.02½
Iron Hill		
Isadorah	.20	.25
Maggie	.07	.10
Monitor		.08½
Rainbow	.01½	.02½
Retriever		
Ross-Hannibal		
Ruby Bell		.22
Ruby Wilkes	.01	.02
Seabury-Calkins		.06½
Silver Queen	.02	.02½
Stewart		.15
Tornado	.12	
Troy		.01½
Uncle Sam		

Helena, Mont.

(Special report by SAMUEL K. DAVIS.)

Prices highest and lowest for week ending June 11, 1892:

	H.	L.
Bald Butte (Mont.)	$1.75	$1.50
Benton Group, Mont	.35	.25
Bi-Metallic, Mont	.55	.50
California (Castle), Mont	.20	.15
Champion (Oro Fino), Mont	.15	.10
Combination (Philipsb'g), Mont.	1.00	.92½
Copper Bell (Cataract), Mont		.05
Cornucopia, Mont	.25	.20
Cumberland (Castle), Mont	1.00	.90
Elizabeth (Phillipsburg), Mont	.45½	.42½
Florence (Neibart), Mont	.40	.30
Fourth of July, Wasb	.10	.08
Giengary (Butte), Mont	.65	.57½
Helena & Victor, Mont	1.50	1.25
Ingersoll, Mont	.15	.10
Iron Mountain (Missoula), Mont	.95	.90
Jersey Blue (Butte)	.10	.07½
Lone Pine Consolidated	3.00	2.75
Moulton, Mont	2.00	1.75
Poorman (Cœur d'Alene), Idabo	.95	.92½
Queen of the Hills (Neibart)	1.20	1.10
SouthernCross (DeerLodge), Mont		
Whitlach Union & MacIntyre	.25	
Yellowstone (Castle). Mont	.30	.25

Trust Stocks.

Special report by C. I. Hudson & Co., members New York Stock Exchange. The following are the closing quotations June 10:

CERTIFICATES.

Am. Cotton Oil, Com	$40	@$40¾
" " " Pfd	77	@ 77½
Am. Sugar Refineries, Com	95¾@	96¼
" " " Pfd	95½@	96
Distillers' & Cattle Feeders'	46⅞@	47
Linseed Oil	34	@ 34¾
National Cordage, Com	118¾@	118¾
" " Pfd	113¼@	114
National Lead Co	35¾@	36
" " " Pfd	90½@	91
" " Certificates		@
Standard Oil	162½@	163½
W. U. Beef Co	6	@ 11

Foreign Quotations.

London. June 9.

	Highest.	Lowest.
Alaska Treadwell	£2½	£1⅞
Amador, Cal	3s. 6d.	3s.
American Belle, Colo	3s.	2s. 6d.
Appalachian, N. C		
Can. Phosphate, Can		
Colorado, Coio	1s. 6d.	1s.
Cons. Esmeralda, Nev		
De Lamar, Idaho	27s.	25s.
Dickens Custer, Idaho	9d.	3d.
Eagle Hawk	3s.	2s.
East Arevalo, Idabo		
Eberhardt	1s.	6d.
Elkborn, Mont	£1 15-16	£1 13-16
Elmore, Idabo		
Emma, Utab	9d.	6d.
Esmeralda	1s.	6d.
Flagstaff, Utab	3s. 9d.	3s. 3d.
Garfield, Nev		
Golden Feather	17s.	16s.
Golden Gate, Cal	5s. 9d.	5s. 3d.
Golden Leaf, Mont	2s. 6d.	2s.
Golden River, Cal		
Guston	£2¾	£2⅛
Idaho		
Jay Hawk, Mont	10s. 6d.	9s. 6d.
Josephine, Cal		
Kohinoor, Colo		
La Luz, Mex	3s. 3d.	3s.
La Plata, Colo	1s.	6d.
La Valera, Mex		
Maid of Erin, Colo	20s.	17s. 6d.
Mammotb Gold, Ariz.	1s. 9d.	1s. 3d.
Mount McClelian	4s.	3s.
Montana, Mont	6s. 6d.	5s. 6d.
Mona Lake Gold		
New California, Colo		
New Consolidated		
New Eberbardt, Nev		
New Gold Hill, N. C		
New Guston, Colo		
New Hoover Hill, N.C.		
New Russell, N. C		
New Viola, Idabo		
Old Lout, Colo	£⅜	£1⅛
Parker Gold, N. C		
Pittsburg Cons., Nev		
Poorman	5s. 3d.	4s. 6d.
Plumas Eureka	£⅜	£1⅛
Richmond Con., Nev	£⅜	£1⅛
Ruby, Nev		
Sam Christian, N. C		
Sierra Buttes, Cal	£⅜	£1⅛
" Plumas Eur., Cal		
Silver King		
United Mexican, Mex	2s.	1s.
West Argentine, Coio		
Yankee Girl, Colo	9s.	8s.

Paris. June 2.

	Francs.
East Oregon, Ore	0.75
Forest Hill Divide, Cal	42.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	725.00
Lexington, Mont	135.00
" parts	3.00
Nickel, New Caledonia	950.00
Rio Tinto, Spain	422 50
" " oblig	520.00
" " "	510.00
Tharsis, Spain	125.00
Vieille-Montagne, Belgium	572.50

CURRENT PRICES.

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

Acid—Acetic, No. 8, pure, 1,040, ℔ lb	.05
Commercial, in bbls. and cbys	.016@.017
Carbonic, liquefied, ℔ lb	.30
Chromic, cbem. pure	.90
for batteries	.40
Hydrobromic, dilute, U. S. P	.25
Hydrocyanic, U. S. P	.45
Hydrofluoric	.20
Alcohol—95%, ℔ gall	$2.30@$2.40
Absolute	$3.80
Ammoniated	$2.80
Alum—Lump, ℔ lb	.016@.017
Ground, ℔ lb	.0165@.0175
Powdered	.04½@.05
Lump ℔ ton, Liverpool	£5
Aluminum Chloride—Pure, ℔ lb.	$1.25
Amalgamating solution, ℔ lb	.60
Sulpbate	.01¾@.03
Ammonia—Sul., in bbl. lots, ℔ lb.	.03@3.05
Carbonate, ℔lb., English and German.	.07¾
Muriate, wbite, in bbls., ℔ lb	.08½
Aqua Ammonia—(in cbys) 18° ℔lb.	.03@.01
20°, ℔ lb	.04@.05
26°, ℔ lb	.04¾@.05
Antimony—Oxymur, ℔ lb	.04¾
Regulus, ℔ ton, London	£42½@£43¾
Argols—Red, powdered, ℔ lb	.15
Arsenic—White, powdered ℔ lb.	.02½@.03
Red ℔ lb	.05@.065
Yellow	.08@.09
White at Plymouth, ℔ ton	£12 2 6
Asbestos—Canadian, ℔ ton	$50@$300
Italian, ℔ ton, c. i. f. L'pool	£18@£60
Ashes—Pot, 1st sorts, ℔ lb	4.75@5
Pearl	05.75@.06
Asphaltum—	
Prime Cuban, ℔ lb	.04@.05¼
Hard Cuban, ℔ ton	$28.00
Trinidad, refined, ℔ ton	$30.00
Egyptian, ℔ lb	.08@.09
Californian, at mine, ℔ ton	$12.00
at San Francisco, ℔ ton.	$15.00
Barium—Carbonate, pure, ℔ lb	.45
Carbonate, commercial, ℔ lb	.05@.10
Chlorate, crystal, ℔ lb	.75
Cblorido, commercial, ℔ lb	.05@.10
puro, ℔ lb	.16
Iodide, ℔ oz	.40
Nitrate, powdered, ℔ lb	.15
Sulph., Am, prime white, ℔ ton.	$18@$19
Sulph., foreign, floated, ℔ ton	$21@$23
Sulph., off color, ℔ ton	$11.50@$14.00
Carb., lump, f. o. b. L'pool, ℔ ton	.£6
No. 1, Casks, Runcorn, " "	£4 10 0
No. 2, bags, Runcorn, " "	£3 15 0
Bauxite—℔ ton	$10.00
Bichromate of Potash—Scotch, ℔ lb	.09¼@.10
American, ℔ lb	.09¼@.10
Bichromate of Soda—℔ lb	.08@.08¼
Borax—Refined, ℔ lb., in car lots.	.08@.08¼
San Francisco	.08¾
Concentrated, in car lots	.08@.08¾
Refined, Liverpool ℔ ton	£29
Bromine—℔ lb	.18@.25
Cadmium Minion—℔ lb	$2.00
Cadmium Iodide—℔ lb	$5.50
Chalk—℔ ton	$1.75@$2.00
Precipitated, ℔ lb	.05@.06
China Clay—English, ℔ ton	$13@$18.00
Southern, ℔ ton	$13.50
Chlorine Water—℔ lb	.10
Chrome Yellow—℔ lb	.10@.25
Chrome Iron Ore—℔ ton, San Francisco	$10.00
Chromalum—Pure, ℔ lb	.40
Commercial, ℔ lb	.12
Cobalt—Oxide, ℔ lb	$2.50@$2.90
Copper—Sulph. English Wks. ton	£20@£21
Vitriol (blue), ordinary	03¾@.03¾
" extra	.01¼
Nitrate, ℔ lb	.40
Copperas—Common, ℔ 100 lbs	.73@90
Best, ℔ 100 lbs	.85@$1.00
Liverpool, ℔ ton, in casks	£2
Corundum—Powdered, ℔ lb	.04½@.09
Flour, ℔ lb	.03
Cryolite—Powdered, ℔ lb., bbl. lots.	.07
Emery—Grain, ℔ lb. (℔ kg.)	.01½@.05
Flour, ℔ lb	.02½@.10
Epsom Salt—℔ lb	.01½
Feldspar—Ground, ℔ ton	$11.00
Crude	$5.25
Fluorspar—Powdered, No. 1, ℔ ton.	$30.00
French Chalk—	
Fuller's Earth—Lump, ℔ ton.	$20@$25
Glauber's Salt—in bbls., ℔ lb	.01@.0125
Glass—Ground, ℔ lb	.10
Gold—Cbloride, pure, crystals, ℔ oz.	$12.00
pure, 15 gr., c. v., ℔ doz.	$5.40
liquid, 15 gr., g. s. v., ℔ doz	$5.50
Cbloride and sodium, ℔ oz	$6.00
15 gr., c. v., ℔ doz.	$2.88
Oxide, ℔ oz	$27.25
Gypsum—Calcined, ℔ bbl	$1.25@$1.50
Land Plaster	
Iodine—Resublimed	$3.35@$4.00
Iron—Nitrate, 40°, ℔ lb	.01½
47°, ℔ lb	.02½
Kaolin—*See China Clay.*	
Kieserite—℔ ton	$9@$10
Lead—Red, ℔ lb	.06¾@.07¼
White, American, in oil, ℔ lb	.06½@.07¼
White, English, ℔ lb., in oil	.08½@.08¾
Acetate, or sugar of, white	.12@.13
Granulated	
Nitrate	.09@.10
Lime Acetate—Am. Brown	$1.00@$1.05
" Gray	$1.75@$1.87½
Litharge—Powdered, ℔ lb	.06½@.07½
English flake, ℔ lb	.09@.09½
Magnesite—Crude, ℔ ton of 1,015 kilos	$14.75
Calcined, ℔ ton of 2,240 lbs	$22.00
Brick, ℔ ton of 2,240 lbs	$47.50
Manganese—Ore, per unit	.23@.28
Oxide, ground, ℔ lb	.02½@.06½
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb	4.8
Powdered, ℔ lb	.54
Marble Dust—℔ bbl	$1.29
Metallic Paint—Brown ℔ ton.	$20@$25
Red	$20@$52
Mineral Wool—Ordinary slag	.01½
Ordinary rock	.02½
Ground, ℔ ton	
Mica—In sheets according to size.	
1st quality, ℔ lb	.25@$6.00
Naphtha—Black	
Nitre Cake—℔ ton	$10.00
Ochre—Rochelle, ℔ lb	$1.50@$1.55
Washed Nat Oxf'rd, Lump, ℔lb.	.06½@.06¾
Washed Nat Oxf'rd, Powder, ℔lb.	.07@.07½
Golden, ℔ lb	.03¾@.04
Domestic, ℔ lb	.0¾@.01½
Oils, Mineral—	
Cylinder, light filtered, ℔ gal	.15@.20
Dark filtered, ℔ gal	.12@.15
Extra cold test, ℔ gal.	.18@.20
Dark steam refined, ℔ gal.	10@.18
Phosphorus—℔ lb	.55@.60
Precip., red, ℔ lb	.88
wbite, ℔ lb	.93
Plumbago—Ceylon, ℔ lb	.04@.05
American, ℔ lb	.05@.07
Potassium—Cyanide, ℔ lb., C. P. 67%, ℔ lb	.70
50%, ℔ lb	.45
Bromide, domestic, ℔ ib	.40
Chlorate, English, ℔ ib	.23@.25
Chlorate, powdered, English, ℔ lb.	.13@.13¼
Carbonate, ℔ lb., by casks, 82%	.13½@.13½
Caustic, ℔ lb., pure slick	.04½@.05¾
Iodide, ℔ lb	.06@.07
Nitrate, refined, ℔ ih	$2.58@$2.63
Bichromate, ℔ lb	.06@.08
Yellow Prussiate, ℔ lb	.095@.10
Red Prussiate, ℔ lb	.23½@.24¼
Pumice-Stone—Select lumps, lb.	.40@.45
Original cks., ℔ lb	.04@.12
Powdered, pure, ℔ lb	.01¾@.02¼
Pyrites—Non-cupreous, p. units.	.12@.15
Quartz—Ground, ℔ ton	$12.50@$17.50
Rotten Stone—Powdered, ℔ lb	.03¼
Lump, ℔ lb	.06@.07
Original cks, ℔ lb	.04½@.05½
Rubbing stone, ℔ lb	.10
Sal Ammoniac—lump, in bbls., ℔ lb.	.80½
Salt—Liverpool, ground, ℔ sack	.700
Domestic, fine, ℔ ton	$7@$7.5
Common, fine, ℔ ton	$4.50@$5
Turk's Island, ℔ bush	.26@.28
Salt Cake—℔ ton	$10.00
Saltpeter—Crude, ℔ lb	.03¾@.04¼
Soapstone—	
Sodium—Prussiate, ℔ lb	.17½@.18
Phosphate, ℔ lb	.07@.18
Stannate, ℔ lb	.08@.15
Tungstate, ℔ lb	
Hyposulphite, ℔ lb., in casks.	.0235@.0245
Strontium—Nitrate, ℔ lb	.09½@.10
Sulphur—Roll, ℔ lb	.02¼
Flour, ℔ lb	.02¾
Sylvite, 23@27%, S.O.P., per unit.	40@.42½
Talc—Ground French, ℔ lb	.01¼@.01¾
Terra Alba—French, ℔ lb	.75@.80
English, ℔ lb	.70@.75
American, No. 1, ℔ lb	1.00
American, No. 2, ℔ lb	.40@.50
Tin—Crystals, in kegs or bbls	.14@.15
feathered or flossed.	.25
Muriate, single	.07
Double or strong, 54° B	.10
Oxy. or nitro	.19
Tin Plates, ℔ box, Swansea, best charcoal	.18@.19
best coke	.15@.16
Vermilion—Imp. English, ℔ lb.	.90@.9
Am. quicksilver, bulk	.65
Am. quicksilver, bags	.68 @ .72
Chinese	.95 @$1.00
Trieste	.90 @ .95
American	11¼@ .13
Zinc White—Am., Dry, ℔ lb	.04½@ .05
Antwerp, Red Seal, ℔ lb	.07½
Paris, Red Seal, ℔ lb	.07½@.07¾
Muriate solution	.06
Sulpbate crystals, in bbls., ℔ lb.	.03¾

THE RARER METALS.

Aluminum—℔ lb	50@.65
Arsenic—(Metallic), per ib	.40
Barium—(Metallic), per gram	$4.00
Bismuth—(Metallic), per ih	$2.40
Cadmium—(Metallic), per ib	$1.00
Calcium—(Metallic), per gram	$10.00
Cerium—(Metallic), per gram	$7.50
Chromium—(Metallic), per gram	$1.00
Cobalt—(Metallic), per lb	$6.00
Didymium—(Metallic), per gram	$9.00
Erbium—(Metallic), per gram	$7.50
Gallium—(Metallic), per gram	$140.00
Glucinum—(Metallic), per gram	$12.00
Indium—(Metallic), per gram	$9.00
Iridium—(Metallic), per oz	$7.00
Lanthanum—(Metallic), per gr.	$10.00
Lithium—(Metallic), per gram	$10.00
Magnesium—(Powdered), per ib.	$4.00
Manganese—(Metallic), per ib	$1.10
Chem. pure, per oz.	$10.00
Molybdenum—(Metallic), per gm	.50
Niobium—(Metallic), ger gram	$5.00
Osmium—(Metallic), per oz	$65.00
Palladium—(Metallic), per oz	$35.00
Platinum—(Metallic), per oz.	$7.00@$9.00
Potassium—(Metallic), per lb	$28.00
Rhodium—(Metallic), per gram	$5.00
Ruthenium—(Metallic), per gm.	$5.50
Rubidium—(Metallic), per gram	$2.00
Selenium—(Metallic), per oz	$1.80
Sodium—(Metallic), per lb	5@.75
Strontium—(Metallic), per gm	.60
Tantalium—(Metallic), per gram	$9.00
Telurium—(Metallic), per lb	$5.00
Thallium—(Metallic), per gram	.20
Titanium—(Metallic), per gram	$2.20
Thorium—(Metallic), per gram	$17.00
Tungsten—(Metallic), per lb	.80
Uranium—(Oxide), per lb	$5.00
Metallic, per gm	.20
Vanadium—(Metallic), per gm	$22.00
Yttrium—(Metallic), per gram	$9.00
Zirconium—Metallic), per oz	$65.00