THE ENGINEERING AND MINING JOURNAL
AND
COAL

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

VOL. XLVI. SEPTEMBER 8. No. 10.

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

Cable Address: "Rothwell," New York.

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

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1455, New York. Articles written by Mr. Raymond will be signed thus *: and only for articles so signed is he responsible.

The following gentlemen are authorized to receive advertisements and subscriptions for the ENGINEERING AND MINING JOURNAL:

Mr. J. Viennot, 504 Walnut street, Philadelphia.
Mr. C. David, Duluth, Minn.
Mr. Morgan Robertson, 195 Wabash avenue, Chicago.
Mr. O. J. Frost, care Boston & Colorado Smelting Co., Clayton Block, Denver, Colo.
Mr. L. P. Fisher, 21 Merchants Exchange, San Francisco, Cal.

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

PERU, SOUTH AMERICA.—Mr. John Newton, No 2 Calle Constitucion, Callao, Peru.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders, or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING COMPANY.

Advertising Rates.—See page XIII.

THE SCIENTIFIC PUBLISHING CO., Publishers,
P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

THE Arkansas investors who have been misled and taken in by the charlatans who have pretended to get great assays of gold and silver out of barren rock, are greatly exercised over the exposure made by the Geological Survey of the State.

It is perhaps not altogether unreasonable to expect that these people, who understand nothing of the subject and who invested on faith in the statements of these "experts," should still cling to them in the hope that they are right and the State geologists wrong.

We would, therefore, repeat our suggestion that the parties interested employ some well-known expert or experts who command confidence, and have them accompany the State Geologist's assistant, Professor COMSTOCK, who examined the mines which have been condemned in Dr. BRANNER'S report, and let them together sample the mines and make a report which will settle the question at issue.

The reputations of some of the "experts" who have been chiefly instrumental in getting up the Arkansas boom are extremely unsavory; but at the same time the question of fact as to whether the mines denounced by Dr. BRANNER are good or worthless, may be settled in an authoritative way by the parties interested by a small expenditure, which they should have made long ago. It cannot be settled against men who stand so high in the profession as Dr. BRANNER and Professor COMSTOCK by any amount of abuse.

THE WORLD'S SILVER MARKET.

There have appeared during the week in our daily contemporaries various telegrams from the city of Mexico which have attracted considerable attention on account of the ambitious project to which they refer. We think, however, the newspaper correspondents must have been misinformed as to the views of the purchasers of the Mortgage Bank of Mexico, with regard to their supposed idea that, by the aid and intervention of this bank issuing silver certificates against the deposit of silver bullion, they would be able to transfer the market for silver from London to New York. It is almost impossible to believe that sober, serious men of business could entertain this notion; for it must be plain to any one who has studied the subject that the real market for silver is India and the East, and that as long as the enormous balances of account between England and India are settled in London by Government drafts on the Indian Treasury, so long will the silver market be ruled by the London rate of exchange on India. This is thoroughly recognized in Europe, and the large financial houses and banks in France and Germany bid for these Council drafts, as they are called, to enable them to settle their balances with the East. There is no likelihood of the Indian Government changing this method of transferring balances, for it has been found convenient and satisfactory for many years.

The United States has such small transactions with India or other silver consuming countries there is no important call for Eastern exchange here, and no one can imagine a market price for the metal being established for the world by a country that is not a purchaser and is but a small exporter of the metal. In 1887, the excess of our exports of silver over our imports of the metal amounted to only $9,000,000, while during the same period London exported to the East nearly $30,000,000, which, with much she used herself, was bought from various producing countries.

THE COST OF TIMBER IN MINING.

Practical miners, in estimating the value of an ore-deposit attach a good deal of importance to such elements as the hardness of the vein-matter and country-rock; the way it breaks in blasting; the amount of water that will probably be encountered, and the cost of the timber necessary for mine-supports. Even in the same districts, different mines may vary so much in these factors of cost as to invalidate all estimates based upon general conditions only; and many an expert report, in which the most accurate assays of the most carefully taken samples are most honestly reported, leads to disappointment because the mine proves "so expensive to work."

How enormous the item of expense for mine-timber may become, the reports of the Comstock mines abundantly show. We are indebted for a confirmation of this proposition to Mr. S. F. PARRISH, General Manager of the Chrysolite Company, at Leadville, a locality in which the Nevada system of square timbering has been, perhaps unavoidably, followed.

Mr. PARRISH estimates that the Chrysolite mine has used, in twelve years, 19,890,864 feet, board measure, of timber, 200,000 feet above ground and the vast remainder under ground. This has been largely in logs, 12 feet long, squaring 12 by 12 inches. It has cost at the mine $138,135.

It would be, however, unfair to leave the impression that this large consumption of timber by a single mine represents a corresponding destruction of forest. Windfalls and forest fires furnish the greater part of such a supply—in other words, it is largely dead wood, the utilization of which is not a waste of natural resources. Moreover, such mines as those of Leadville and Virginia City are extreme and exceptional in their great consumption of timber. The Nevada system is confessedly the most wasteful in this particular that has ever been practiced.

The recent papers on this subject before the Institute of Mining Engineers have shown clearly that, in many cases at least, the adoption of such a system, though considered, by mining captains who know nothing better, to be imperatively required by the conditions, is in reality as unnecessary as it is expensive and unsafe. It is certainly the duty of American mining engineers to study this subject thoroughly, and to reduce to a minimum the burial of timber in mines. *

THE VOLATILIZATION AND AGGLOMERATION OF GOLD IN ROASTING.

The literature of this interesting and highly important subject, which was discussed in the ENGINEERING AND MINING JOURNAL, August 15th and 22d, 1885, has received a valuable contribution in the form of a paper to the American Institute of Mining Engineers by Prof. S. B. CHRISTY, of the University of California. So important, in fact, are Professor CHRISTY'S investigations that we republish in full the first part of his paper.

It has long been known that very heavy losses of gold occur in roasting certain gold ores with salt, but not until recent years have engineers fully appreciated the extent of this loss, nor has its cause been fully

known. Professor CHRISTY'S investigations, which show a loss in gold and silver, amounting in cases to 35 and 37 per cent respectively, will, therefore, explain many mysterious losses which have brought discredit on otherwise good practice.

Professor CHRISTY mentions, as a "curious fact," that the buttons of gold, when they "came in contact ever so lightly, at a temperature considerably below a red heat, were welded together at the points of contact."

In our own practice we have found this "curious fact" assume a very important practical bearing. We have already called attention to this on several occasions. In roasting arsenical pyrites for subsequent chlorination in barrels at a works under our management, the roasting was done in a single revolving cylinder, about 30 feet in length, the ore passing twice and sometimes three times through it before it was thoroughly roasted, each pass occupying about one hour. The gold was extremely fine and the extraction very perfect, reaching on concentrates as much as 98 and 99 per cent of the assay value. A second furnace was subscquently added, so as to take the ore hot from the first and finish the roast in a single operation. This furnace was 62 feet long, and the ore remained in it at a red heat for about three hours.

Assays showed that the tailings commenced to run very much higher as soon as the new furnace was operated, and as the roast was exceptionally perfect and much better than before, the explanation had to be sought elsewhere. Panning the tailings showed more coarse gold than had ever before been observed at the mine, and it was at first supposed that a streak of coarse gold had been met with, but none was seen in the ore, though the coarse gold in the tailings continued.

Examining this coarse gold under a glass the grains had all the appearance of having been fused together, and such, in fact, was the case, as Professor CHRISTY also found. The loss of gold too coarse to chlorinate was very serious, and was only overcome by running the tailings from the chlorinator over riffles and catching the coarse gold, which, being very clean and bright, amalgamated in about one third of the time required to amalgamate the roasted ore before passing through the chlorinator.

THE "NEW" CHLORINATION PROCESSES FOR GOLD EXTRACTION.

We have several times referred to the Newbery-Vautin process, which is so much vaunted in the English press, as something new and as superior to all previous chlorination methods, and we now notice in a recent issue of the London *Mining Journal* an account of a still newer process "invented" by Mr. HOLMS POLLOCK, of the Chemical Staff at the University of Glasgow, which claims superiority over the Newbery-Vautin. The apparent financial success of this latter company has no doubt stimulated the ambition of others, but we have yet to see an authentic report of as good work done by the Newbery-Vautin process as has been done here by even the old Plattner process. The success, so far as it appears in the published statements, consists in having promoted other companies, and in having sold patent rights to their own offspring. One of these offshoots has established itself in Denver, Colo., and proposes buying ore and working custom ore of a refractory character.

Since this so-called Newbery-Vautin process is nothing more nor less than the old Mears process—air being pumped into the revolving barrel to get pressure which MEARS obtained by chlorine gas—and as we have thoroughly demonstrated at several works in this country that pressure has no influence or advantage in the chlorination, but on the contrary involves expense and complication, and is not patentable if it were advantageous, there is little chance of any one in this country paying royalty to the Newbery-Vautin Company. The process of chlorinating in a revolving barrel is very quick and efficient, and there is no difficulty in washing and filtering the charge, either by using a leaky vacuum pump, as Newbery-Vautin do, or by simpler methods used here for some years past. There is, therefore, a field for such works at Denver, and we trust they will be successful as a custom works. They will scarcely pay the enormous dividends the stockholders expect, but, well managed, they should pay reasonable profits.

As we have already stated, the process is good though the patents are worthless, and no one who wants to use chlorination with or without pressure need hesitate to do so. Mr. ADOLPH THIES, of the Haile mine, S. C., or Mr. JOHN E. ROTHWELL, of the Brunswick Antimony Company, Glenwood, Mass., have long worked the process with and without pressure, and can be consulted regarding it.

The preceding remarks will apparently hold good concerning the Pollock process, which proposes to chlorinate under a still higher pressure obtained by hydraulic means. This pressure is said to be 100 pounds before revolving the chlorinator; what it is after the generation of the gases,—not always chlorine nor condensible,—is not stated. The chlorine is said to be obtained from "bleach" (chloride of lime) and bisulphate of soda. There is a chance reference to sulphuric acid in another part of the paper, so this is probably also the same as the Mears process.

It is stated that it would not pay to work the process on anything less than ½ oz. tailings, so that even the inventor's claims cannot compare in economy with the practice in this country, where $3.50 a ton has been found to cover all expenses.

HOW TO MAKE EXPLOSIVES FLAMELESS.

A discovery which, if substantiated, will prove for coal mining one of the most important that has been made in recent years, has just been announced. It is the secret of making explosives flameless.

So many disastrous explosions of fire-damp and of coal dust, singly or together, have been traced to shot-firing, that in some countries the use of explosives in coal mines producing fire-damp or explosive coal dust has been altogether prohibited. The cost of "getting" coal was so much reduced by the use of explosives that an immense amount of ingenuity has been expended in seeking an efficient substitute for these economical though dangerous agents. Water cartridges, *e. g.* in which the explosive is inclosed in a cartridge filled with water, so that the flame is quenched at once, while water being incompressible, the pressure of the gases on the small cartridge is extended undiminished in every direction by the water. The cooling effect of the water, of course, considerably lessens the efficiency of the explosive, and the whole arrangement is too complicated and expensive ever to become popular. Moreover, its adoption requires the boring of larger holes than where the explosive alone is used.

The use of wedges of various kinds has been suggested, and, some of these devices have even met with a measure of success, though they are more expensive than explosives and require heavier undercutting. The lime cartridge was also proposed and is actually in use in some English collieries, but this is slow, and requires a pump, and moreover the experiments made with it in our Pennsylvania anthracite mines were not satisfactory, the expansion of the lime not being sufficiently great to break out the coal.

Recently much has been said of the use of "flameless explosives," and carbonite and roburite have so far established their claims to this definition that their use has been permitted in the German collieries. It seems, as stated by Mr. G. G. ANDRÉ in the *Colliery Guardian*, that by the admixture of a suitable ingredient these, and, as it now appears, all explosives may, with little expense, be rendered flameless, and therefore free from danger, even in an atmosphere of fire-damp.

The mere statement of this fact must have an absorbing interest to our coal miners, and its verification will have a marked effect on the cost of mining in some districts. It is, in fact, not too much to say that it is one of the most important discoveries that has been made in recent years.

Messrs. MALLARD and LE CHATELIER, members of a French commission appointed to investigate the causes of explosions in coal mines, and to suggest means for preventing them, have reported to the French Académie des Sciences some of the results of their investigations, which they claim show clearly that *explosives will ignite dangerous mixtures of fire-damp only when the temperature of explosion exceeds* 2200 *degrees centigrade, say* 3920 degrees Fah.

Nobel gives the temperature of explosion of ordinary gunpowder as about 2231 degrees C.; nitro-glycerine, 3170 degrees C.; dynamite, 2940 degrees C.; gun cotton, 2636 degrees C. These are, therefore, all dangerous, but by adding some substance to the charge that will bring down the temperature of explosion below 2200 degrees C., Messrs. MALLARD and LE CHATELIER claim all danger is removed. A long series of experiments are stated to have proved that the addition of an equal weight of either the carbonate or the sulphate of soda to dynamite effects this, and renders it a safe explosive in a fiery atmosphere. The addition of a considerable quantity of *finely powdered coal dust* is said to produce the same effect.

The reduction of the temperature of explosion necessarily reduces the efficiency of the explosive, but it is claimed that the addition of nitrate of ammonia (80 parts) to dynamite or nitro-glycerine (20 parts) lessens this loss of efficiency.

It is scarcely possible to overestimate the importance of these discoveries, and we trust our manufacturers of explosives will at once investigate the subject, and give us the results of their experiments.

OUR SEACOAST DEFENSES.

Besides the quality of comprehensive grasp which we noted in our review (August 25th) of the lectures of Gen. ABBOT, they are remarkable for the skilful use of mathematics to determine the relative value of different elements of defense. As a sample of his method, we may take his discussion of the question, How should one million dollars be expended in purchasing and placing in position 12-inch 50-ton rifles? The outline of this discussion is as follows:

Evidently one extreme would be to pay as much for guns and as little

for mounting as possible. This would give a maximum number of guns, standing on the shore on simple barbette carriages, to be loaded by hand, without protection.

The other extreme would be to mount one gun with all the facilities for rapid loading and all the means of protection which the remainder of the million would buy.

To determine between these limits the most judicious investment of the sum named, three fundamental principles are assumed: first, that the object sought is the maximum number of well-directed shots fired against the enemy during the engagement; secondly, that the economical value of a gun-carriage and mounting is directly proportional to the number of shots it permits to be so fired (not exceeding the limit of safe endurance of the gun); thirdly, that the economical value of an artificial protection for the gun and carriage is inversely proportional to the dangerous area through which it permits the shot of the enemy to reach essential parts of the mechanism.

The succeeding calculation involves as elements: the duration of the engagement; the minimum interval between shots which the gun will endure: the intervals between shots, loading by hand; the same, loading by stored power; the areas of target presented by an unprotected and a protected gun and carriage, respectively; the interval which will elapse before the enemy can, by his fire, disable each; the cost of a 12-inch 50-ton gun, mounted without protection, on a hand-loading carriage; and the sum available for purchase and mounting as aforesaid. From these are deduced the number of guns that should be mounted with this sum: the maximum percentage of the prime cost of each gun that may be economically spent in increasing the rapidity of fire; and the maximum percentage for cover of gun and carriage.

The result of the calculation is a table, giving an economic comparison of different mountings, which is, of course, not offered as applicable without modification to local conditions, but is well adapted to serve, together with the discussion which precedes it, as a model for the solution of each special problem under the general case. From this table, it appears that $1,000,000 would be best expended in mounting 5·9 guns with the "Duane lift;" or, next to that, in mounting 8·7 guns with the King disappearing carriage—the smaller number of guns in the former case being slightly more than balanced by the greater length of probable life before disablement. The extreme case of guns without cover would give fourteen guns: but, the efficiency of this defense being estimated at unity, the Duane lift and the King carriage would stand at 3·4 and 3·2 respectively.

This demonstration, the character of which we have thus barely indicated, would be wholesome reading for the amateurs who are vociferating, "What we want is"— this, that or the other. What we really want is a very large sum of money to be expended honestly and under competent direction; and, since this cannot possibly be done all at once, we want just such intelligent and disinterested discussion as Gen. ABBOT has given us, to determine what shall be done first, and how the most can be got in the way of effective defense from the expenditures as they proceed.

It is quite likely that on one or another point Gen. ABBOT'S conclusions might be shown to need modification. They are avowedly only provisional. But his method is the right one. He takes the money-question into the problem, as a scientific engineer should do; and the assumptions which he finds it necessary to make are not purely arbitrary, but carry with them the weight of a wide acquaintance with the literature of modern warfare. *

NEW PUBLICATIONS.

NOTES FOR A HISTORY OF LEAD. By WILLIAM H. PULSIFER. D. Van Nostraud. 1888. Price, $4.00.

There is great modesty in the pretension of this admirable book to offer no more than *notes* for a future work. What the completed treatise would be one can imagine from these four hundred and ninety pages, in which the development of the lead industry from the remotest times is traced, with a mass of detail and incident which answers almost every question that could be asked respecting myth and reality of its manufacture and use. The amount of research preceding the preparation of the book has been enormous, and the only suggestion of incompleteness is an occasional lack of connection between the facts as they are brought forward. But method is far from wanting, and a copious index compensates for any deficiency that may exist.

The legendary and the historical in relation to lead in ancient times, the lead pipes of Italy, the great siphons carrying water over the valleys from Mount Pila, leaden roofs, coins and dice, slings, seals and furniture, the early use of solder and pewter, the development of the great lead mines of all ages, the manufacture of white lead and lead oxides, exemplify the wide range of subjects treated.

The major portion of the book is devoted to white lead, which was an article of manufacture even in remote periods of the world's history. It is interesting to observe that the conditions essential to success were very early known. Instructions given by Theophrastus, Vitruvius, Pliny, Dioscorides, and others, show that they clearly understood the necessity for suspending the lead to be converted into "ceruse," or lead carbonate, above the vinegar, where corrosion could occur only from the rising vapor. The need of carbonic acid to reconvert the acetate of lead, which would be formed at first, into the carbonate, was not known until more recent times, but it appears that the ancients mixed wine lees with the vinegar, which, by their decomposition, furnished, unknown to them, the requisite carbonizing gas. As early as the second century Galen announced that the vessels of vinegar and lead should be buried in dung, in order to supply heat.

The common modern or "Dutch process" Mr. Pulsifer shows to be falsely attributed to Holland. The Venetians practiced the same method a century earlier, and their product continued to maintain a favorable reputation, while the adulterated articles of Holland and England fell into disrepute for purposes where purity was a great desideratum.

The history of the white lead industry in the United States is given in detail from its beginning under the management of the Wetherills, of Philadelphia, down to the establishment of the great companies of the present time, whose works consume one third of the entire domestic output of the raw material. The early history of lead mining in this country is also given, with all its attendant romance of Indian opposition. The metallurgy of lead is rather too briefly glanced at, and perhaps this is one of the departments of the book in which future enlargement is contemplated. The work has an enduring quality in its compendious assemblage of facts, in addition to which it should be said that the style is often unusually graceful and felicitous, so that it may appeal even to those outside the pale of the profession as thoroughly readable and entertaining.

THE MINING MANUAL FOR 1888. By Walter R. Skinner. London. Price, 7s. 6d.

This is a most complete handbook for any one wishing information on the subject of mining as carried on under the Limited Liability Joint Stock laws of England. Although only the second year that this manual has been issued, the author has succeeded in making his information most ample and brought down to very recent date. It possesses an accurate index, and in addition to this the names of the companies are arranged in alphabetical order, so that the book is almost an index itself. There is a sketch of the history of each company, and the most recent authentic information, either from the half-yearly report or some official circular; also latest price of shares, dividends, capital, and other items of information. Without including the South African mines, 900 companies are referred to, and they have a nominal capital of £100,644,610, and a paid up capital of £58,454,733. These figures alone give a good idea of the importance of the mining interests in Great Britain. A separate section is devoted to mining interests at the Cape, Natal, and the Transvaal, and in this are included 396 companies, of which 145 have offices in London, with a nominal capital of £23,205,615, and a paid-up capital of £15,846,430.

PRODUCTION OF METALS IN PRUSSIA IN 1887.

PRODUCTS.	Amount.	Value.	
	Tons.	Marks.	Dollars.
Pig iron	2,838,587	123,041,567	30,760,393
Charcoal pig	25,029	3,005,958	751,490
Spelter	130,445	36,583,650	9,145,913
Pig lead	88,806	21,012,403	5,253,101
Litharge	3,727	859,200	214,800
Copper (ingot)	18,381	16,132,807	4,033,202
Black copper	19	6,200	1,550
Copper matte	396	166,650	416,663
Silver, kilos.	253,131	30,641,175	7,660,294
Gold, kilos	82	230,585	57,896
Nickel	254	1,018,000	254,500
Smalt	33	507,000	126,750
Cadmium, kilos	7,310	48,497	12,124
Chloride of tin	200	350,000	87,500
Bismuth	31	477	119
Antimonial alloys, kilos	44	21,823	5,456
Manganese	12	37,500	9,375
Arsenic	598	114,060	28,515
Sulphur	2,050	225,357	56,339
Sulphuric acid	267,750	8,716,473	2,179,118
" " fuming	20,204	472,594	118,149
Copperas	6,418	211,126	52,782
Sulphate of copper	1,808	495,863	123,951
Mixed sulphates of iron and copper	251	30,025	7,506
Sulphate of zinc	720	45,492	11,373
Sulphate of nickel	26	5,000	1,250
Colored earths	322	12,267	3,067
Total, tons	3,406,080	243,991,690	60,997,923
" kilograms	240,554		

* Mark counted at 25 cents.

Purification of Mercury.—The following process for the purification of mercury has been in use for some years at the Physical Institute at Kiel with the best results. The mercury containing chemical and mechanical impurities is poured into a glass tube, into the lower end of which is cemented a piece of bamboo cane which acts as a filter. The mercury passes through this into a larger glass tube almost entirely filled with dilute nitric acid (1 in 50), and on leaving this bath is sufficiently pure for some purposes. The distilling apparatus to prepare chemically pure mercury consists of a glass tube about 15 mm. wide and 80 cm. long, at top of which is a bulb of about 6 cm. diameter. The open end of this tube is placed in an inverted bottle with the bottom knocked out. Through the cork in the neck of this bottle is passed a second tube about 1 cm. wide and 145 cm. long, which passes through the other wider tube and up into the bulb at the top of it. This narrower tube is also contracted into a capillary one about 40 cm. from the top, and at the lower end is bent upward. To work the apparatus the wide tube and bulb are filled with mercury and inverted, which creates a vacuum in the bulb, and more mercury is poured gradually, drop by drop, into the narrow tube to increase it, and the apparatus then acts like a Sprengel pump. The bulb is then heated by the flame from a circular burner, and distillation takes place continuously, the absolutely pure mercury flowing out at the bent-up end of the smaller tube. Unless the atmospheric pressure varies greatly, the apparatus can be left at work night and day, and only requires the addition of mercury two or three times in 24 hours.

THE SULPHUR MINES OF SICILY.

(*Concluded from Page 175.*)

GRADE OF THE ORE AND EXTRACTION OF THE SULPHUR.

The ore for fusion of the first grade as to yield contains from 20 to 25 per cent of sulphur, that of the second grade from 15 to 20 per cent, and of the third grade 10 to 15 per cent. The usual means adopted for extracting sulphur from the ore is heat, which attains the height of 400 degrees centigrade, smelting with the kiln, which in Sicilian dialect is called a "calcarone." The "calcarone" is capable of smelting several thousand tons of ore at a time and is operated in the open air. Part of the sulphur is burned in the process of smelting in order to liquefy the remainder. "Calcaroni" are situated as closely to the mouth of a shaft as possible, and is practicable on the side of a hill, in order that when the process of smelting is complete the sulphur may run down the hill in channels prepared for the purpose. The shop of a "calcarone" is circular, and the floor has an inclination of from 10 to 15 degrees. The circular wall of a "calcaroni" is made of rude stone work, cemented together with gypsum; the thickness of the wall at the back is 0 50 meter, and from this it gradually becomes thicker until in front, where it is 1 meter, when the diameter is to be 10 meters. In front the thickest part of the wall an opening is left, measuring 1·20 meters high and 0·25 meter broad. Through this opening the liquid sulphur flows. Upon each side of this opening two walls are built at right angles with the circular wall, in order to strengthen the front of the kiln. These walls are 80 centimeters thick each and are roofed. A door is hinged to these walls, thus forming a small room in front of each kiln in which the keeper thereof resides from the commencement to the termination of the flow of sulphur. The inclined floor of the kiln is made of stone work and is covered with "ginesi," the name given to the refuse of a former process of smelting. The stone work is 20 centimeters thick, and the "ginesi" covering 25 centimeters, which gradually become thicker as it approaches its lowest extremity. The front part of the circular wall is 3·50 meters high and the back 1·80 meters. The interior of the wall is plastered with gypsum in order to render it impermeable. The cost of a "calcarone" of about 500 tons capacity is 800 lire. The capacity varies from 40 to 5000 tons, or more, depending upon circumstances. If a mine is enabled to smelt the whole year round, the smaller "calcaroni," being more easily managed, are preferred; the inverse is the case as to the larger "calcaroni," when this is impracticable. When a "calcarone" is situated within 100 meters of a cereal farm its operation is prohibited by law during the summer, lest the fumes of the sulphur should destroy the crop. When, however, the distance is greater from the farm or farms than 100 meters smelting is permitted: but should any damage ensue to the crops as a result of the fumes, the owners of the "calcarone" are required to liquidate it. Therefore, the mines which are favorably situated smelt the entire year, and employ a "calcarone" of from 40 to 500 tons, as there is less risk of process failing, which occasionally happens, and for the reason that the ore can be smelted as soon as it is extracted, whereas, when kilns or "calcaroni" are situated within or adjacent to the limit referred to, they can only be operated five or six months in the year, consequent upon which the ore is necessarily stacked up all through the summer or until such time as smelting may be commenced without endangering the crops, when it becomes necessary to use "calcaroni" whose capacity amounts to several thousand tons. As intimated these large "calcaroni" are not so manageable as those of smaller dimensions, and as a result many thousands of tons of sulphur are lost in the process of smelting, besides perhaps the loss of an entire year of labor. Again the ore deteriorates or depreciates when long exposed to the air and rain, all of which, when practicable, render the kilns or "calcaroni" of the smaller capacity more advantageous and lucrative to those operating sulphur mines in Sicily. Smelting with a "calcarone" of 200 tons capacity consumes thirty days. One of 800 tons, 60 days, and with a "calcarone" of 2000 tons capacity from 90 to 120 days are consumed.

In loading or filling the "calcaroni" the larger blocks of ore are placed at the bottom as well as against the mouth, in order to keep the lower part of the kiln as cool as possible, with a view of preventing the liquid sulphur from becoming ignited as it passes down to where it makes its exit, etc. The blocks of ore thus first placed in position are for obvious reasons the most sterile. After the foundation is thoroughly laid the building of the "pile" is proceeded with; the larger blocks being placed in the center to form as it were the backbone of the pile, the smaller blocks of ore are arranged on the outside of these and in the interstices. The shape or form of the pile when completed is similar to a truncated cone, and when burning the kiln looks like a small volcano. When the kiln has been filled with ore the whole is covered with ginesi with a view of preventing the escape of the fumes. The ore is then ignited by means of bundles of straw, impregnated or saturated with sulphur, being held above the thin portion of the top of the kiln, which is at once closed with ginesi and the "calcarone" is left to itself for about a week. During the burning process the flames gradually descend and the sulphur contained in the ore is melted by the heat from above. In about seven or eight days sulphuric fumes and sublimed sulphur commence to escape, when it becomes necessary to add a new coat of ginesi to the covering and thus prevent the destruction of vegetation by the sulphur fumes. The mouth of the kiln, which has been left open in order to create a draft, is closed up about this time with gypsum plaster. When the sulphur is all liquefied it finds its way to the most depressed part of the kiln, and there, upon encountering the large sterile blocks, quite cold, already referred to, solidifies. It is again liquefied by means of burning straw, whereupon an iron trough is inserted into a mouth made in the kiln for the purpose, and the reliquefied sulphur runs into it, from which it is immediately collected into wooden molds, called "gadite," and which have been kept cold by being submerged in water. Upon its becoming thoroughly cool the sulphur is taken out of the molds referred to, and is now in solid blocks, each weighing about 100 pounds. Two of these blocks constitute a load for a mule, and cost from 4 to 5 francs.

The above is the result when the operation succeeds; but this is not always the case. At times the sulphur becomes solidified before it reaches the mouth of the kiln, because of the heat not being sufficient to keep it liquid in its passage thereto, and other misfortunes not within control, and consequent upon the use of the larger kilns or 'calcaroni."

When the sulphur ceases to run from the kiln the process is complete. The residue is left to cool, which consumes from one to two months. This cooling process could be accomplished in much less time by permitting the air to enter the kiln, but this would be destructive to vegetation, and even to life, consequent upon the fumes of the sulphur. The greatest heat at a given time in a kiln is calculated to be above 650 degs. centigrade; that is, at the close of the process. This enormous heat is generally allowed to waste, whereas it is understood it could be utilized in many ways. A gentleman by the name of Gill is understood to have invented a recuperative kiln, which will, if generally adopted, utilize the heat of former processes named. A ton of ore containing about 25 per cent of sulphur yields 300 pounds of sulphur. This is considered a good yield. When it yields 200 pounds it is considered medium, and poor when only 75 pounds. Laborers are paid ·40 lire per ton for loading and unloading kilns, and from thirty to forty hands are employed at a time. The keeper of a kiln receives from 2 to 2·50 lire per day.

Notwithstanding the "calcarone" has many defects, it is the simplest and cheapest mode of smelting, and is preferred here to any other system requiring machinery and skilled labor to operate it.

The following are the principal furnaces in use here: Durand's, Hirzel, Gill and Kayser's system of fusion; Conby Bollman Process, Thomas' steam process of smelting, and Robert Gill's recuperative kilns.

There are several qualities or grades of sulphur, viz.:

1. Sulphur almost chemically pure, of a very bright and yellow color.

Second Best.—Slightly inferior to the first quality; bright and yellow.

Second Good.—Contains 4 to 5 per cent of earthy matter, but is of a bright yellow.

Second Current.—Dirty yellow, containing more earthy matter than that last named.

Third Best.—Brownish yellow; this tint depends on the amount of bitumen which it contains.

Third Good.—Light brown, containing much extraneous matter.

Third Current.—Brown and coarse.

These qualities are decided by color, not by test. The difference of price is from 3 to 10 francs per ton. Manufacturers prefer the Third Best, because of its containing more sulphuric acid and costing less than the sulphur of better quality.

Sulphur is conveyed to the seaboard by rail, in carts, or on mules or donkeys. Conveyance by cart, mule or donkey is only resorted to when the distance is short or from mines to railroad stations. The tariff in the latter case is understood to be 1 lire per ton per mile. The railroad tariff is ·12 per ton per kilometer; but it is contemplated, it is understood, to reduce this to 7 centimes in a short time. The price in lire of 20 cents per metric ton of sulphur is as follows:

Grade.	At Porto Empedocle.	Licata.	Catania.
Second best	86·60	87 00	90.70
Second good	84·42	84 50	90·30
Second current	84·90	83 90	88 40
Third best	79·00	79 90	86 90
Third good	77·80	77·80	83·00
Third current	76·80	76·70	... ..

Sulphur free on board, brokerage, shipment, export duty, and all other expenses included, costs 20 lire per ton in excess of the above prices. Nearly all the sulphur exported from Palermo emanates from the Lercara mines, in the Province of Palermo, the price per ton being as follows: First quality, 91·60 lire; second quality, 88·40. Sulphur is usually conveyed in steamers to foreign countries from Sicilian ports. The average freight per ton to New York is about as follows: From Palermo, 8·70 lire; from Catania, 13·50 lire; from Girgenti, 16 lire. An additional charge of 2·50 lire is made when the sulphur may be destined for other ports in the United States.

In the year 1838 the Neapolitan government granted a monopoly to a French company for the trade in sulphur. By the terms of the agreement the producers were required to sell their sulphur to the company at certain fixed prices, and the latter paid the government the sum of $350,000 annually in consideration of this requirement. This, however, was not a success, and tended to curtail the sulphur industry, and the government, discovering the agreement to be against its interests, annulled it and established a free system of production, charging an export tax per ton only. At that time sulphuric acid was derived exclusively from sulphur. Hence the demand from all countries was great and the prices paid for sulphur were high. It was about this period that the sulphur industry was at its zenith. The monopoly having been abolished, every mine did its utmost to produce as much sulphur as possible, and from the export duty exacted by the government there accrued to it a much larger revenue than that which it received during the period of the monopoly. The progress of science has, however, modified the state of things since then, as sulphur can now be obtained from pyrite or pyrite of iron. This discovery immediately caused the price of sulphur to fall, and the great demand therefor correspondingly ceased. In England, at the present time, it is understood that two thirds of the sulphuric acid used is manufactured from pyrites. The decrease in prices caused many of the mines to suspend operations, and as a result the sulphur remained idle in stock. In 1884 an association was formed at Catania with a view to buying up sulphur thus stored away at the mines and various ports at low prices, and store it away until a favorable opportunity should present itself for the sale thereof. This had the effect of increasing the prices of sulphur in Sicily for some time, and the producers discovering that the methods of the association increased the foreign demand for their produce as well as its prices, exported it directly themselves, thus breaking up the association referred to, as it was no longer a profitable concern.

The railroad system, which in later years has placed the most important parts of Sicily in communication with the seaboard, has been most beneficial to the sulphur industry. A great saving has been made in transporting it to the ports. This was formerly (as stated) accomplished by carts drawn by mules at an enormous expense, as the roads were wretched, and unless some person of distinction contemplated passing over them repairs were unknown.

PALERMO, March 30, 1888.

THE "DAUNTLESS" CORE DRILL.

We illustrate herewith the "Dauntless" Core Drill made by the M. C. Bullock Manufacturing Company of Chicago. It is compact, strong and very efficient in its work, both as regards speed, cost, and, what is equally important, in giving a true record of the ground passed through. What seems to us as one of the most important features of the drill is the claim, apparently well substantiated, that by means of a pressure gauge the fluctuations of the pressure required to feed the drill into the rock can be immediately recognized. This is of great importance, thus avoiding constant lifting of the core barrel to ascertain whether any change has taken place in the strata bored.

Equally by this gauge can be told if the core breaks and jams fast, and so the loss of the core can be prevented, which in many instances is of great value. In prospecting for precious metals this advantage possessed by the "Dauntless" is of especial merit, as on striking gouge or decomposed vein matter, which will not give a reliable core, the special tools to secure a sample for assaying can be substituted and at the same time the exact thickness of the seam or vein can be determined.

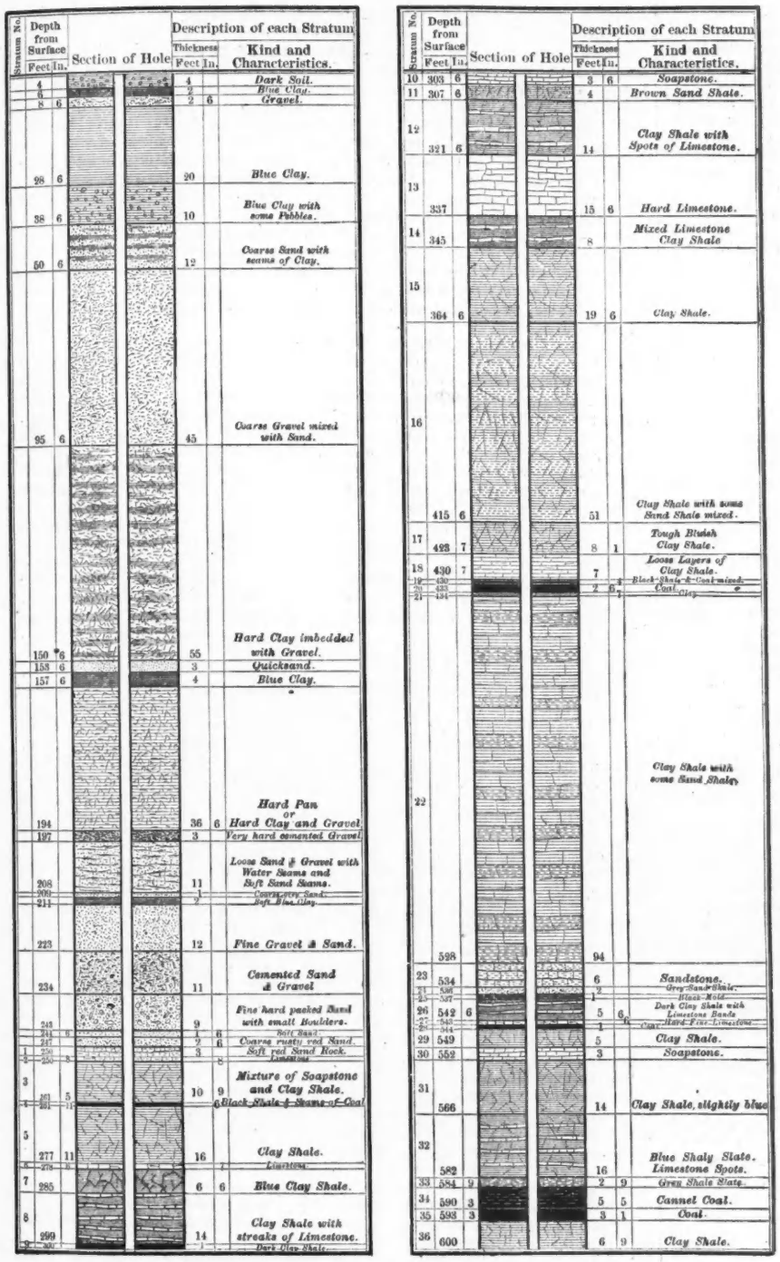
The engines are 5 inches diameter by 5 inches stroke, having reciprocating cross-heads.

The valves secure short ports and, consequently, small clearance, are nearly balanced and cut off at three-fourths stroke. Being actuated by a "drag crank" they are on the outside and easy of access, and the drag crank can be moved, reversing both engines.

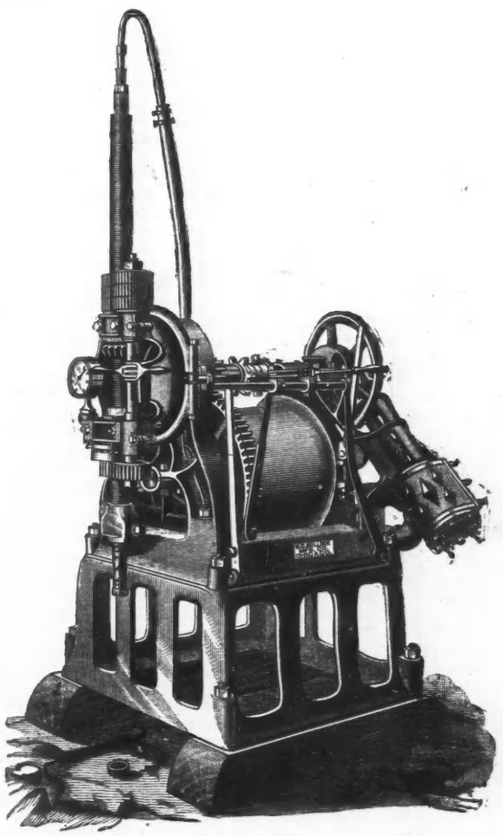
By means of hydraulic plungers, in a cavity communicating with a pressure gauge, the fluctuations of the pressure required to feed the drill into the rock is instantly recognized. This pressure gauge indicates the instant the bit passes from one geological formation to another, enabling the operator to give an accurate record of the exact thickness of each strata at any depth while the drill is running.

By its use he can tell instantly and accurately when the bit passes from one strata of rock to another without depending upon either the drill cuttings or core saved.

By its use he can tell when the core breaks and jams fast in the core lifter or core barrel, and this knowledge enables him to prevent grinding up and destroying not only the core cut but also the record of the hole. By its use he can tell whether to use a fine or a coarse feed, not only to save undue wear on his diamonds, but also to take advantage of and drill faster through the soft measures, or at a slow rate of speed through the hard measures, thus saving the diamonds and expediting the work. This is very important.



Section of Coal Measures at Saybrook, Ill.—Bored by the "Dauntless" Diamond Drill.



The "Dauntless" Diamond Core-Drill.

Krupp's Aluminum Manufacture.—We learn from the American *Register* of Paris that Krupp, of Essen, has taken up the manufacture of aluminum according to the system of Professor Netto, of Dresden, who, in his process, uses cryolite, a mineral found in Greenland. This process is said to yield pure aluminum at a cost of 12 marks a kilo., and can produce an ingot of 2½ kilos. in about an hour's time. It is supposed that Krupp intends to use the metal as an alloy for steel.

SILVER AND GOLD MINING IN CHINA.

We make the following extracts from the report of Consul Smithers, of Tien-Tsin, dated July 14th, 1888:

Many of our readers are personally acquainted with Prof. John A. Church, of New York, the distinguished mining engineer in the ervice of the Chinese Government. This gentleman's employment will certainly prove of great benefit to China and to American manufacturers of mining machinery, by introducing suitable machines under conditions that promise success, for as a skillful engineer of great practical experience, Mr. Church is not going to make any serious misstep in working the mines or treating the ores.

SILVER MINES AT JEHO.

Three hundred miles northwest of Tien-Tsin, and half that distance north of the Great Wall, are the only silver mines known to be worked in all China. The mines are situated in the prefecture of Chêng-tê-tu, a jurisdiction embracing a tract of country as large as the State of Pennsylvania, nominally belonging to the province of Chihli, but really under a separate local government centered in the city of Chêng-tê-tu, better known as Jêho, where a military governor is stationed, who is appointed direct by the Emperor, and holds his office for three years. This country forms the greater part of eastern Mongolia, and extends north of the Great Wall from the longitude of Peking eastward to the sea, and from the Great Wall northward to the Russian frontier of Siberia. It is very mountainous, sparsely populated, badly watered, and has but little soil suitable for cultivation. The trade and tillage are everywhere in the hands of Chinese settlers, the native Mongols not being met with save in the extreme northern part of the country, where they devote themselves entirely to raising cattle.

There are two well-known silver mines 50 miles north of the city of Jêho, one called Yen Tungshan (Chimney Mountain), the other Ku-shanty (Orphan Mountain), 10 miles apart. These mines have been worked by the natives for thirty years with more or less success, and during that time have probably yielded silver to the value of about $2,000.000, the mining and smelting being done entirely by Chinese methods. The ore is argentiferous lead or galena, and is found in thin pay streaks, scattered through veins which occur between porphyry and limestone. Both mines are in high hills, which have been burrowed with native workings and stripped of all ore found above water-level near the base of the hills. During the past ten years the mines have produced very little ore; the native miners reached the water-level, and so came to the end of their resources, as they had no means to remove the water. Athough these miners work in a very primitive way, with rude tools and no blasting-powder, pumps or machinery of any kind, the results they have accomplished are remarkable. Long, tortuous galleries, large enough to admit a man on hands and knees, have been cut through the hardest rock in every direction, the ore and waste-rock being laboriously carried to the surface in bags. The treatment of the ore thus extracted is also remarkable, for these uninstructed Chinese have, by long experience, discovered for themselves the rudiments of the science of smelting and refining silver ores, and are able to produce pure silver with the simplest possible appliances.

Of late years the proprietorship of these mines, worked under a license from the government, for which a royalty of 33 per cent of gross yield has been paid, has passed from hand to hand with a steady loss to the investors. The last proprietors, a native joint-stock company, abandoned the place in despair after losing all their capital, about $250,000.

At this time the condition of the mines was brought to the attention of the grand secretary, Li Hungchang, viceroy of this province, and he determined to have them carefully examined and reported on by a foreign mining expert. The viceroy had engaged the services of Mr. John A. Church, of New York, a mining expert of reputation in the United States, and it was arranged for Mr. Church to examine the mines. He spent several months of last year at this work, and reported to the viceroy that the prospects justified an outlay of money for pumping and hoisting machinery and for labor to open up the mines fully for a more extended survey. The viceroy agreed to this, and furnished the funds for the machinery, which was bought in San Francisco, of the Union Iron Works. Work has now been going on at the mines under Mr. Church's supervision for six months. Shafts have been sunk at both mines, and the water pumped out of one. Native miners have been taught the use of foreign tools and explosives, so that the results of one day's work by the new method are greater than those of one month by the old. Mr. Church has a staff of four Americans (an assayer, an engineer, and two miners), and has been able to keep work going on at both mines with a force of 200 native workmen. He has now opened up the mines sufficiently to form a definite opinion, which is a favorable one, and the work promises to be permanent and successful. More machinery, making a total of about $50,000, has been ordered from the United States, and the success of these mines is likely to open up a much larger field for similar enterprises.

GOLD MINES ON THE AMOOR RIVER.

Subsequent to the opening of the above silver mines by American engineers and machinery the gold-fields on the Chinese or south side of the Amoor River were brought prominently forward. The placer workings on the Mo River, a small tributary of the Amoor, have long been famous, though in a rather vague way, as a rich gold-field. The immense distance of this field from the nearest Chinese towns in that desolate part of northern Manchuria has hitherto discouraged all thoughts of working them systematically. But last year the Chinese governor of the Amoor River district gave serious attention to the question and sent an official to examine the fields. The official returned after six months of travel and investigation, and though he reported immense difficulties to be overcome in reaching and living in those remote fields, yet the gold was so plentiful that it would repay all efforts.

The governor, therefore, approved of the report and memorialized the Emperor favorably. A decree from the Emperor authorized the mines to be opened, and the official in question, Li Chin-yung, was appointed director of the company to be formed. Mr. Li lately visited Tien-Tsin and Shanghai and endeavored to obtain a loan from the foreign banks and syndicates, but they all declined looking upon the project to invest money in that remote and uninhabited region as but little less than an investment in the moon. Nothing remained but for the Chinese Government to furnish the money, and this has been done by the viceroy, Li providing 100,000 taels and the governor of Amoor 30,000, making 130,000 taels capital given to Mr. Li, who has gone to Shanghai to find men and machinery to take to the Amoor River.

This shows the earnest desire of the government and high officials to develop the mineral resources of this country. Such efforts can not but do for China what mining activity has accomplished in other countries, and especially in the United States, namely, strengthen the government, enrich the people, and open up new districts and highways for the general good.

THE MOUND-BUILDERS' METHODS.

"While exploring mounds in Ohio this season, under the direction of the National Bureau of Ethnology," says Mr. Gerard Fowke, in a paper prepared for *Science*, "I used great care in the examination of one mound in Pike County, in order to ascertain, if possible, the exact method of its construction. The mound was built upon the site of a house which had probably been occupied by those whose skeletons were found. The roof had been supported by side posts, and at intervals by additional inner posts. The outer posts were arranged in pairs a few inches apart, then an interval of about three feet, then two more, and so on. They were all about eight inches in diameter, and extended from two and a half to three feet into the ground, except one a few feet from the center, which went down fully five feet. All the holes were filled with the loose dark dirt which results from decay of wood; a few contained fragments of charcoal, burned bones, or stone, but no ashes; nor was the surrounding earth at all burned.

"Around the outside a trench from 3 to 4 feet wide and from 18 to 20 inches deep had been dug, to carry away the water which fell from the roof. Near the middle of this house, which measured about 40 feet from side to side, a large fire had been kept burning for several hours, the ashes being removed from time to time. The ash-bed was elliptical in form, measuring about 13 feet from east to west, and 5 from north to south. Under the center of it was a hole, 10 inches across and a foot deep, filled with clean white ashes, in which was a little charcoal packed very hard. At the western end, on the south side (or furthest from the center of the house), was a mass of burned animal bones, ashes and charcoal. This was continuous with the ash-bed, though apparently not a part of it. The bones were in small pieces, and were no doubt the remains of a funeral feast or offering.

"After the fire died down, rude tools were used to dig a grave at the middle of the house. It measured 10 feet in length from east to west, by a little more than six in breadth. The sides were straight, slanting inward, with rounded corners. The bottom was nearly level, 14 inches deep, but slightly lower at the center. Over the bottom ashes had been thinly sprinkled, and on these a single thickness of bark had been laid. The sides had been lined with wood or bark from two to four inches thick. When this was done, two bodies were placed side by side in the grave, both extended at full length on the back, with heads directly west. One, judging from the bones and the condition of the teeth, was a woman of considerable age. She was placed in the middle of the grave. Her right arm lay along the side, the left hand being under the pelvic bones of the other skeleton. This was apparently of a man not much, if any, past maturity. The right arm lay across the stomach, the left across the hips. This skeleton was five feet ten inches in length, the other five feet four inches.

"The space between the first skeleton and the south side of the grave was covered with the ashes that had been removed from the fire. Beginning at the feet in a thin layer—a mere streak—they gradually increased in thickness towards the head, where they were fully six inches thick. The head was imbedded in them. They extended to the end of the grave, reaching across its entire width, and coming almost, but not quite, in contact with the other head. A considerable amount of the burned bones lay in the southwestern corner of the grave, and the ashes along this part curved up over the side until they merged into what remained of the ash-bed. This had extended to the west slightly beyond the end of the grave.

"As the earth removed from the grave had been thrown out on every side, the bodies were in a hole that was nearly two feet deep. The next step was to cover them. There was no sign of bark, cloth, or any other protecting material above them. They were covered with a black sandy earth, which must have been brought from the creek not far distant. This was piled over them while wet, or at least damp enough to pack firmly; as it required the pick to loosen it, and, besides, was steeper on the sides than dry dirt would have been. It reached just beyond the grave on every side, and was about five and a half feet high, or as high as it could be conveniently piled.

"So far all was plain enough; but now another question presented itself that puzzled me not a little, and that was, what became of the house? That there had been one, the arrangement of the numerous post-holes plainly showed, but the large earth-mound above the tumulus or grave was perfectly solid above the original surface, giving not the slightest evidence that the posts or any part of the house had ever reached up into it. I incline to the opinion that the great fire near the middle of the house had been made from the timbers composing it; that the upper timbers had been torn down, and the posts cut off at the surface, the whole being a kind of votive offering to the dead. At any rate, it is plain that a house stood there until the time the mound was built; it was not there afterwards.

"For the purpose of covering the grave, sand was brought from a ridge a short distance away. There was no stratification, either horizontal or curving. Earth had been piled up first around the black mass forming the grave-mound, and then different parties had deposited their loads at convenient places, until the mound assumed its final conical arrangement. The lenticular masses through almost the whole mound showed that the earth had been carried in skins or small baskets. The completed mound was thirteen feet high and about one hundred feet in diameter.

"Two and a half feet above the original surface was an extended skeleton, head west. It lay just east of the black earth over the grave.

Sixteen feet south of the grave, on the original surface and within the outer row of post-holes, were two skeletons extended, heads nearly west. It would seem that the flesh was removed before burial, as the bones were covered with a dull-red substance, which showed a waxy texture when worked with a knife-blade.

"No relics of any description were found with any of the skeletons; but a fine copper bracelet was picked up in a position that showed it was dropped accidentally."

THE LOSSES IN ROASTING GOLD ORES AND THE VOLATILITY OF GOLD.*

My attention was first definitely called to this subject in 1880 by Mr. Chas. H. Crosby, then in charge of the Pioneer Reduction Works at Nevada City, Cal. He stated that he had found particularly great difficulty in treating the sulphurets from the Murchie mine. This mine was at that time producing considerable quantities of concentrated sulphurets that often assayed as high as $150 per ton. About three-fourths of this value was in gold, the rest in silver. In order to extract the silver content it was necessary to roast with salt. Without salt Mr. Crosby said he could roast the ore with very little loss of either metal, but the moment salt was added losses began to show themselves very rapidly. Thus, according to his tests, with 3 per cent salt, the gold loss was 30 per cent and the silver 50 per cent of the assay value. He attributed these losses to tellurides which he supposed to be present. Through his kindness I secured a quantity of this ore, and with it I have made a large number of tests, with the assistance of several of my students, at the mining laboratories of the university of California. Some of the more important results of this work I shall present in this paper.

I have also had occasion to examine into the literature of the subject, and, curiously enough, in spite of its great practical importance, there seems to be very little definite information in print concerning it. Many of our standard authorities are either silent on the question or contain erroneous statements. The best information is in a shape hardly accessible to those who need it, and consequently I have thought it advisable to include a brief abstract of what I have been able to glean, in a shape for convenient reference.

THE EFFECT OF HEAT ALONE ON METALLIC GOLD.

Gmelin and Kraut, in their "Handbuch der Chemie," Bd. III., p. 1065, edition of 1875, say: "In the highest furnace heat, in the burning mirror, and in the oxyhydrogen flame, gold is only volatile to a small extent. A silver plate held over gold which is strongly heated in the focus of a burning mirror is slowly gilded (Homberg). In melting platinum which contains gold, the latter is volatilized and may be collected by condensing it (Deville and Debray). Compare Fuchs on volatilization of gold in roasting ores containing volatile metals (Fuchs, *Wien Akad.* Ber., October, 1850); by melting by itself or in alloys (Napier). Pure gold placed on the surface of porcelain in a good furnace fire, according to Elsener, volatilizes in part, but not entirely."

I have been unable to find the reference to the work of Fuchs, but an abstract of it is given in the ENGINEERING AND MINING JOURNAL, August 22d, 1885, together with a curious list of many of the older authorities on the subject, by Dr. Henry Wurtz. According to Dr. Wurtz, Fuchs roasted black copper, and found losses due, in his judgment, to the presence of the volatile metals—arsenic and antimony, and not to sulphur, sulphides, or metallic oxides. After roasting the black copper till losses ceased, he treated the ore with sulphuric acid and roasted again. He found losses of gold and silver so long as coal (*charcoal?*) was present in the mass. Homberg, in 1709, claims to have found appreciable quantities of gold in pyrites that showed no traces of it after being roasted. I shall come to this subject later on.

Fehling's "Handwörterbuch der Chemie," Bd. III., p. 476, states that the discharge of electricity of high tension from fine gold points volatilizes gold.

In addition to the above I would add that gold is easily volatile at the point of a good mouth blow pipe flame. It is necessary to take a small fragment of gold, not larger than a pin head. If this is melted on a Plattner cupel with the outer tip of the oxidizing flame the outer margin of the bone ash soon becomes colored purple with volatilized gold.

THE EFFECT OF AN OXIDIZING ROASTING ON GOLD ORES.

Of course, such temperatures as these never occur in roasting gold ores, and it does not follow because gold is volatile at a melting temperature that it is volatile in oxidizing roasting.

Plattner, in his "Metallurgische Röstprozesse" (Freiberg, 1856), goes very minutely into the losses of gold and silver in oxidizing roasting. He shows by a long series of tests made on the small scale in the muffle that a loss of silver in oxidizing roasting is unavoidable. Thus, in some fifty tests, varying from three quarters of an hour to one and a half hours in duration, he records losses of from 0·5 per cent to 18 per cent. He concludes (p. 126) that the percentage loss of silver increases with the temperature of roasting, with the looseness or porosity of the roasting charge, that is, with the facility with which the air can come into contact with the silver, and the freedom of the silver from combination with other substances. The loss also increases with the time of roasting. He also concludes that the silver is volatilized in the condition of oxide, which decomposes at a lower temperature into silver and oxygen.†

With regard to gold contained in metallic sulphides, statements had been made prior to Plattner's time that considerable losses had taken place when these were subjected to an oxidizing roasting, amounting in some cases to 100 per cent (*vide* Homberg, previously cited). He, therefore, made a large number of roasting tests, both direct and synthetic. In these last he used artificial mixtures containing known amounts of gold, either as fine dust or as artificial sulphides and arsenides. He concludes (pp. 127–129) that a loss of gold can take place in an oxidizing roasting only when the operation is carried on so rapidly that fine particles are carried off mechanically by the draft. He also states that the celebrated Winkler had come independently to the same conclusion.

With regard to oxidizing roasting Kûstel, in his "Roasting of Gold and Silver Ores," 1880, says, p. 58: "Generally no loss of gold is suffered during the roasting, neither with iron pyrites nor with arsenical pyrites, although exposed to a considerable heat, and for a long time (from 24 to 48 hours). Many manipulators, however, who have had much experience in roasting gold sulphurets, complain of considerable loss of gold with some kind of sulphurets, which they could not avoid in spite of all experiments with reference to heat and general treatment. It is, therefore, always advisable to investigate the loss of gold with new sulphurets by assay."

On p. 57 Kûstel records the loss of 20 per cent of the gold-content in the oxidizing roasting of certain tellurides of gold and silver, and states that it is not a mechanical loss, but is due to volatilization. That this is so with certain tellurides of gold is undoubtedly true, though I have not yet had sufficient opportunity to thoroughly investigate this branch of the subject.

EXPERIMENTS WITH THE OXIDIZING-ROASTING OF MURCHIE PYRITE.

In order to thoroughly test the conclusions of Plattner, as far as the Nevada City ores were concerned, I have made in my laboratory at various times a number of tests. The sulphurets were carefully examined, and were found to contain chiefly pyrite, with small amounts of chalcopyrite (about 0·5 per cent to 1·5 per cent of metallic copper), a little galena, very small amounts of quartz, and traces of quicksilver from the batteries. Analysis showed, besides, reactions for arsenic and antimony in traces, but although carefully tested for, no reaction for tellurium could be obtained. I understand, however, that in some samples of the ore from this mine traces of selenium and tellurium have been reported.

In 1881 Mr. Douglas Lindley, one of my students, made in duplicate two careful oxidizing roasts with this ore. The charges were two assay tons each. They were roasted in the muffle at a low red heat for an hour, and the temperature was raised to a full red heat for half an hour more. In 1882 I roasted two charges of one assay ton (29·166 grammes) each of this same ore. They were roasted for one hour at a very dull-red heat, with the covers on the roasting-dishes; then for another hour at the same temperature with the covers off, and were finally finished at a cherry-red for half an hour. Total time, 2½ hours. In 1886, Mr. Franklin Booth, my assistant, made another roast with this ore. Charges were one assay ton each. Temperature was at first incipient red for half an hour, then dull-red for eight hours, the total time being 8½ hours.

In each of these cases the lot of ore was very carefully sampled, and the raw ore assayed by scorification; the whole of the roasted ore was then assayed by the crucible assay. The results were as follows:

TABLE I.—OXIDIZING MUFFLE-ROASTS.

	Raw ore		Roasted ore.		Percentage loss.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
	Oz. per ton.		Oz. per ton.		Per ton.	
1881, Lindley, 1½ hours	4·58	27·50	4·58	26·44	0·00	3·85
1882, Christy, 2½ hours	4·58	27·65	4·58	27·07	0·00	2·09
1886, Booth, 8½ hours	4·50	28·39	4·50	27·39	0·00	3·52

In order to obtain the above results, however, the most minute precautions had to be taken to avoid all causes of mechanical loss. Roasting-covers were used till all danger of decrepitation was over, and stirring was avoided, as well as all excess of draft. The samples were exposed in a thin layer, and the roasting was in all cases very complete. The balance used was sensitive to less than 0·01 mg. Hence in the 1 assay ton lots any loss of gold above 20 cents to the ton would have been shown by the balance, and with the 2 assay ton lots above 10 cents per ton would have been shown. This seems to explain Homberg's statement and that of others that gold could not be found in pyrite after oxidizing roasting, although traces could be found before roasting. The only explanation seems to be that such roastings were so conducted as to cause a mechanical loss by dusting.

Hence we may fairly conclude that Plattner's statements concerning the non-volatility of gold during the conditions that maintain in the oxidizing roasting of auriferous pyrite are entirely correct. And it may be fairly assumed that where a loss of gold is reported in such cases that it is due to a mechanical loss due to excess of draft or to insufficient or improperly arranged dust-chambers.

THE RELATIONS OF GOLD TO CHLORINE.

The Plattner chlorination process has made familiar to almost every one the fact that when gold is exposed to the action of chlorine gas in the cold, it is attacked and the soluble chloride of gold, $AuCl_3$, is formed. According to most authorities there exist two other chlorides of gold; the subchloride AuCl, formed when $AuCl_3$ is heated to 130° to 200° C., and a double chloride $AuCl.AuCl_3$ formed by warming AuCl or gold sponge in $AuCl_3$. Pratt states that when $AuCl_3$ is heated in chlorine a higher chloride than $AuCl_3$ forms.

In Gmelin-Kraut I find the statement (l. c. p. 1016) "molten gold is not attacked by chlorine." There is no alleged basis for this statement, but a simple reference to the Miller chlorination process for refining gold, where no further explanation is given. This statement is, as I shall show later, entirely wrong. It seems strange to find so misleading a statement in such an authority.

Professor Percy ("Silver and Gold," Part I. p. 402) gives an account of experiments made in 1838 by Messrs. Lewis Thompson and Arthur Aiken for "a method of assaying and purifying gold." Mr. Thompson received a prize of 20 guineas for his method from the Society of Arts. Mr. Thompson says of his method that it is "founded upon a circumstance long known to chemists, viz.: that not only has gold no affinity for chlorine at a red heat, but that it actually parts with it at that temperature, although previously combined; that is to say, the chloride of gold is reduced to the metallic state by heat alone (and), it cannot, therefore, possess any affinity for chlorine when red hot; this, however, is not the case with those metals with which gold is usually alloyed; it offers, therefore, at once an easy and certain means of separation."

A further account shows, however, that they did not confine themselves to passing chlorine over gold at a red heat, but also used a melting

* A paper by Samuel B. Christy, Professor of Mining and Metallurgy, University of California, Berkeley, Cal., in the Transactions of the American Institute of Mining Engineers.

† Professor Percy, "Silver and Gold," Vol. I., p. 18, throws some doubt on this last conclusion, and further experiments are perhaps necessary to settle the matter. As to the amount of the loss there is no doubt.

heat; in one case the tube is spoken of as white hot. These experimenters state that, taking care to observe certain precautions that they mention, the gold was refined without any loss being perceptible on a scale that indicated to within 0·01 to 0·005 grains (0·6 to 0·3 milligrammes), I also note the mention of "a little chalk or common salt" with the gold, although no reason for its presence is given except that Mr. Aiken states that "the presence of the alkaline chlorides seems to have the effect of preventing the volatilization of the chloride of silver" formed in refining.

I come next to a statement in direct opposition to that of the previous writers:

In the *Chemical News* of March 12th, 1869, appears a note (anonymous) on "The Volatility of Gold at a Cherry-Red Heat in a Current of Chlorine Gas." The writer recommends this process for the assay of gold quartz. He says, "If the pulverized quartz is placed in an earthenware tube of fireclay, and the same is heated in a furnace till the interior of the tube is a bright cherry-red, then if under these circumstances a current of chlorine gas be passed through the retort, the gold combined in the rock will combine at the high temperature with the chlorine, and become volatile therewith, whereas at the place where the heat of the tube or retort is less high the chloride of gold will be again decomposed and gold deposited."

Finally in the *Comptes Rendus* of November, 1869, Debray makes a contribution to the subject by stating that while gold chloride is disassociated at 200° C. by heat alone, that it is volatile at 300° C. in an atmosphere of chlorine. He also states that Boyle was the first writer who had stated that gold chloride was volatile to some extent without dissociation.

The above would appear to be the present conflicting and unsatisfactory state of knowledge on this subject. Let us next see what has been published on the losses of gold in chloridizing roasting.

THE LOSSES OF GOLD IN CHLORIDIZING ROASTING.

Plattner does not seem to have been aware of the volatility of gold in chloridizing roasting; for nowhere in his "Metallurgische Röstprozesse" does he make any reference to the fact, probably because in his time gold ores were subjected to an oxidizing roasting only, in preparing them for the Plattner chlorination process. In speaking of the effect of a chloridizing roasting on the different metals he says on p. 271, after speaking of the volatilization of silver chloride when it comes in contact with other easily volatilized chlorides, "so that in chloridizing roasting, under certain circumstances a not inconsiderable loss of silver may take place."

"Gold (in the native state, as well as when combined with other metals) is only when in a fine state of subdivision and in a slightly warmed state converted into the chloride, $AuCl_3$, which as already stated, gives up two atoms of Cl while still below a red heat and changes into AuCl, and this is by further heating transformed into metallic gold," he then goes on to state the necessity of passing chlorine gas through the previously roasted ore in order to chloridize the gold. But though he treats at length of the volatile products of chloridizing roasting, he fails to make any mention of the losses of gold in this connection.

The only mention of the subject I have been able to find in Küstel is on page 57, where, in speaking of the tellurides of gold, he says: "If salt is present during the roasting, the chloride of tellurium volatilizes voluminously, and it is possible that under this condition the tellurium causes the gold to volatilize likewise. The author, by his own experience—having 4 per cent of salt in the ore on account of the silver—found the loss of gold amounting to 8 per cent before the ore was properly red hot. This was two hours after charging. . . . . Whether the above loss would have occurred in such proportion if no salt had been added, cannot be stated."

Apparently, the first writer who published anything definite on the losses of gold in roasting with salt was Mr. C. H. Aaron. In his "Leaching Gold and Silver Ores" (1881), he says, page 121, that he was first painfully made aware of the fact of his loss by having to make good a deficiency of some $3000 below the yield he had guaranteed. The ore was simple pyrite with no visible peculiarity. It was roasted in a three-hearth reverberatory, with 1 to 2 per cent of salt added on account of the silver. He states that he was first led to suspect the cause of the loss from the examination of a yellow sublimate that formed on the masonry of the furnace over the working doors, when the draft was reduced. This sublimate he "found to be very rich in gold, although there was none to be seen in it by the most careful washing. It also contained iron perchloride, and copper chloride, with lead and other substances."

He then instituted tests on the small scale with two similar samples, one with 4 per cent of salt, the other without, the "roasting being pushed purposely to an extreme as to heat and time, and when the two tests were assayed under exactly similar conditions, that which was salted was found to contain less than half as much gold as the unsalted one."

He further adds: "I then took some light fluffy sublimate from the flue of a roasting furnace, an assay of which gave me a value of some $600 per ton, chiefly gold. The quantity of this material was, however, very small, and the bulk of the matter in the dust chamber was not richer than average bulk of the ore treated. *a circumstance which indicates that the gold was actually to a great extent volatilized in some not easily condensible form.*" The italics are mine.

Mr. Aaron further adds: "I also found that the ore sustained a loss of weight in roasting, equal to about 18 per cent, consequently the roasted ore ought to have been more than 18 per cent richer than before roasting, which was not the case. If this is not considered sufficient proof that the gold may be volatilized in the roasting of some ores with salt, the deficiency is supplied by the fact that, as soon as I made the necessary change by reserving the salt until the nearly dead roasting of the ore was finished, not only did the roasted ore assay 20 per cent richer than the raw, but the yield overran my guarantee, while the tailings nevertheless contained considerably more gold than before. . . . . I afterwards found that a very small quantity of salt, not more than three pounds to the ton, might be mixed with the crude ore without detriment to the gold, and with decided advantage to the extraction of the silver."

Mr. C. A. Stetefeldt gives (*Trans.*, xiv., 339) the very interesting results of his investigations on the chloridizing roasting of the gold ore from Las Minas, in the State of Vera Cruz, Mexico. The ore he treated consisted mainly of 43 to 67 per cent of magnetite, 3 to 22 per cent of pyrite, and 3·5 to 7 per cent of chalcopyrite, the remaining minerals being quartz and garnet. The ore contained less than one ounce per ton of gold and traces only of silver. He found that the losses in a chloridizing roasting were from 42·8 to 93 per cent of the total gold content. He further states "there is no doubt that the volatization of the gold takes place with that of the copper chlorides. The loss increased with the quantity of these chlorides formed and volatilized." He further states, however, "that the copper chloride is by no means an essential element in producing this loss is shown in the following experiments, made by Mr. C. Butters with a gold ore entirely free from copper." This ore was a hard white quartz intimately mixed with about 7 per cent of calcite and a little pyrite. It contained 5·55 oz. silver and 0·65 oz. of gold per ton. On subjecting this ore to an oxidizing roasting a loss of 2 to 9 per cent of silver took place, but no loss of gold. But when the same ore was subjected for one hour to a chloridizing roasting in the muffle at a cherry red heat with 5 per cent of salt, a loss resulted of 70 to 80 per cent of the silver and 68 to 85 per cent of the gold. On increasing the salt to 10 per cent no increase of the losses took place.

I also ought to call attention to the claim of Mr. Stetefeldt that the loss of gold is less in the instantaneous roasting of the Stetefeldt furnace than in the more prolonged treatment in the reverberatory furnace. This claim does not appear to be unreasonable; and the indirect proof that he cites from the work of his furnace at the Lexington mill on an auriferous silver ore tends to bear out that claim (see his paper, l. c., p. 343). This claim, if it could be established beyond doubt, would be of such great importance in the treatment of a large class of auriferous silver ores that must be roasted with salt on account of their silver content, that I hope that he will find it possible to make sufficient direct tests on the large scale with the Stetefeldt furnace to settle the question.

In 1882, while engaged in the study of this subject, I sent Mr. Charles E. Hayes, then one of my students, to investigate what was at that time considered one of the best chlorination-works in California. I secured permission from the proprietors for him to make a thorough study of the work that they were actually doing, and they gave him every opportunity to make the study. They have also kindly allowed me to make public the results, omitting mention of their names.

The furnace used was a double-hearth reverberatory, one hearth being placed above the other. The hearths were 18 feet by 15 feet. The concentrated sulphurets were first dried on the furnace-top for 36 hours. From here a charge of 2500 pounds was dropped on to the upper hearth. Here it was roasted for 12 hours, when a second similar charge was put in. At the end of a second 12 hours the first charge, which had now been in the furnace 24 hours, was dropped on to the lower or finishing hearth, and a new charge put in the furnace to take its place. After remaining on the finishing hearth about 8 hours, till the sulphurous fumes had ceased, 1 per cent of salt was added, and 4 hours later the charge was drawn. This made a total time in the furnace of 36 hours.

Mr. Hayes found it impossible to keep the various charges in the furnace sufficiently distinct to follow any one of them through, so, with the consent of the proprietors, a single charge was put through the furnace by their workmen, under as nearly the usual conditions, as to temperature, etc., as possible. A charge of 2441 lbs. which had been dried as usual on the furnace-top for 36 hours, was weighed out and carefully sampled by Mr. Hayes.

The notes of the tests were as follows:

March 26, 8 A.M. Charge of 2441 lbs. put on upper hearth.

March 26, 3 P.M. (after 7 hours). Charge dropped to the lower hearth, so as to cause as little delay in the use of the upper hearth as possible.

March 27, 11 A.M. (20 hours later). 22 lbs. of salt were added.

March 27, 5 30 P.M. (6 hours, 30 minutes). Charge was drawn. Total time, 33 hours, 30 minutes.

The roasted ore weighed only 1873 pounds, having lost 23·27 per cent of its weight in the roasting. The roasted ore was carefully sampled by Mr. Hayes and the samples were assayed as follows:

TABLE II.

	Gold.	Silver.
Raw ore (average of 5 scorification-assays).....	4·536 oz.	19·884 oz. per ton.
Roasted ore (average of 4 crucible-assays)..... ..	2·980 "	18·583 " " "
Hence $\frac{2441}{2000}$ tons raw ore contained.....	5·536 "	24·268 " Troy net.
And $\frac{1873}{2000}$ tons roasted ore contained.....	2·791 "	17·403 " " "
Hence the actual net loss in roasting was..... .	2·745 "	6 865 " "
Or in per cent of original ore-content.....49·580 % gold.		28·280 % silver.

This enormous loss was entirely unexpected by the proprietors, who had thought it unnecessary to carry on any systematic sampling and assaying. It is but fair to add, however, that the mode of roasting in this test was not quite the same as the usual one, as the charge was on the lower hearth 26½ hours instead of 12 hours, and the salt was mixed with the ore 6½ hours instead of 4 hours, the usual time. Still, the test shows in the most unmistakable manner what enormous losses may take place in roasting such ores with salt, unless the most minute details of the treatment are carefully looked to. At these works the upper hearth was usually kept at a red heat a good part of the time, and the temperature of roasting was undoubtedly kept generally too high.

Mr. Hayes also sampled and assayed the tailings after they had been leached for gold and silver in the usual way with the following result:

	Gold.	Silver.
Average of 3 crucible assays of tailings in ounces per ton.....	1·487	14·233

He, however, neglected to determine the weight of the tailings after leaching. If, however, we allow a loss of 10 per cent in weight due to soluble salts, which is certainly fair to the process, we shall have as the net content of the tailings in ounces per ton:

	Gold.	Silver.
$\frac{1687}{2000}$ tons tailings contain net...	1·254	12·005

Or in percentage of original content there were lost in the tailings 22·65 per cent. of the gold and 49·47 per cent. of the silver.

Hence the final result of the test were:

TABLE III.

	Gold.		Silver.	
	Ounces.	Per cent.	Ounces.	Per cent.
Loss by volatilization and dusting	2·745 or	49·58	6·865 or	28·28
Loss in tailings	1·254 "	22·65	12·005 "	49·47
Actual yield by mode of treatment	1·537 "	27·77	5·398 "	22·25
Original content raw sulphurets	5·536 or	100	24·268 or	100

A curious fact is that in spite of the long chloridizing roasting, perhaps in consequence of it,* less than 23 per cent of the silver was extracted by the hyposulphite solution, and nearly 50 per cent was left in the tailings. The excessive losses were in part due, no doubt, to the fact that this furnace had only recently been erected at the time of this test, and the workmen had hardly got used to it. For in 1880, Mr. H. W. Carroll, another of my students, obtained the following results from sampling the ore from this same mine and the final tailings. The ore had been roasted in an old-fashioned, long, two-step reverberatory furnace :

	Gold—Ounces per ton.	Silver—Ounces per ton.
Raw sulphurets	3·27	10·80
Final tailings	0·11	8·56

In order to determine the relative importance of the various factors, amount of salt, temperature, and time of roasting, a large number of experiments with muffle roasts were undertaken at the laboratory of the Mining Department of the University, both by myself and by my students under my direction.* These roasts were mainly with the Murchie pyrite already described. Nearly 200 separate experiments have thus been made, from which I select a few of the most reliable and characteristic for illustration.

(TO BE CONTINUED.)

IRRIGATION STATISTICS ABROAD.

The reports of the Commissioners on Irrigation in California furnish the following data of what has been done in foreign countries in this respect:

India.—The works in course of construction and projected are estimated to cost $175,000,000, and the rate of expenditure is now many millions annually. The work can be done cheaper in that country than in almost any other, as the wages of a skilled laborer are only 50 cents per day, and of an ordinary laborer 12 cents per day. Earth excavations can be made for 5 cents per cubic yard, and masonry from $1.50 to $3 per cubic yard. In India four systems are in operation: Canals, tanks or reservoirs, the inundating system, and wells. The Ganges Canal is 10 feet deep, 170 feet wide at its upper part, 900 miles long, and is intended to irrigate 1,500,000 acres. It can carry 7000 cubic feet of water per second. It cost about $12,000,000, and would probably have cost many times as much in this country. This canal is navigable, and was built and is owned by the government. There are several others which rival it in magnitude and importance.

The tank system prevails in Madras, where, it is said, there are 53,000 tanks, with 30,000 miles of embankment, and 300,000 separate masonry sluices and weirs. They are generally shallow—from 6 to 10 feet deep. The government owns these tanks, and the revenue from them is $7,750,000.

Italy.—The first canal of which there is an authentic record was built in the twelfth century. The large Muzza Canal was built in 1520. The rainfall in Italy is about 37 inches, or 38 inches annually in Lombardy, and about 22 inches in Piedmont, but notwithstanding this fact a very large area is irrigated in these provinces.

Italy uses about 24,000 cubic feet of water per second, and 1,600,000 acres of land are irrigated. In the 700 years in which irrigation has been practiced in Lombardy, it is estimated that $200,000,000 have been expended, with the result that the whole country is a garden.

Spain.—With its high temperature and scanty rainfall, Spain needs irrigation more, and repays it better than almost any other country. Irrigated land is often worth from $700 to $900 per acre, while the same land without such improvement is only worth $80. The Spaniards received their ideas of irrigation from the Moors, and many of the older systems are the work of that people. The area of land irrigated in Spain is, according to official reports, 4,439 square miles. The principal canals, however, only irrigate 500,000 acres, the multitude of smaller canals and reservoirs furnishing water for the remainder.

In France irrigation is more of a local than national enterprise. The rainfall is from 18 to 32 inches annually, so it is not a necessity. In England there are now extensive water meadows, and irrigation on the Italian plan has recently been attempted.

Tempered Brass.—F. M. Stowe, of Winneconne, it is said, has solved the problem of tempering brass. He has shown an edged tool that will cut a seasoned pine or hemlock knot without affecting the tool, and the various tests he has made proved it superior to steel for cutting purposes, as it takes altogether a finer edge.

Abolishment of the Office for Weighing Coal.—The New York Corporation Council pronounces the law void which was passed by the last Legislature creating an office for the weighing of coal, being in violation of article 5, section 8, of the Constitution, which says: "All offices for the weighing * * * any commodity whatever are hereby abolished and no such offices shall hereafter be created by law."

Electric Motors for Saw-Mills.—An electric motor is in successful operation for wood-sawing in Lewiston, Me. It is a six horse-power, and with a 26 inch saw, which was driven at a velocity of 1450 revolutions per minute, a cord of slabs was sawed in twenty minutes. The proprietor claims that with a six horse-power electric motor he can do more work than with a ten horse-power steam engine.

* As claimed in Mr. Stetefeldt's paper, l. c., p. 344.

Aluminum Bronze in Germany.—According to Kuhlow's German Trade Review, at the end of last month the large dynamo plant of the Lauffen-Neuhausen Company was put in operation. The daily output is now 300 kgs. of aluminum or 3000 kgs. of 10 per cent aluminum bronze daily.

The Need of Restricting Immigration.—The Contract Labor Committee authorized by Congress will resume its investigations about November 1st. The committee thinks that something positive must be done. The laws relating to contract labor have been violated to an alarming extent. Italy is flooded with steamship agents who make false statements to induce emigration. One of the facts brought to light incidentally was that naturalization papers are being issued fraudently to an alarming extent. It is very easy to get out these papers under our law; any one having access to the seal of a court can get them out and sell them. Another fact developed was that the New England fishermen are aliens to the extent of 75 per cent.

New Electrolytic Treatment of Copper Solutions.—It is reported that the mining engineer, who is at the head of the Official Department of Mining in Spain, and who successfully organized the Mining Exhibition at Madrid in 1883, has invented a new process connected with that employed at Rio Tinto and similar mines, to obtain ore from weak solutions of sulphate of copper. The object of the process is to obtain the copper in the pure state as electrolytic copper, instead of in the form of precipitates. Laboratory experiments have been made with solutions brought from the Rio Tinto and the Lagunazo mines. These proved successful, the process being exceedingly simple. It is stated of the copper contained in the solution 78 per cent. is obtained as pure electrolytic copper, and the remainder only has to be refined. The Lagunazo mines are said to be about to employ the process on a large scale.

The Spheroid-Bearing Granite of Mullaghderg, of County Donegal, Ireland.—A paper was recently read before the Geological Society by Doctor Frederick H Hatch, on a remarkable variety of granite which may be compared with the well known orbicular diorite or Napoleonite of Corsica. According to Mr. J. R. Kilroe, of the Geological Survey of Ireland, who first discovered this interesting rock, the concretionary balls occur in close juxtaposition in a mass of granite of 5 or 6 cubic yards in size. They have not been found in any other portion of the granite area. The author gave a detailed description of the microscopic structure of the normal granite. He also described the spheroidal bodies, and gave a synopsis of the literature concerning the occurrence of similar concretionary bodies in granite. The conclusion arrived at was that concretionary bodies occurring in granite may, according to the mode of arrangement of their constituents, be divided into three classes, viz: (1) the concretionary patches of Phillips; (2) the granospherites of Vogelsang; (3) the belonospherites of Vogelsang. The spheroids from Mullaghderg belong to the last mentioned class. They must be regarded as concretions formed, during the consolidation of the granite magma, by a process of zonal and radial crystallization around an earlier formed nucleus.

Precipitation of Barium Sulphate in Liquids Containing Bromine.—*M. M. Lucion in Revue Universelle des Mines, de la Metallurgie, etc.*—Bromine has frequently been indicated for some years for the analysis of compounds of sulphur, that is to say for the transformation of sulphur, of sulphurous anhydride, etc., into sulphuric acid. The latter is afterwards precipitated by chloride of barium, and weighed as sulphate. Everywhere it is recommended to expel by boiling any excess of bromine before proceeding with the precipitation by the barium salt.* Nowhere have I yet found the reason indicated to sustain this manner of operating, and tests show there is no reason for it. Introduce a small quantity of sulphuric acid in a matrass, and fill up the vessel with bromine water. By means of a pipette remove from this solution two samples for experiment of exactly 100 c. c. each. Reduce one of these by evaporation until the elimination of bromine is complete, after which precipitate by means of 25 c. c. of a solution of barium chloride of sufficient concentration that the reagent may be in excess. The other portion is treated with the barium salt directly without elimination of the bromine. Two precipitates obtained by these operations were collected, washed under identical conditions, and then ignited and weighed. The results were, by direct precipitation 8542 gr. barium sulphate; by precipitation after elimination of bromine, 8541 gr. barium sulphate. The presence of bromine is thus seen to be without any influence upon the analysis. The reason for which its elimination is recommended can not be looked for, save in the disagreement resulting from the operation of the disengagement of bromine vapor during the filtration.

Reports of the British Inspectors of Mines for 1887.—From the reports of the British Inspectors of Mines for the year 1887, recently issued, we learn that during last year the aggregate number of persons employed in and about the whole of the mines in the United Kingdom of Great Britain and Ireland amounted to 568,026, of whom 5725 were females above ground. The total number of fatal accidents was 881, and the total number of deaths occasioned thereby 1051; being an increase of 12 in the number of fatal accidents, and an increase of 33 in the number of lives lost, compared with the totals for the preceding year.

The ratio of fatal accidents and deaths to persons employed is shown by the summary. The death rate was slightly higher than during the preceding year, but lower than the average of the preceding 13 years. In the mines classed under the Coal Mines Regulation Act the total number of persons employed was 526,277, of whom 4183 were females working above ground. There were 830 fatal accidents and 995 deaths, the number of accidents being 23 more than in the preceding year, and the number of deaths being 42 more. There was one fatal accident for every 634 persons employed, and one death for every 529 persons employed. These figures compare favorably with the corresponding averages for the 10 years 1874 to 1883, which were 587 and 446 persons respectively. The summary of the quantities and kinds of mineral wrought in the different districts shows that the total quantity was 173,049,795 tons, of which 162,119,812 were coal and 7,569,918 ironstone, the rest being fire-clay, oil shale and other minerals, being a total increase of 3,042,836 tons, compared with

* See Von Miller und Kiliani, "Kurzes Lehrbuch der Anal. Chem.," pp. 311, 324, 340; Fresenius, Anal. Chim. Quant., ed. Forthomme, p. 640.

the preceding year, the increase of coal being 4,601,330, with a decrease of ironstone of 1,292,730 tons. The joint official duties of Mr. Dickinson, the chief inspector, and the inspectors assisting occupied 696 days. In this time 607 mines were visited, 313 of the visits being underground as well as above ground, and 294 visits in connection with work and inquiry above ground, including the investigation of 51 fatal and 132 non-fatal accidents, besides 16 casualties, which on inquiry proved not to be comprised by the acts, and also 12 intimations of danger or irregularity, with attendances at inquests, petty sessions, etc.

Mr. Wynne, inspector for the district comprising North Staffordshire, Cheshire and Shropshire, expresses his satisfaction in finding that the use of gunpowder is being abandoned in that district, and notes that wedges, lime, water and gelatinous cartridges, and other modern substances, are gradually superseding the older explosive. Mr. Bell, of the Durham district, says that the work has been enormously heavy in consequence of the passing of the new Coal Mines Regulation Act, and getting the machinery in motion to carry it out; while Mr. Beattie Scott, of the South Staffordshire and Worcestershire district, reviews the working of the act at length, and gives some interesting statistics in connection with it. The records of the other inspectors are well worthy of the attention of mine and colliery proprietors.

The Walcher Coal-Getting Apparatus.—The object of this apparatus is the same as that of the Levet hydraulic wedge, viz., to supersede the use of powder or other explosives in fiery mines. It is self-contained, and complete in itself, and consists of two principal parts—the expanding mandrel for breaking down the coal, and the hydraulic pump or jack for obtaining the requisite power. These two parts are rigidly fixed together, and by a careful choice of materials the total weight has been kept down to 150 pounds, so that it can be easily handled by two men. All the principal parts are either of hardened and carefully tempered steel, or of phosphor bronze. The pump, which is of very neat and ingenious design, and not liable to injury even in unskilled hands, is fully described and illustrated in the paper and its accompanying engravings. All the working parts are self-contained, as in an ordinary hydraulic jack. The breaking-down part proper is approximately of cylindrical form, circular at the front end, and slightly oval at the rear, where it is coupled to the pump. It consists of two movable cheeks and a central square part lying and sliding between them, the whole being of a suitable size to be easily introduced into a hole 5 inches in diameter and 3 feet 3 inches deep, bored in the upper portion of the coal, which, of course, has been previously undercut by hand or machine. In recesses between the cheeks and the sliding-block are six small toggles of hardened steel, of cylindrical shape with hemispherical ends, arranged three above and three below the sliding block, and lying at an angle of 45 degrees. The sliding-block is coupled to the piston-rod of the pump, and can be drawn back until the toggles assume a nearly vertical position (85 degrees) and force out the upper and lower cheeks. As a pressure of 500 atmospheres, corresponding to 50 tons on the piston, can be easily obtained in the pump, and as the force of the toggles, unlike that of a wedge, increases enormously as they approach the vertical position, an up-and-down force of from 200 and 300 tons can be very easily obtained. The friction is insignificant, being only that of the piston-rod in the stuffing-box, and of the toggles on their bearings. When the apparatus is inserted in the hole ready for applying the pressure, its outer or pump end is slung by a chain from one of the timbers supporting the roof, or from the standard which has been previously used for the drill, so as to save it from being injured by falling when the coal comes down. After the front portion has been wedged off, it may be inserted deeper in the hole, and the operation repeated. Glycerine is by preference used for charging the pump, as it not only protects the working parts from rust, but also acts as a lubricant. The apparatus has been in use since September last at the Sandwell Park Colliery, near Birmingham, and at the Lilleshall Company's pit, Shifnal, and for a still longer period in several of the Westphalian collieries. It is now undergoing a special trial by the commission appointed to award a prize of 1000 ducats (£370) offered by the coal owners in the Ostrau Karwin district for the best substitute for explosives. Besides detailed drawings of the apparatus, the paper is illustrated by sketches of various methods of its application under differing conditions, and of the manner in which the coal is brought down.—*Bulletin de la Société de l'Industrie Minerale*, vol. I., 1887, p. 767; through *Proc. Inst. Civ. Eng.*

BOOKS RECEIVED.

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

The Mining Manual for 1888. By Walter R. Skinner. London, England. Published by the author. Pages 654. Price, 7s. 6d. net. Post free, 8s.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

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

PATENTS GRANTED AUGUST 7TH, 1888.

387,339. Process of Purifying Hyposulphite Solutions Used in Leaching Ores. Roswell D. Clark, Cortez Nev.
387,347. Amalgamator. Adam H. Eysaman, Dayton, Nev.
387,357. Asphaltum Compound, and Process of Making the Same. Moses S. Higbie, South Amboy, N. J., and Albert W. Dougherty, Brooklyn, N. Y.
387,358. Bitumen Compound, and Process of Making the Same. Moses S. Higbie, South Amboy, N. J., and Albert W. Dougherty, Brooklyn, N. Y.
387,368. Asbestus-Faced Felt. James L. Reed, Brooklyn, Assignor of five ninths to De Long & French, New York, N. Y.
387,375. Preserving Wood. George Speiz, Dutch Kills N. Y.
387,446. Machine for Reducing Ores, etc. George Raymond and Albert Raymond, Chicago, Ill., Assignors to the Cyclone Pulverizer Company, New York, N. Y.
387,487. Apparatus for Manufacture of Lamp-Black. Arthur R. Blood, Warren, Bryant H. Blood, Ludlow, and Erastus R. Blood, Ludlow, Administrator of Homer E Blood, deceased, late of Ludlow, Pa.; said Bryant H. Blood Assignor to said Arthur R. Blood.
387,492. Process of Extracting Gold and Silver. Roswell D. Clark, Cortez, Nev.
387,505. Method of Measuring Electricity. George Forbes, London, England.
387,539. Reducing-Machine. George Raymond and Albert Raymond, Chicago, Ill., Assignors to the Cyclone Pulverizer Company, New York, N. Y.
387,554. Process of Treating Iron Ore. Gurdon Conkling, Glens Falls, N. Y.
387,580. Mineral-Cement Gravel Roofing. Archibald G. Cummings, Chicago, Ill.
387,588. Process of Manufacturing Hydraulic Cement. Charles R. Gostling, Whitehall, Pa.
387,598. Reducing-Machine. George Raymond and Albert Raymond, Chicago, Ill., Assignors to the Cyclone Pulverizer Company, N. Y.
387,613. Process of Treating Native Soda. Laurence F. J. Wrinkle, Virginia City, Nev

PATENTS GRANTED AUGUST 14TH, 1888.

387,675. Anchor or Support for Deep-Well Packers or Tubing. Solomon R. Dresser, Bradford, Pa.
387,676. Process of Manufacturing Gas. George Spring Dwight, Hamburg, Germany, Mary Torrey Dwight, Administratrix of said George Spring Dwight, deceased.
387,688. Extraction of Zinc from Ores. Albert H Low, Denver, Colo.
387,876. Process of Preparing Aluminum-Bronze and other Alloys. Paul Héroult, Lauffen-Uhwiesen, Switzerland.
387,952. Apparatus for Introducing Sand or other Powdered or Granulated Substances into Bessemer Converters. James J Frooheiser, Johnstown, Pa., Assignor to the Cambria Iron Company, of Pennsylvania.
387,964. Belt or Endless Apron for Ore-Concentrators. Isaac A. Woodbury, East Cambridge, Mass.

PATENTS GRANTED AUGUST 21ST, 1888.

388,145, 388,146 and 388,147. Metallic Alloy. Heinrich Ostermann and Charles Lacroix, Geneva, Switzerland, Assignors to the Usine Genevoise de Dégrossissage d'Or, same place.
388,152. Non-magnetic Alloy. Alfred H. Robert, Ponts Martel, Switzerland, Assignor to C. Huguenin-Thiébauld & Fils, same place.
388,217. Manufacture of Sodium-Chlorate. Edmund K. Muspratt, Seaforth Hall, and George Eschellmann, Northwich, England.
388,245 and 388,246 Method of Working Metals by Electricity. Nicholas Benardos, St. Petersburg, Russia.
388,275. Blast Furnace. Fred. W. Gordon, Philadelphia, Pa., Assignor to Gordon, Strobel & Laureau (Ltd.), same place.
388,284. Soda-Ash Furnace. John F. Kennedy, Elkton, Md., Assignor of two thirds to Thomas Gowan and Andrew Ennis, both of same place.
388,312. Battery-Zinc. Benjamin Scarles, Clinton, Mass., Assignor of one half to Charles Swinscoe, same place.
388,336. Process of Forming Ingots. James B. D'A. Boulton, Jersey City, N. J., Assignor to the Solid Ingot Company, of New York.
388,375. Apparatus for Reducing and Pulverizing Fuel. Hamilton Ruddick, Brooklyn, N. Y., Assignor to the Pulverized Coal and Furnace Company, of New York.

PATENTS GRANTED AUGUST 28TH, 1888.

388,406. Sulphuric Acid Distributor. Schuyler Frazier, Natrona, Pa.
388,414. Steam Engine Valve. John Heath, Janesville, Wis.
388,415. Device for Gearing Engine-Shafts Directly to the Driven Machine. Edmund H Hewins, Boston, Mass.
388,440. Protecting Device for Rolling-Mills. James Paton, Cleveland, Ohio.
388,442. Underground Electric Conduit. Edward H. Phipps, New Haven, Conn.
388,464. Ore-Separator. James Talley, Denver, Colo., Assignor to Sarah E. Talley, same place.
388,465. Apparatus for the Manufacture of Gaseous Fuel. Andrew Thompson, Pittsburgh, Pa., Assignor of two-thirds to John T. Moore, same place.
388,468. Furnace Fuel-Feeder. Arthur Warne, Buffalo, N. Y.
388,475. Apparatus for the Manufacture of Lamp-Black. Samuel Cabot, Jr., Boston, Mass., Assignor to Godfrey L. Cabot, Worthington, Pa.
388,476. Apparatus to Illustrate Centrifugal Force. John Coffin, Johnstown, Pa.
388,477. Electrical Conductor. William A. Conner, Pittsburg, Pa.
388,512. Electric Motor. Jean T. Van Gestel, New York, N. Y., Assignor to the Van Gestel Manufacturing Company, of New York.
388,522. Rotary Engine. Joseph E. Beauchemin, Sorel, Quebec, Canada.
388,542. Coal-Chute. John H. DuBois, Hoboken, N. J.
388,558. Variable Expansive and Reversing Motion for Oscillating-Cylinder Engines, John W. Hartley, Stoke-on-Trent, England.
388,565. Metal-Rolling Machine. Daniel E. Kempster, Boston, Mass.
388,570. Ingot-Manipulator. Orlando P. Mason, Bellaire, O.
388,583. Electric Meter. Karl Rabb, Kaiserslautern, Bavaria, Germany.
388,602. Portable Metal-Sewing Machine. Charles W Trowbridge, Chicago, Ill.
388,628. Process of Making Battery-Zincs. Robert L. Carr and Parker Borden, Fall River, Mass.
388,645. Apparatus for Hardening and Tempering by Electricity. Philip Diehl, Elizabeth, N. J.
388,654. Steam Exhaust-Pipe Valve. John Erwood, Chicago, Ill., Assignor of two fifths to James G. Beckerleg, same place.
388,656 Wire-Rope or Cable. Henry W. Farley, Urbana, Ill.
388,659. Ore-Concentrator. William A. Frank and Thomas Winks, Pinal, Ariz.
388,673. Nail-Plate Feeder. George T. Harden and Edmund S. Grant, Middleport, Ohio, said Harden Assignor to James S. Boggess, same place.
388,692. Traction-Engine. Edward M. Kpollin, Lacona, N. Y.
388,707. Electric Meter. Henry G. Morris, Philadelphia, Pa., Assignor to the Grove Electric Company, same place.
388,711. Rock-Drilling Machine. John A. Pashley, Radersburg, Mont.
388,753. Electric Motor. John Batley, Philadelphia, Pa.
388,755. Steam-Engine. Jean Bonicard, Langon, Gironde, France.
388,759. Incrustation Preventive. Duncan H. Cameron, Woodville, Ontario, Canada, Assignor of one-half to David Annis, same place.
388,801. Coal-Wagon. John R. Wilson, Greensburg, Pa.

PATENTS GRANTED SEPT. 4TH, 1888.

388,849. Apparatus for Manufacturing Water-Gas. George Spring Dwight, Hamburg, Germany; Mary Torrey Dwight, administratrix of said George Spring Dwight, deceased.
388,860. Regulator for Steam Pumping-Engines. Michael Greenwood, Wilmington, Del., Assignor to the Hall Steam Pump Co., same place.
388,867. Metal Tube. Hiram W. Hayden, Waterbury, Conn., Assignor to Holmes, Booth & Haydens, New York, N. Y.
388,871. Working-Valve for Pumps. Josiah A. Hoffman, Addison, N. Y.
388,873. Steam-Generator. George M. Hopkins, Brooklyn, Assignor to the Economic Motor Company, New York, N. Y.
388,889. Well-Digging Apparatus. William Lowman, Marionville, Pa.
388,903. Gas Scrubber. Wensel Morava, Chicago, Ill.
388,933. Apparatus for Lining Journal Boxes. George W. Topham, Boston, Mass.
388,938. Machine for Reducing Metal Rods. Henry A. Williams, Taunton, Mass., Assignor to the H. A. Williams Manufacturing Company, same place.
388,939. Machine for Cleaning Brick. John H. Williams, Boston, Mass., Assignor of one half to Geo. R. Kelso, same place.
388,943. Pump. John Woodward and Robert Anderson, Oil Springs, Ontario, Canada.
388,953. Gas Retort Bench. André Coze, Reims, France.
388,964. Compressed Air Motor. Otto W. Godkin, Milwaukee, Wis.
388,997. Manufacture of Potassium Chlorate. Edmund K. Muspratt, Seaforth Hall, near Liverpool, and Geo. Eschellmann, Northwich, England.
389,009. Regenerative Gas-Furnace. G. Pietzka, Witkowitz, Moravia, Austria-Hungary.
389,020. Process of Making Neutral Compounds of Chloride of Sulphur. Adolph Sommer, Berkeley, Cal.
389,021. Compound of Tallow and Chloride of Sulphur. A. Sommer, Berkeley, Cal.
389,032. Pressure-Regulator and Cut-Off. George Westinghouse, Jr., Pittsburg, Pa.
389,043. Method of Preparing Brick for Transportation to Market. James C. Anderson, Highland Park, Ill.
389,058. Process of Reclaiming Oil from the Products and Waste of Machine-Shops, Everett L. Cole, Chicago, Ill.
389,065. Pressure Regulator. Conrad Eurich, Pittsburg, Assignor of one half to John Eurich, Allegheny County, Pa.
389,073. Portable Steam-Boiler. Leonard H. Hall, Erie, Pa.
389,082. Pressure-Regulator for Air, Gas, Steam, or Liquids. Walter M. Jackson, New York, N. Y.
389,103. Apparatus for Manufacturing Gas. Henry C. Rew, Chicago, Ill.
389,104 and 105. Apparatus for the Manufacture of Gas. H. C. Rew, Chicago, Ill.
389,106. Process of Making Gas. Henry C. Rew, Chicago, Ill.
389,144. Method of Making Tubes. Louis Gathmann, Chicago, Ill.
389,146. Valve-Gear for Steam-Engines. Noble T Greene, Providence, R. I.
389,161. Process for Reducing Ore. Theodore Michaut, Pierre Connoy, and Frank J. Wiest, Boulder City, Colo.

PERSONAL.

Mr. Charles H. Litchman has resigned the general secretaryship of the Knights of Labor.

Mr. John Hays Hammond, Mining Engineer, of Grass Valley, Cal., has returned from Mexico.

Gen. C. P. Buckingham, President of the Chicago Steel-Works, of Chicago, died in that city on the 30th ult., aged eighty years.

The fifty-second meeting of the American Institute of Mining Engineers will be held at Buffalo, N. Y., beginning on Tuesday, October 2d, 1888.

Our valued contemporary, *Light, Heat, and Power*, of Philadelphia, which has heretofore been a semi-monthly journal, will now be issued weekly.

Mr. John Heard, Jr., Mining Engineer, of Medford, Mass., Manager of the Brunswick Antimony Company, has gone to California on professional business.

Mr. Jacob Souder, a prominent coal operator of Pottsville, Pa., and for many years sales agent of the Philadelphia & Reading Company, was killed between the bumpers of the cars at Crystal Colliery on the 31st ult.

Dr. E. D. Peters, the well-known authority on copper smelting, informs us that his engagement at the Canadian Copper Company, Sudbury, Ont., to which we referred in the ENGINEERING AND MINING JOURNAL of August 18th, is only temporary, that he expects to complete his work there in a few months.

Mr. A. F. Wuensch, who for many years was connected with the Leadville *Herald-Democrat* and recently with the Denver *Republican*, has accepted a position with the Engineering Department of the Union Pacific Railway, and will devote his time to an examination of mining prospects along proposed lines contiguous to that road. He will pass the coming winter in California.

The death is announced of Mr. William H. Baily, acting palæontologist of the Geological Survey of Ireland, aged sixty-nine years. Mr. Baily was connected with the Bristol Musuem until 1844, when he was attached by the late Sir Henry de la Beche to the Geological Survey of England, first as a draughtsman, and afterwards as assistant naturalist under Edward Forbes and subsequently under Prof. Huxley. In 1857 Mr. Baily was transferred to the Irish branch of the Geological Survey as palæontologist, and this post he held until his death.

Mr. F. C. Blake, Superintendent of the Pennsylvania Lead Company, sends us the following obituary notice: "The death is announced of John Nicholas Tilemann, general manager of the Mingo Furnace Company, at Salt Lake City, Utah, on Tuesday evening, September 4th. Mr. Tilemann was born in Denmark; his father, a Lutheran clergyman, and his mother were persons of fine, strong characters, and the ability and sterling value of their son show that much came to him by inheritance, as well as from his thorough education and his experience in life. Mr. Tilemann came to this country not long after he had finished his University education, and was for several years chemist for the Pennsylvania Salt Company at Natrona, Pa.; later he was assistant superintendent and chemist for the Pennsylvania Lead Company of Pittsburg; and then again chemist for the Penna. Salt Company. From Natrona he went to the management of the works of the Kansas City Smelting and Refining Company. Leaving Kansas City two or three years later, he became chemist for the C., B. & Q. R. R., at Aurora, Ill. This position he resigned in the spring of 1885 to take that of general manager of the Mingo Furnace Company, which he held to his death. In each and all of these positions Mr. Tilemann has displayed rare ability, energy and thoroughness, and an integrity and honesty of purpose and action which cannot be too highly valued, and his death is a great loss to the profession. There was a rare quality in his character that impressed every one with the fact that he was generally true to the right in all of his dealings, and this truth of purpose, and thought, and action was just as strongly shown in the theoretical and scientific side of his mind as in his practical life."

INDUSTRIAL NOTES.

The Estill Furnace, of the Red River Iron-Works, Estill County, Ind., went into blast on the 1st inst.

The Paducah Iron Company, of Paducah, Ky., has awarded the contract for the erection of the necessary buildings for its furnace plant.

Messrs. Robert A. Keasbey & Co., New York agents for the Magnesia Sectional Covering Company, report recent important orders, notable from large brewing firms.

The Krupps, of Essen, Germany, are reported to be buying lands in Ekaterinosloff, Russia, where, it is said, they will establish a factory in which to manufacture guns for Russia.

A charter has been granted to the John T. Lewis & Brothers' Company, of Philadelphia, Pa., which has a capital of $700,000, and proposes to manufacture and sell paints and other chemicals.

At the meeting of the Western Wire Nail Association on the 6th inst., it was decided to enforce the new schedule, advancing prices 15 per cent, which was agreed to at a recent meeting held at Cleveland.

The Belfont Iron Works Company, of Ironton, Ohio, whose plant was closed down about two months ago to make extensive repairs, has started up again full time in all departments. During the stoppage one gas-producing furnace and two heating furnaces were added to the plant.

Frankstown Furnace, at Frankstown, Pa., operated under lease by James Pierpont, has been levied on by the sheriff on executions issued by G. W. Jackson & Co., J. R. Reynolds and W. F. Reynolds. The furnace has been in operation about two years, and was making about 20 tons per day.

Alfred C. Chapin, Mayor; Thomas B. Rutan, Chairman Memorial Committee; John McCarty, President Board of Aldermen, of Brooklyn, have extended the time for the reception of designs for the Soldiers' and Sailors' Monument, to which we referred in our issue of August 4th, to October 10th.

The capacity of Lookout Rolling-Mill, at Chattanooga, Tenn., is to be increased so that iron bars of 130 feet in length can be turned out. Ten years ago the same mill ran a bar ten feet long, but now it is so arranged, it is said, that the cost of running 100 feet is no more than running 30 feet.

The extensive improvements now being made to the Soho Furnace of the Moorhead-McCleane Company, at Pittsburg, Pa., are rapidly approaching completion, and when finished the furnace will have a capacity almost double what it was before the improvements were commenced. It is expected that the furnace will be ready to commence operations about October 1st next.

The Novelty Steel Wheel Company has been organized at Pittsburg, Pa., with a capital stock of $500,000. It is proposed to go into the manufacture of steel vehicle wheels, the invention of Dr. A. C. Hall, formerly of Colorado, but now located in Pittsburg. The town of Little Washington has made special inducements to the company to locate there, and the company has accepted them. A plant costing $100,000 will be erected immediately, having a capacity of 30,000 wheels yearly, or 100 sets per day.

The employés of Jones & Laughlin's American Iron Works, of Pittsburg, Pa., have organized a beneficial association. None but those employed in the machine shop, polishing mill, foundry, chain factory, bolt factory and pattern shops and roll turners are eligible to membership in the new organization, which will pay to a sick or disabled member incapacitated for work $5 per week, and in case of the death of a member, $100 to pay funeral expenses. The association has an initial membership of 150.

An effort is being made to start up the plant of the Cartwright Iron and Steel Company, at Steubenville, O., which made an assignment about two months ago. The works were formerly known as the Alikanna Rolling Mill. The unsecured claims amount to $45,000. Some of the heaviest creditors now propose that the company give long-time notes for 40 per cent of the indebtedness in full satisfaction of the same, the notes to bear 6 per cent interest. Then the company will spend $10,000 in making betterments to the plant and resume operations.

The first full cargo of iron ever shipped North, says the Atlanta *Constitution*, was carried out recently from Savannah, loaded for Philadelphia, on the new freight steamship "City of Birmingham," of the Ocean Steamship Line. The iron came from Birmingham, via the Central Railroad of Georgia, and indicates the growth of the new industry in the South. The cargo consisted of 121 car loads, or 2072 tons of pig metal, and the steamer went out drawing 16 feet 8 inches mean draft. After discharging her cargo at Philadelphia the Birmingham will go to New York and load railroad iron for Savannah. While large quantities of pig iron have been going East via the Central Railroad and its ocean steamers from Savannah, this is the first full cargo that has ever gone from any Southern port.

Some months ago the Carbon Iron Company, of Pittsburg, Pa., secured control of the Fort Pitt Iron and Steel Works, in that city, and have since been busily engaged in making extensive additions and changes at the plant with the object of making the manufacture of structural steel a specialty. Mr. Horace W. Lash, formerly with Park Bros. & Co., Limited, of the Black Diamond Steel Works, was secured as general superintendent. Mr. Lash is the inventor of the well-known Lash steel melting furnace, which was illustrated in the ENGINEERING AND MINING JOURNAL of July 7th. The company has just finished the erection of an open-hearth steel-melting plant consisting of two 15-ton Lash steel melting furnaces, and has commenced the manufacture of steel. It has also put in a large universal mill that was completed on the 1st of September to furnish universal rolled plates 36 inches wide of any length or thickness required for structural purposes. Also slabs from 6 to 30 inches wide, and from 2 to 6 inches thick, and blooms from 4 to 8 inches square. The mill has been run to work down its bearings.

HUDSON RIVER TUNNEL.—According to reports there are good prospects of work being resumed on the Hudson River Tunnel. A loan of $5,000,000 has practically been negotiated in England, and the first installment of capital is expected daily. The company has been incorporated in this State and New Jersey since May, 1873, and about $2,000,000 has already been expended for tunnel work. It is a twin tunnel, and the excavations have progressed about 2000 feet and 700 feet from the New Jersey and New York shores respectively. It is thought that two years will be required to complete the most advanced underground channel, and it is estimated that $10,000,000 will cover the cost of the tunnel exclusive of approaches. The points in the two cities where the tunnel work proper will terminate are the foot of Fifteenth street, Jersey City, and the foot of Morton street, this city.

The bonds of the corporation issued abroad are called first mortgage 5 per cent, with gold security. Interest is guaranteed up to January 1st, 1893. It has been announced in England that the tunnel will be completed under the supervision of Sir John Fowler and Benjamin Baker, engineers of the Forth Bridge. The latter has made a careful inspection of the work, and it is entirely satisfactory. Among the facts represented to capitalists on the other side are these: The charge for passenger traffic through the tunnel will be five cents per head, and estimating on a basis of 30 per cent of the passengers and 5 per cent of the freight now crossing the North River as the business of the tunnel, its projectors figure out a net profit of more than three times the amount required to pay the interest on the whole amount of bonds proposed to be issued.

The new works of the Columbia Rolling Mill Company, at Jersey City, N. J., are now in successful operation. The company has been carrying on operations for five years, but owing to increased business moved the works to Jersey City. The company was organized for the purpose of utilizing and manufacturing from waste material, which can be gathered in all large cities, what is called taggers iron, taggers tin, and ferrotype plates. The process employed is very simple, consisting essentially in heating the material from three to five minutes, which has the effect of burning off all extraneous material and rendering it suitable for further treatment. In the bottom of each of these heating furnaces is a small hole, which allows the solder or lead to run into a receiving basin. About 200 pounds of lead is thus obtained from a ton of waste material. This lead is sold at a price not exceeding 16 cents a pound. But it is now proposed by the company to manufacture this tin into what is called putty powder. This will then bring a price of about 90 cents a pound. This putty powder is principally used for polishing marble. After the waste material has been taken from the furnace and allowed to cool, the scrap is sorted, the smaller pieces being thrown out and used for other purposes, such as lids for blacking boxes, etc. The sheet metal is now passed under a rubber coated roll, which flattens it out, the rubber being used so that the sheets are not hardened, which would require them to be annealed. The metal, in packs containing several sheets each, is next passed between chilled iron rolls, which reduce the thickness. They are then annealed and repassed through the same rolls and trimmed up to the finished size, after which they are given their final annealing, when they are sorted and ready for shipment. The taggers iron, as thus produced, may now be further finished by being japanned, tinned, galvanized, or otherwise treated, depending upon the use for which it is designed to be put.

CONTRACTING NOTES.

Machinery and supplies wanted. See page xiv.

Contracts open will be found on pages xiv and xv. New contracts this week: No. 1043, Sewer Construction; No. 1044, Water-Works; No. 1045, Light-House Construction and Erection; No. 1046, Dredging; No. 1047, Construction of Stone Jetty; No. 1048, Wrought-Iron Bridge; No. 1049, Construction of Superstructure of Breakwater; No. 1050, Sewerage and Drainage; No. 1051, Sewers; No. 1052, Construction of Levees; No. 1053, Sewers; No. 1054, Enlargement of American Museum of Natural History, and Supplies, Metal Work, Engines, Pumps, Electric Machinery; No. 1055, Sewers, Excavations, Masonry Work, etc.; No. 1056, Repairing and Resetting Four Boilers; 1057, Dredging.

The Jersey City Board of Works has received bids for purifying the present water supplies and for a new supply outright. The bids include the erection of a plant capable of aerating 24,000,000 gallons daily, as follows: Jewell Water Company, of Chicago, $263,975; Philadelphia Water Purifying Company, $210,000; United States Sanitary Filter Company, of New York, $250,000; Hagerman & Olyphant Filter Company, $275,000; American Filter Company, of Chicago, $250,000; Hyatt Pure Water Company, $350,000. The proposals for the new water supply was for the delivery at the Belleville reservoir of 20,000,000 gallons daily. The Montclair Water Company, which proposes to obtain its supplies from the upper Passaic, bid $40 per 1,000,000 gallons, and the Lehigh Valley Railroad, which proposes to use the Morris Canal to bring water from Lake Hopatcong to Jersey City, $42 per 1,000,000 gallons. A public meeting will be held September 8th to discuss the entire question.

GENERAL MINING NEWS.

TENNESSEE COAL, IRON, AND RAILROAD COMPANY.—Official advices to us show that the coal received directly from the mines, Tracy City division only, during August, amounted to 14,522 tons of coal and 11,285 tons of coke, and from January 1st, 116,071 tons of coal and 103,872 tons of coke.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including

August 29th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1888.	Tons. 1887.
Marquette, Marquette District	455,480	572,443
St. Ignace, " "	71 100	43,950
Escanaba, " "	504,006	381,994
" Menominee District	621,028	572,708
" Gogebic District	117,176	...
Ashland, " "	639 833	433,541
Two Harbors, Vermillion District	210.315	196,552
Total tons	2,612,968	2,201,188

The Omaha & Grant Smelting and Refining Company, at Denver, in answer to a letter from Idaho asking about the new zinc process (see ENGINEERING AND MINING JOURNAL, August 18th, 1888, page 134) and if the company would buy zinc ores, says: "As to the zinc process, it is not yet in operation. All we propose to do at this time is to erect a small plant of eight tons capacity as an experiment. Cannot say what the result will be, or that it will be a success on a large scale. It is a question if zinc will ever be paid for in the ore, in addition to the lead. The only probable benefit the new process, if a success, will be to the mines may be a reduction in cost of treatment of ores carrying zinc."

ALABAMA.

CLAY COUNTY.

ALABAMA GRAPHITE MINING COMPANY.—This company is working the graphite mines situated a few miles from Talladega. Work was begun opening the mines and preparing the product for the market about two years ago, and at the end of the year's work the outlook was so large that an increase in machinery was decided upon. It is now arriving and is being transported to the mine. A new separating house is now being built. A new dam with an immense force of water for washing the ores has just been completed, and a twenty horse-power engine for working the crushers, screws, washers, etc., is already in place. When the works resume operation again with all the new improvements, the capacity will be about two tons a day. The mine is the only one developed or in operation in the South.

ALASKA.

Our correspondent sends us the following:

There is considerable activity in Alaska mining this season. The "Bear's Nest" mines have changed hands and the new owners are in possession.

The air compressors, etc., for necessary development work are now in place.

The ledge was exploited by diamond drill for a distance of 440 feet, and the sample cores were satisfactory to the purchasers. The apex of the ledge is much higher than that of the Treadwell property, and shows good croppings for a considerable distance. The diamond drill driven across the ledge showed vein matter 320 feet wide and still in ore when drill was stopped. This group is owned by English capitalists, doing business under the name of the "Alaska Gold Company," with principal office at Portland, Oregon.

The Alaska Mill and Mining Company has completed its addition of 120 stamps, and is now running 240 stamps under one roof. The mill is a raw amalgamation and concentrating plant. The concentrates are roasted and lixiviated. The roasting furnaces, with new automatic attachments, after some changes, are now running satisfactorily.

A property in Silver Bow Basin has been purchased by a Seattle company, which has ordered a ten-stamp concentrating mill, and reports that it will be in operation in about 90 days.

Mr. T. S. Nowell has represented that he has made a rich strike high up the mountains in Silver Bow Basin. He is collecting a fine lot of specimens from that vicinity to take back to Boston.

He also states that he will commence a libel suit against the ENGINEERING AND MINING JOURNAL as soon as he arrives in the East.

Mr. Nowell has probably forgotten that when he was trying to enlist help in his "Alaska Bubble Scheme" he stated to a party that he was the best stock organizer there was in the United States, and that it was a cold day when he got left; and if the party would stand by him he would make him a rich man.

ARIZONA.

PIMA COUNTY.

An experienced millman from San Francisco has gone to Quijotoa District to prepare for the early starting up of the Peerless mill upon ore from that and the Weldon mine.

CALIFORNIA.

AMADOR COUNTY.

DOYLE MINING COMPANY.—This company has been organized with a capital stock of $500,000, shares $2 each. The directors are William Doyle, Burt Olmsted, George Thomas, Richard Webb, A. Ginocchio, L. Newman and C. D. Horne. The stock is nearly all in the hands of W. Doyle, who proposes to raise a working capital to develop the property by offering 100,000 shares of stock at the low price of 25 cents per share. Over 8000 shares have been disposed of among the directors. It is designed to start work upon the claim just as soon as sufficient stock has been disposed of to warrant the commencement of operations. The mine is located in Hunt's gulch, and lies between the Amador gold mine and the Amador Queen mine.

BUTTE COUNTY.

BIG BEND TUNNEL AND MINING COMPANY.—The electric power plant at the Big Bend Tunnel has now been in practical operation for two months. The electrical engineer in charge has been withdrawn from any further superintendence of the plant, and Dr. R. V. Pierce, the president of the company, writes to the Sprague Motor Company that the whole system is working smoothly under his own direction, and is a demonstrated success.

COLORADO.

We have received the following statement, which shows the gold and silver bullion deposited at the mint of the United States at Denver during August, as follows:

	Gold.	Silver.	Total.
Colorado	$113,928 98	$1,205.99	$115,134 97
Arizona	4 67.65	48 09	4,655.74
New Mexico	7,540.80	65 22	7,606.02
Wyoming	372.82	2.02	374 84
Jewelry	802.52	15.88	818.40
Re-deposits	142.50	2.66	145 16
U. S. Com	250 00	.....	250.00
Total	$127,645.27	$1, 39 86	$128,585.13

Gross weight deposits for August, 8,238·46 ounces; net weight deposits for August, 7,927·23 ounces; net weight base removed, 311·23 ounces; average per cent base removed, ·037; average fineness, gold, ·779; average fineness, silver, ·215.

Our special correspondent sends us the following under date of August 26th:

During a recent visit to the southern part of Colorado I had occasion to spend a few days in Silverton, and was much struck by the air of dullness that seemed to pervade the place. I could not understand it at first, as the town is beautifully located on the Animas River, between Mineral and Cement creeks, and is the most central and accessible point in a very large and rich mining region. Ore comes down hill to Silverton from all directions; there is an abundance of water power, and a large number of rich mines, whose ores must, of necessity, be sent to the town for shipment to the smelters. No element of prosperity seemed wanting, yet it was very evident that the town was not prosperous. The causes were not difficult to find. Mine wrecking, aided by the selfish policy of the railroad company in charging "all that the traffic will bear," has done the work. A game of "freeze-out" seems to be going on in connection with a number of the best properties in the region. In other cases, ignorant and extravagant management has resulted in the closing of good mines, after the working capital of the owners was exhausted. A good many people have gone away, and others are going as soon as they can find places to go to.

Mining property is cheap. Holders, whose heads were in the clouds a few years ago, would now be glad to sell at very reasonable figures. A good judge of mining property, if he keeps cool and takes his time, can make money in San Juan County during the next year or two, as there is sure to be a revival of business in that section. The mines are too good to be permanently closed.

A railroad is now building up Mineral Creek, and cars are running as far as Chattanooga, about six miles from Silverton. The road is graded some distance farther, and it is expected that cars will be running to Red Mountain before winter sets in. I did not stop at Red Mountain, but passed through the place on my way to Ouray. Everything looked brisk and lively, and most of the mines were in operation. I am told that the mine waters of this region give a great deal of trouble, destroying the pump columns by their corrosive action.

The railroad company intends to complete the road to Ouray next year. Theoretically, this ought to benefit the mines of Red Mountain and Poughkeepsie Gulch, but I fear the benefit will not be as great as it might be. The president of the railroad company is the owner of the wagon road, which will be destroyed by the building of the railroad, thus placing the mine owners completely at the mercy of the railroad company. The railroad companies of this section resemble the wicked in this particular that the tender mercies of both are cruel.

It seems a pity to spoil such a magnificent cañon as that of the Uncompahgre by running a railroad through it. No finer drive can be found in this State than that down the Uncompahgre to Ouray. And when Ouray is reached, the man who is not charmed by its surroundings has no eye for the beautiful.

Business seems to be good, the hotels are crowded, and the town has an air of prosperity that is refreshing.

I shall visit some of the mining camps of Boulder County next week, and will tell you what I see.

ELK MOUNTAIN FUEL COMPANY.—This company has been organized with a capital stock of $2,000,000. The company proposes carrying on its business in the counties of Arapahoe, Garfield, Pitkin, Gunnison and Mesa. The directors are: John C. Osgood, Samuel N. Wood, Henry R. Wolcott, Julian A. Kebler and Daniel C. Beamann. The object for which the company is formed is to mortgage, loan or sell coal lands, to prospect for, develop mine or sell coal and other minerals, manufacture coke, etc.

BOULDER COUNTY.

CARIBOU.—This mine has closed down for an indefinite period, and the force discharged. During the past year the mine produced about $90,000. During the year, the drifts on the No Name vein have been pushed westward, but the shaft has not been touched. The display of ore in the drifts is said to be better than it has ever been.

EAGLE COUNTY.

The owners of the Iron Mask mine at Red Cliff, have leased their quartzite shaft, and the Polar-Accidental folks are watching them to claim any talc ore that they may think comes from the Polar-Accidental ground. The Denver *Mining Industry* says: "This may bring about the much talked-of suit between the lime contact owners and the quartzite owners of Battle mountain. Recent developments in the Polar-Accidental are quite conclusive of the belief that a great fissure vein cuts down through the quartzite, and that the flat bodies of ore and that in the caves heretofore worked upon have been deposited by an upward flow from a great vertical vein. All the chutes are one after another dropping off into what appears to be a great vertical vein, at least such is the report received at this office."

GARFIELD COUNTY.

The first car-load of ore ever shipped from Camp Defiance was taken east over the Rio Grande Railroad on August 23d. It came from the Grand View mine. The mineral is a carbonate of lead and galena, running 50 per cent in lead and about 20 ounces in silver More than a dozen men have been at work there this summer. Reports state that from the exploitation that has been done there is a brilliant promise of this camp proving itself the El Dorado it was claimed to be before the carbonate excitement of '83. Already there are three good bodies of ore opened up. Several lodes on which only the assessment work has been done are soon to be worked extensively.

This camp is on the north side of Grande River, six miles and a half above Glenwood Springs. Arrangements are being made to put a bridge across the river to the Rio Grande road.

GUNNISON COUNTY.

On Yule Creek, in this county, a large carbonate of lead and iron contact has been found to underlie the marble beds for which these locations were originally made. It is thought now that this contact will prove valuable in silver and lead, and the owners are to be congratulated upon possessing a unique property. Says the Denver *Mining Industry*: These miners need not to dream of dwelling in marble halls, but can actually do so while visions of wealth run riot in imagination.

LAKE COUNTY.

LILIAN MINING COMPANY.—This company is opening a large body of good smelting ore in the place where it was struck a few months ago. The ore lies in the contact plane between the porphyry and the lime. In the breast of the workings the ore-body now shows 15 feet thick. It has not been so much anywhere else, so far, but there has always been a good-sized body. The ore carries about 30 per cent lead, a little silver, and the remainder of its value in gold. The company is now shipping about 600 tons of ore per month, the output going to the Harrison reduction works. The company is also mining some low-grade gold ore for the mill in some of the old stopes. The mill is at present idle, but will be but in operation soon after the first of September.

PITKIN COUNTY.

The ore shipments from Aspen for the week ended August 31st amounted to 2338 tons, of which 413 tons went to Leadville, 1445 tons to Denver, 292 tons to Pueblo, 48 tons to Durango, 10 tons to Salt Lake and 130 tons to Kansas City.

SAN JUAN COUNTY.

NORTH STAR.—The lost ore-body in this mine was struck again on August 30th. It was found in the seventh level in a cross-cut from the bottom of a ninety-foot shaft. The ore body is said to be three feet wide, solid gray copper. The owners are increasing the force at the mine.

SAN MIGUEL COUNTY.

GOLD AND SILVER MINING COMPANY.—This company, of Crawfordsville, Indiana, has started work on the properties in Bridal Veil basin. The Cliff and Mansion are the claims worked. The other claims, the Ledger, the Pan-Handle and the Opolusas will be developed by the same tunnel. All the lodes are gold-bearing, and the Cliff and Mansion promise especially well. About $4000 has so far been expended in development work.

SUMMIT COUNTY.

VICTORIA MINING COMPANY.—The property owned by this company on Farncomb Hill has passed into the possession of a California syndicate who intend to push developments at the mines. G. L. Havens is in charge of the property, and will at once erect several Huntington mills, a saw mill and other necessary appliances, working upon an extensive scale.

WIRE PATCH GOLD MINING AND MILLING COMPANY.—The company has decided to at once put in four Huntington mills, in addition to the two now in operation. This will give a treating capacity of from 60 to 65 tons daily. The management will continue to make improvements and increase milling facilities as developments seem to justify. We referred to the organization of this company, in which St. Louis parties are interested, in our issue of April 21st.

DAKOTA.

LAWRENCE COUNTY.

CALEDONIA MINING COMPANY.—The company's additional twenty stamps are ready to begin operations.

EQUITABLE MINING COMPANY.—This company has organized with a capital stock of $1,250,000, shares $5 each, it owns the White Pine and two fractions on the Tornado hill, Bald Mountain district.

PENNINGTON COUNTY.

Local papers report that Chicago capitalists will build a mill on the Madill Poznansky property. The location is stated to be a short distance north of the Etta mine road, three or four miles east of Etta, and

about ten miles west of Hermosa. The tin property is considered the best in that locality. The owners have for a long time been endeavoring to improve it upon a larger scale than mere assessment work, hence the report that Chicago capitalists have been enlisted to place money in the building of a mill for the working of tin ore is considered plausible.

IDAHO.

We have received very unfavorable reports concerning the Alturas Gold, Limited; the Rocky Bar, the Wide West, and the Oro Fino mines in Idaho, held in England, and shall publish fuller particulars in our next issue.

ALTURAS COUNTY.

The owners of the O. K. mine have obtained an injunction restraining the owners of the Red Elephant group of mines from extracting any ore from ground claimed by the O. K. Company.

PINE GROVE MINING COMPANY.—The new mill has been running steadily for several weeks, and is doing good work, crushing an average of 15 tons per 24 hours, on which the company realizes, it is said, a profit of $20 to $30 per ton. The company employs 40 men in the mines and five at the mill. Most of the force is employed in development work, and the property is opening up satisfactorily.

CUSTER COUNTY.

DICKENS-CUSTER COMPANY, LIMITED.—The company has resumed operations. Twenty men were put to work on the Lucky Boy and the mill has started up.

ILLINOIS.

MORGAN COUNTY.

JACKSONVILLE COAL MINING AND MANUFACTURING COMPANY.—The capital stock of this company has been increased from $35,000 to $40,000.

INDIANA.

The National Federation of Miners and Mine Laborers began its fourth annual session at Indianapolis on the 4th inst. Delegates were in attendance from Pennsylvania, West Virginia, Missouri, Illinois, Ohio and Indiana. The official reports showed that the membership had grown during the last year and that the federation had been successful in protecting miners along the lines designated in the purposes of the organization, its schedule of wages having been accepted throughout the mining regions. It has been decided to adopt a new scale of wages at a meeting to be held in that city next February. Among the questions discussed was the shortening of working days. A resolution to make eight hours a day's work was adopted, the pay to be regulated hereafter by the output of coal. A committee representing the Knights of Labor is at Indianapolis for the purpose of urging that the federation shall be merged with the Knights. There is much strong feeling against the Knights.

KANSAS.

LEAVENWORTH COUNTY.

BRIGHTON COAL AND LAND COMPANY.—Messrs. Whiteside & Jarvis, of Kansas City, have sold 1600 acres, situated near Leavenworth, to this company, it is said, for $240,000. The company will sink shafts and develop the new purchase. Philip Doppler, Mr. Troast and others, of Kansas City, and Mat Ryan, of Leavenworth, are the organizers of the company.

LOGAN COUNTY.

The discovery of a rich deposit of nickel at Russell Springs is reported by press dispatches, and a "mining fever" is the result.

MARYLAND.

PIEDMONT COAL AND IRON COMPANY.—The company has commenced development of its coal lands in the vicinity of Bloomington. There are three openings—6, 4, and 5-foot veins.

ALLEGANY COUNTY.

MARYLAND COAL COMPANY.—Extensive improvements are in progress at the Kingsland mine of this company that will increase the capacity of that mine. The coal will be hauled out of the mine by the engine instead of horse-power as at present.

MICHIGAN.

SUPERIOR GOLD AND SILVER MINING COMPANY.—This company has been organized with a capital stock of $2,500,000, the maximum allowance by the state laws, to mine for gold on the New Range. Peter White, of Marquette, a banker, is the principal shareholder.

COPPER MINES.

CALUMET & HECLA MINING COMPANY.—It is stated that the time is not far distant when the Calumet & Hecla Mining Company will divide its mine, setting off the South Hecla or Black Hills in a distinct corporation. From September 1st Calumet will surely earn $40 per share a year and probably more. Under the present laws of Michigan it can not increase its capitalization over 100,000 shares. It could make two mines of 100,000 shares each, and either be worth nearly what the whole is selling for to-day.

IRON MINES.

SAMSON MINING COMPANY.—This company, which owns the old Argyle mine at Humboldt, is now investigating the bottom of the mine where the mud, débris and waste rock will permit; a fairly good seam of slate ore and 5 feet of granular magnetic—assaying 64·4 iron, 7·12 silicon, ·031 phosphorus—has been found. The company is about to build a skid road to it, breaking through to old workings via Sewood shaft. A seam of black magnetic ore, south of all old workings, has been opened, which is now some 15 feet in width, and of excellent grade. Power drills, for the first time in the history of the mine, are in use. Diamond drilling is also under way west of all present workings, which will be sunk a depth of about 300 feet.

MINNESOTA.

MESABA IRON COMPANY.—This company, which has been doing nothing for many years, is now making arrangements for the working of its lands under lease, says the Duluth *Herald*. This company was in existence and secured 6000 acres of lands along the Mesaba range years before the wealth of the deposits of the Vermilion range, 20 miles north, had been dreamed of.

MONTANA.

SILVER BOW COUNTY.

The long-contested mining suit of Murray against the Smoke House lode, at Butte, which embraces the best portion, has been settled, the deed conveying Murray's interest being placed in escrow.

NEVADA.

ESMERALDA COUNTY.

SILVER PEAK.—Arrangements have been made under which a group of English capitalists will expend a considerable amount of money during the next few months opening up the extensive mines now owned by "The Silver Peak Mines" Corporation in the Silver Peak and Red Mountain mining district. A conditional sale of the property has been made, but both the selling and the purchasing companies have desired to have the value of the property and of its ores most thoroughly tested before any money is to be paid over. Exploration on an extensive scale is to be immediately begun under the direction and management of Messrs. Taylor & Brunton, of Leadville.

EUREKA COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—Charles W. Ladd, head man at this company's cupels, was arrested on the 23d ult., says the Eureka *Sentinel*, and held in $4000 bail, on the charge of stealing silver bullion from the company. He had been spending money extravagantly, and the company had been losing bullion, but how they couldn't find out. At last it was found that Ladd was sending, as of no value, alleged mineral specimens to a jeweler in Chicago, and on opening one of these boxes two chunks of Eureka Consolidated bullion were found. Ladd confessed his guilt. He was employed some years ago by the Richmond Consolidated Mining Company, and then went to Pueblo, Colo., where he was employed at one of the smelting works, and returned to Eureka shortly after the Eureka Company started its refinery.

NEW MEXICO.

GRANT COUNTY.

The Flagler works at Silver City have started up and are running one blast-furnace on copper ores from Hanover.

CARLISLE GOLD MINING COMPANY.—A little less than a year ago, says the Silver City *Sentinel*, the English stockholders placed on deposit, subject to the draft of the resident superintendent of this company, the sum of $250,000 to be used in improvements on the mine and mill. Of this amount there was less than $10,000 drawn, and the product of the mine has paid for the construction of a smelting plant, besides adding to the stamp mill already built forty more stamps, and paying in the neighborhood of $100,000 in dividends. The total cost of mining and milling a ton of ore is a little less than $1 per ton. The mine is now five hundred feet in depth, and the ore-bodies at this depth maintain its surface dimensions, besides carrying a greater percentage of gold per ton. The present success of the company is largely due to the untiring efforts of Mr. John H. Longmaid, the general manager.

SAN PEDRO & CANON DEL AGUA MINING COMPANY.—The arrangements for the reorganization of this company have been about completed. Hon. Jay N. Hubbell, of Michigan, who is at the head of the new company, is in Boston, and he has obtained the consent of the local interests in the mine to his plan. The new company is called the Santa Fé Copper Company, and it is capitalized at $5,000,000, shares $10 each. Of this stock, 100,000 shares is in the treasury, while outstanding stock is given in settlement of old claims. The Boston *Transcript* says that the new company has harmonized all dissension, and pending litigation will be dropped, all contending parties coming into the plan. The proposition is to give one share of stock of the Santa Fé company in exchange for two shares of San Pedro preferred or four shares of San Pedro commonstock. The formal vote to ratify the plan of settlement was taken in New Mexico on the 6th inst., when representatives of conflicting interests brought the long contention to an end by affirmative action. It is proposed to issue fifty thousand shares of the treasury stock of the new company at $2 per share to obtain funds for proceeding to the immediate improvement and development of the mine. The company has two smelters at work and another is to be put up at once, each being of 25 tons capacity. A fourth smelter of 50 tons capacity is to be put in, and the company expects that next summer, when fully equipped, it will mine 1000 tons of ore per day. The vein is 20 feet wide, and the work now doing gives 10 tons of blister copper per day. The mineral yields 10 per cent copper, and the total cost of producing and marketing is 10 cents per pound.

SOCORRO COUNTY.

LIBERTAD MINING COMPANY.—The mill of this company at Sabinal was to commence work last month with a new management.

NORTH CAROLINA.

Cherokee County has voted $50,000 to aid in building a road from Chattanooga to Murphy, and this, it is said, insures its construction. This road will secure the development of the iron ore and copper wealth surrounding Murphy.

OHIO.

Questions concerning the price of mining coal by machinery in this State were settled by arbitration between the miners and operators. John McBride, President of the Ohio Miners' Association, represented the miners, and each of the mines using machinery was represented. The rate of driving entry by machines was increased 2½ cents; also the rate for turn work, loading, etc., was advanced. Mr. McBride also reports that the anticipated general strike in the south end of the Hocking Valley has been averted by the operators conceding every demand of the miners, viz.: The reinstatement of the objectional check-weighman and pay in the future for breakthroughs between rooms.

COLUMBUS & EASTERN COAL COMPANY.—This company, a reorganization of the old Buckeye Creek Coal and Iron Company, will probably construct a switch up Green Hollow, and another up the south fork of Buckeye, which will give it access to the best low vein coal in the valley.

PENNSYLVANIA.

COAL.

The Schuylkill Coal Exchange, Pottsville, publishes the following report dated September 3d: The collieries drawn to return prices of coal sold in month of August, 1888, to determine wages to be paid, make the following returns: Alaska Shaft (P. & R. C. & I. Co.), $2.52; Bast Colliery (P. & R. C & I. Co.), $2.58; Boston Run Colliery (P. & R. C. & I. Co.), $2.48; Knickerbocker Colliery (P. & R. C. & I. Co.), $2.43; Kehley Run Colliery (Thomas Coal Co.), $2.45. The average of these rates is $2 49·7, and the rate of wages to be paid is the $2.50 basis.

LATTIMER.—A serious mine fire is in progress five miles north of Hazleton, at the Lattimer colliery, operated by Pardee Brothers. A portion of the workings, known as the counter chute on the inside of the slope, which was abandoned over a year ago, was ignited on the 5th. It was impossible to get close to the fire on account of the bad air and heat, and lines of hose were found useless. It was decided on the 6th to adopt the plan of drowning out the mine, and to this end a stream of water known as Black Creek was turned into the workings. Should this be successful, the fire will not spread to the adjoining workings of that section, which are all connected.

MOUNT PLEASANT COAL COMPANY.—A terrific explosion of mine gas occurred at the colliery of this company, at Scranton, on August 31st, working ruin and destruction to the mine and causing the death and injury of a number of employés. It is reported that the mine has been flooded.

PHILADELPHIA & READING COAL AND IRON COMPANY.—An explosion of gas occurred at the company's Monitor Colliery, Mount Carmel, on the 6th inst. Assistant Superintendent Charles Brecker, a miner and a boy were seriously injured. The damage to the colliery is extensive. The gas was ignited by workmen engaged in turning a current of air into the adjoining Merriam Colliery.

SOUTHWEST COKE COMPANY.—This company has made a voluntary advance of 5 per cent in wages. The company controls about one third of the ovens in the Connellsville region.

OIL.

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

	1888. Gallons.	1887. Gallons.
From Boston	2,564,848	2,875,035
Philadelphia	86,784,607	108,511,880
Baltimore	5,455,249	5,859,652
Perth Amboy	15,475,935	10,424,592
New York	234,853,056	249,283,877
Total exports	345,133,695	376,955,036

The North Side, McKeesport, oil well, which was recently abandoned, suddenly began to flow on the 3d inst. In consequence of this development it will be drilled deeper.

At the meeting of the Oil Producers' Association, held at Bradford, Pa., on the 6th inst., the drilling contracts were adopted, and it was agreed to continue the shut down for six months longer. This does not affect the output of the old wells, but prevents the drilling of new ones. A new arrangement for pooling their oil was made.

GLOBE REFINING OIL COMPANY.—This company, of Pittsburg, will build a large refinery at Point Breeze, Philadelphia, to be fitted throughout with the most improved machinery.

RHODE ISLAND.

The Worcester Steel Company has purchased the property known as the Portsmouth coal mines, and state that is the intention to begin work in a few weeks, and to mine a hundred tons of coal daily. It is highly probable that the steel company will remove the whole of its plant to the coal mines. The company occupies five acres of land in Worcester near the Boston & Albany Railroad, which that corporation, it is said, is anxious to get possession of.

TENNESSEE.

Mr. H. B. Wetzell, of Knoxville, Tenn., during his recent visit to England, has secured the co-operation, it is said, of English capitalists in the development of coal and iron property owned by the Unaka Land and Timber Company. It is reported that a company with a capital of $750,000 will be formed for that purpose.

TEXAS.

Over 2000 tons of coal were taken out of the Santomas coal mine, situated thirty miles above Laredo, during July, and in order to supply the demand the force has been increased.

It is reported that the outlook in Laredo seems to be good for building. Good brick are now worth $3.75, and the Mexican National Railroad Company will soon commence to erect the largest railroad shops in Texas. In Laredo a concentrating plant for ore is now being built, and same will start up as soon as sufficient cars can be had from the railroad company, which will probably be this winter, when the Mexican National Railroad Company will have made through connections from Laredo to the City of Mexico.

CASS COUNTY.

Prospecting for coal and oil has been done near Queen City, and a vein of coal, which is five feet in thickness and of good quality, has been struck. Negotiations are pending with northern capitalists, and if the coal proves to be in sufficient quantity a large shaft will be sunk.

UTAH.

The Hanauer, Germania and Mingo smelters, which have been closed down for 40 days, have commenced operations again, owing to the improved condition of the lead market.

The manufacture of salt around the shores of Salt Lake is an important and growing industry. Nearly all the land adapted to the purpose has been appropriated by settlers. A level meadow is usually selected, a few inches above and adjacent to the water of the lake. The surface of the soil is scraped and made level and hard like the floor of a brick yard. A storm or high wind will drive the water in from the lake and cover it, and a slight dam will prevent its return. Here it quickly evaporates and leaves a bed of solid salt 6 to 10 inches thick ready for market.

DICKERT & MYERS SULPHUR COMPANY.—At a meeting of the board of directors of this company, held at Salt Lake City August 25th, 1888, pursuant to written notice thereof to each director, three were present, Ferdinand Dickert, John Dull and John A. Marshall, a quorum of said directors. It was resolved:

1st. That, Whereas, on April 17th, 1888, three of the directors of this company held a meeting, and at such meeting authorized the president of the company to execute and deliver to Mrs. Wilma Dickert the note of the company for $22,000, payable ten days after April 18th, 1888, with interest thereon after April 18th, 1888, at the rate of one per cent per month, and also a mortgage of all the company's real estate to secure the payment of said note, and, whereas, A. Faber du Faur, as president of this company, and as its act and deed under the authority aforesaid, executed and delivered to Mrs. Wilma Dickert the note and mortgage aforesaid,

Now, therefore, be it resolved, that the action of said directors in passing said resolution, and the action of said Faber du Faur thereunder, are hereby ratified and adopted.

2d. That, whereas, Ferdinand Dickert, as general manager of this company, has, in the name of the company, borrowed from A. Keyser the sum of $5000, and has, in the name of the company, executed and delivered to said Keyser the note of the company therefor, and has deposited in the hands of said Keyser, as collateral security for the payment of said note, 150 tons of ground sulphur, the property of the company; and, whereas the company has received and used said money so obtained, now, therefore, be it resolved, that the action of said general manager in the matters aforesaid be and it is hereby approved and ratified, and said general manager is hereby authorized to deliver to said Keyser as a further security for the payment of said note an additional 14 tons of said ground sulphur.

3d. And, whereas, charges have been made by some stockholders of this company against Ferdinand Dickert, the general manager thereof, and affecting his competency as general manager; and, whereas, the board of directors has fully investigated such charges and found them untrue, now, therefore, be it resolved, that the action of said general manager in conducting the business of said company has been under the direction of the board of directors, and in accordance therewith, and is in all things commended and approved by it.

Meeting then adjourned until August 25th, 1888, at 4 o'clock P.M., at the office of the company, in Salt Lake City, Utah. At a meeting of the board of directors of the Dickert & Myers Sulphur Company, held at 4 o'clock P.M., of August 25th, 1888, at the office of the company in Salt Lake City, Utah, pursuant to adjournment, present Ferdinand Dickert, John Dull, and John A. Marshall, the meeting having been called to order, the minutes of the last meeting were read and approved. On motion duly made and seconded the meeting then adjourned until Saturday, September 1st, at 11 o'clock A.M., at the same place.

WASHINGTON TERRITORY.

The Conconully mining district has recently been opened in the northern part of the territory. It is located along and adjacent to the Conconully Creek, which is a small tributary rising near the boundary of British Columbia, and following southward to its junction with another stream which flows into the Columbia. The new district is reached by rail from Tacoma to Ellensburgh on the Northern Pacific Railroad, thence by stage 32 miles across the country to a point on the Columbia River, then by boat 120 miles up the Columbia to the Conconully, and from there by a wagon-road up that stream some 30 miles to the mines. The first carload of ore from the Launa mines has just been received at Tacoma. This mine is owned by Mr. Thos. L. Nixon, of Tacoma. The *Mining and Scientific Press* says that the ores of this district are mainly silver bearing, and assay in some instances as high as $1000 per ton. Most of the ores, however, are of much lower grade, ranging in value from $30 to $50 per ton. Little development work has as yet been done on any of the claims, the ore being taken from the surface. The ledges are of good thickness, so that the mining is done with extreme cheapness. The ores being of a class requiring concentration, parties have recently erected a concentrator in the district, so that the miner may get his product into valuable shape before shipping to smelters at San Francisco or elsewhere. These mines are attracting a great deal of attention in Washington Territory, and they promise excellent results for all labor expended upon them. The Tacoma, Ellensburgh & Conconully Railway and Navigation Company is the name of a corporation which is taking in hand the forwarding of passengers and supplies for the new country, and they have already sent a great deal of mining machinery and merchandise to this camp.

BLACK DIAMOND COAL COMPANY.—The company has reopened its mines in New Seattle, after a temporary suspension of operations.

KITTITASS COUNTY.

The Oregon Railway and Navigation Company has bought or leased all the coal lands in the vicinity of Cle-Elum and will begin the work of developing the mines as soon as possible. It is expected that in the near future more extensive coal mines will be in operation near Cle-Elum than now at Roslyn.

SKAGIT COUNTY.

SKAGIT COAL AND IRON COMPANY.—This company has been organized with a capital stock of $1,000,000, divided into 10,000 shares, 3000 of which are to be preferred shares to the extent of 8 per cent per annum. The principal place of business is at Seattle, the duration of the corporation is fixed at fifty years, and the incorporators are as follows: Major W. A. Jones, President of the Portland Reduction Works of Portland, Oregon; D. Drysdale, Eugene Canfield, W. R. Forrest, S. Baxter, J. H. McGraw, E. S. Coullar, F. H. Richards and C. M. Sheafe. The property of this company consists of a large body of coal and iron lands situated on the Skagit River, Skagit County. The coal cokes, it is said, excellently.

WEST VIRGINIA.

It is reported that the property of the Boone & Raleigh Coke, Coal and Railroad Company, and of the Black Band Iron Company, has been sold to L. B. Russell, of Lynn, Mass., for $250,000.

Rich discoveries of minerals in Monroe and Fayette counties are reported.

KANAWHA & YOUGHIOGHENY COAL COMPANY.—This company has been organized with a capital stock of $100,000 to mine coal, manufacture coke, etc. The officers are William Trudgeon, President; William Sharpe, Secretary and Treasurer, and T. G. Hengehold, of Cincinnati, Ohio, Superintendent. The company has purchased the entire property of the Hengehold Coal Company, of Cincinnati.

FOREIGN MINING NEWS.

CANADA.

PROVINCE OF NEWFOUNDLAND.

The copper mining industry has been carried on with fitful success since 1864, but by the year 1879 the development had been considerable, the total value of copper and nickel ores exported up to that date being $4,629,889.

The first copper mine was opened at Tilt Cove, 225 miles northwest from the city of St. John's. At the close of 1879 this mine had yielded 50,000 tons of copper ore, valued at $1,572,154, and nickel ore of the value of $32,740. The mine at Bett's Cove opened subsequently was, however, a greater producer, and in four or five years there were shipped from it 125,556 tons of ore valued at $2,982,836.

In 1878 a new deposit was discovered at Little Bay, and with great facilities for working and mining has been carried on pretty steadily on an extensive scale since that time. At Tilt Cove the work languished, owing to the low price of copper, and finally ceased; but as an instance of how the recent advance in the price of metal has stimulated production and given a living value to defunct concerns, this mine, it is stated, was purchased at the beginning of this year for about $400,000, and resold a few weeks afterward to the representatives of the French copper syndicate for $768,000. There is now quite a strong force of miners at work, and in a recent examination of the property it is reported by the expert that the mass of pyrites has been cut at a right angle to the north wall, 130 feet without finding the south wall. It has been opened from east to west 62 feet over all, and there is no appearance of an end of it in any direction. The whole mass is quite homogeneous; there is no mixture of any rock matter in any part of it. There is at present room for men enough to break 2500 tons a month, and the height from the adit to the surface is about 100 feet. By the present system of working the cost of putting the ore on board ship is estimated at $2.50 per ton.

PROVINCE OF ONTARIO.

SILVER ISLET CONSOLIDATED MINING AND LANDS COMPANY.—All the lands belonging to this company will be sold at public auction, at the Real Escate Exchange and Auction Rooms (Limited), New York, on the 19th inst., in pursuance of a judgment duly made and entered in the action in the Supreme Court, County of New York, Dumont Clarke and another vs. George S. Coe, the Silver Islet Consolidated Mining and Lands Company and others, bearing date June 12th, 1888.

PROVINCE OF QUEBEC.

HARVEY HILL (QUEBEC) COPPER MINES.—The London *Ironmonger* says that it was reported that negotiations were being closed for the sale of the Harvey Hill copper mines, in the county of Megantic (about 100 miles southeast of Montreal), to the Excelsior Copper Company of London (England), with a capital of $450,000. The property comprises 4000 acres of land, upon which twelve shafts have been sunk. Three thousand acres are in fee simple, and 1301 acres of mining rights. The mines are about eight miles from the Broughton Station of the Quebec Central Railroad. It was purchased about a year ago, it is said, from the Union Bank for $100,000, and is now being sold for $1,000,000. [The purchasers will do well to have this property carefully examined before paying even a small part of the million dollars.—EDITOR ENGINEERING AND MINING JOURNAL.]

MEXICO.

THE INTERNATIONAL AND MORTGAGE BANK OF MEXICO.—A new bank is to be organized upon the Banco Hypotecario, an existing Mexican bank, which had the right to issue mortgage bonds against mortgages on real estate not to exceed 50 per cent of the value of mortgaged property. By a change in its charter granted by the Mexican government, the bank becomes the International and Mortgage Bank of Mexico, and a syndicate of New York capitalists assumes the assets and liabilities of the old bank. The founders' shares are recalled, and paid for at par, with $1,000,000 in new shares. The authorized capital of the new bank is $5,000,000, which may be increased to any amount. New shares to the amount of $2,500,000 will be issued to the United States and in Europe. According to the New York *Commercial Advertiser*, Messrs. Hollins & Co., of New York, say that they feel sanguine that the United States and Mexico in combination can control the silver market of the world, and that with a balance in trade of 70 per cent against the latter country there is certainly a great advantage in having clearings made through this city. Another consideration is the increasing amount of capital from the United States invested in Mexico, and the increasing volume of exchange business due to this and to tourist travel.

We take the following from the Mexican *Financier*:

The Department of Public Works has granted the following concessions: To John MacDonald and Manuel Iturbe for the exploration and working of mines of all kinds and gold placers at the Mineral de Guanacevi, Partido de Santiago Papasquiaro, State of Durango. Space 30 by 20 kilometers.

To Francisco Ortega for the exploration and working of mines of all kinds at the place called El Oroche, Municipality of Batopilas, Canton Andrés del Rio, State of Chihuahua. Space 20 by 15 kilometers.

Concentration works are to be built at Catorce, State of San Luis Potosi, where there are many old dumps which will carry from 15 to 25 ounces of silver per ton. These refuse ores can be bought for $1 per ton, and it is estimated that 70 per cent of the assay value can be saved, and that ten tons can be concentrated into one ton at a cost of not over $2 per ton. A wire tramway is to be built down the mountain side at Catorce to connect the town and mines with the National Railway. The mines are from four to eight miles distant from the National road.

LA BLANCA.—At this mine, at Pachuca, at the 220 varas level, driving east, at 25 varas from the shaft, there has been a cut of ore. Picked samples of this ore have assayed, it is said, as high as 116 marks per monton. As the mine is entirely virgin at this side, this find is of greater importance than the find on the western part of the mine near the Santa Gertrudis property. Should the vein continue in good ore, two levels will be immediately opened up to the eastward, when the extraction will be considerably augmented.

MADRONA.—This mine, north of La Noria, Zacatecas, on which are three shafts, two worked by Mexicans and one by an Austrian, there is being taken out quantities of ruby silver, the assays showing $150 per ton. The process used is the patio, and it is said that only 25 per cent of the metal is saved.

MINA BLANCA.—This mine, at Aldama, Chihuahua, which was bought by Mr. Hugh McKay, is being developed, and a stamp mill is to be erected there.

SANTA GERTRUDIS MINING COMPANY.—In this mine the cross-cut south from San Juan shaft to the Amistad mine has intersected a vein, which is two yards wide, of splendid metal. Dividends, therefore, may be expected not only to increase in number, but the future prospects of the mine, for several years to come, are assured.

TAJO.—At this mine, 5 miles to the west of the Madrona Zacatecas, the rock averages $300 per ton of pure native silver. A stamp mill is being built at Sombrerete to treat the ore from this mine.

Our special correspondent sends us the following from the City of Mexico, dated August 26th:

LOWER CALIFORNIA.—A paper published in Julian County, California, says that the gold mines of Lower California are being boomed in San Diego by means of very fine quartz specimens from well-known mining regions located in other quarters. The art of catching the tenderfoot by means of false specimens is not only practiced in Lower California, but also considerably in the "effete East." I know of one set of specimens in a certain city not a thousand miles from New York that has helped to dispose of at least half a dozen mines, and the end is not yet.

The paper above alluded to says that the only mines as yet found in Lower California have yielded gold of inferior quality, and that there is no water to work on a large scale.

SONORA.—A placer yielding precious stones of various species and colors, and more particularly some very beautiful tourmalines, is said to have been discovered near Ortiz Station on the Sonora Railroad.

Mining concessions under the law of the 6th of June, 1887, have been asked for by foreign capitalists to cover points in the districts of Ures, Montezuma, and Arizpe. Several English companies are working in the district of Sahuaripa.

COLIMA.—The Governor of this State says in a recent report to the Secretary of Public Works that there are no mines being worked in the State. Perhaps this is the only part of this republic of which the same can be said

CHIHUAHUA.—Two mountains are said to have been discovered near Batopilas, containing some quartz veins where the barren mineral is held together by strings and wires of gold. Some prominent parties in Mexico are interested in the find, which is hoped will be equal to the famous bonanza of Guadelupe y Calvo, in the same range, where some tons of quartz were extracted that are said to have yielded 50 per cent of gold.

Coal has been discovered 45 miles west of Chihuahua city on the Chavez hacienda.

The Aguilereña mine at Parral, owned by the Hidalgo Mining Company, of Pittsburg, Pa., has been producing 50 tons of ore daily for several months past. The ore is worked in a new lixiviation plant which is said to be very economical.

About 30 tons of smelting ore are shipped daily from Parral by the Jesus Maria mine, owned by the heirs of N. A. Cowdrey, of New York.

In the Santa Barbara district the Santa Barbara Mining Company, of London, owns the San Francisco del Oro mine, also a stamp-mill. The latter is at present idle, pending the arrival of a corps of experts from Germany, who are to show how to work the extremely rebellious ore found in the mine.

COAHUILA.—In recent notices in the American papers about the shipment of an iron plant to Sabinas, I see that this place is described as being midway between El Paso and Eagle Pass. It is, in fact, a station on the International R. R., several hundred miles from El Paso, and only 116 miles from Eagle Pass. There are coal-fields and iron mines in the vicinity, but the attempt to make iron in Mexico is more likely to be a failure under present circumstances than any other enterprise that can be here engaged in. The home market is limited and slow, and the competition from both America and Europe is very great. The advantage of a high protective tariff is more than counterbalanced by the labor difficulty that will have to be met if Mexican labor is employed. Then, too, skilled iron makers from other countries are not likely to stay long in a country where the thermometer is among the hundreds for several months of every year, and where life is rendered a burden by the absence of most things that are necessary to comfort of the crudest kind.

NUEVO LEON.—The Rosario mine at Salinas Victoria is now exporting a fair quantity of ore. This mine was very extensively worked in the beginning of the Spanish Conquest, but was neglected for many years before the present company, of Texans and Mexicans, took hold of it. The Vallecillo mines, to east of Villaldama station on the Mexican National R.R., have given up smelting, and are exporting all their ore to Swansea. These mines are owned in New York.

DURANGO.—Haggin and Tevis, of San Francisco, have purchased the Chechemoli mine in the district of Guanaveci.

Mining concessions have been made by the government as follows: In the Guanaveci district, to Juan McDonald and Manuel Iturbe; in the mineral district of El Oro, to Joaquin Davalos; in the district of Pueblo Nuevo, to Farnando Pimentel y Fagoaga; in the district of Inde, to Atanasio Pinera.

SAN LUIS POTOSI.—The Concepcion mine in Catorce has struck a rich bonanza within a week or two. The mining expert of the St. Louis *Globe-Democrat* says that the new discovery is a vein 328 feet thick, of ruby silver. Without going to that extreme, I am informed that it is a very tidy discovery, and that the result will be a very fat lot of dividends for the shareholders. This is the mine that was to have been sold to a foreign company some years ago for $7,500,000. The very patriotic newspapers in this city heard of the matter, and made so great a noise about such a rich mine going into the hands of foreigners that the deal was declared off. The mine has a fine hoisting and pumping plant, recently put in by a San Francisco firm, and employs about 600 men.

The San Augustin mine, also in Catorce, paid a dividend last July for the first time in some years. D. Ignacio Cornejo, one of the best Mexican mining engineers in the Republic, has been in charge of this property for a long time.

The old Padre Flores mine in Catorce has been yielding well lately. This mine was opened by the priest from whom it takes its name in the year 1778, and in the three years next following the poor priest took out of the mine (for which he had paid $800) a sum of between six and seven millions of dollars. The ore is in rich pockets, which are found, I am told, by chance, as the connection between them has never been studied out.

From Matehuala, Mr. David Coghlan, who has been connected with the mines of this (the Catorce) district ever since the fifties, and who is the author of a very careful map of the district, has retired with his family to England. His place at the La Paz mine has been taken by a very intelligent Mexican engineer, D. Santiago Silva.

In the Santa Fe mine, near Matehuala, a vein has been cut over 3 feet wide, carrying chlorides and bromides worth about $300 per ton.

The ores from the San Silvestre and Los Santos Reyes mines, which are rich in lead, have been sold under a contract to an American company.

JALISCO.—From London I am advised that a company has been formed to work the La Luz mines near Hostotipaquillo in this State. I hope that this company will do better in the future than it has in its present infancy. They have sent out to one of the roughest and wildest parts of Mexico, where, if anywhere, a strong man used to hardships is required, an old gentleman who is barely able to keep his legs on a smooth pavement, who cannot speak a word of Spanish, and who is as innocent as a child in all that he ought to know to carry on such an enterprise to a successful conclusion. This gentleman came to Guadalajara to receive possession, without a scrap of paper in the way of legal credentials, and, to crown all, the company dishonored the very first draft that he drew (for 500 pounds), and he was, at latest advices, dependent on the kindness of friends in Guadalajara. Who can wonder that the Mexicans distrust foreigners with such examples before them?

ZACATECAS.—Three hoisting plants are being put up by a San Francisco firm at Ramos. A company is being formed in Texas to work the La Restauracion mine in the extreme eastern part of this State, near the Mexican National Railroad. Another company is being formed to work the Marsellesa mine in the city of Zacatecas. The San Jose Mexican Mining and Smelting Company is a Cincinnati company which is working a mine in the Pinos District. The last advices from there say that the mine is looking well. Only development work is being done.

GUANAJUATO.—The total product of gold and silver bullion of this State during the fiscal year ending with last June is officially stated to have been $5,467,852, being $545,400 greater than it was last year.

MICHAOCAN.—It is officially stated that there are twenty mines open to denouncement in the district of Tlalpujahua. One of the mines is of lead, eight are of opals and one of cinnabar. The rest are of silver and gold.

A fine lead smelting plant by Hendrie & Bolthoff, of Denver, has recently been put up in Otzumatlan to work the ores from a mine owned by a prominent gentleman of this city.

A party of gentlemen from Kansas City recently visited Tlalpujahua, it is supposed with the view of purchasing the famous Borda mine in that place.

MEXICO.—The work in the mill belonging to the El Oro Mining Company has been partially suspended, owing to the breaking of a shaft.

ORIZABA.—An Anglo-Mexican company has been formed to work the rich marble quarries of this State.

CITY OF MEXICO.—Mr. Luis Parres has applied for a patent on a new process for beneficiating ores. Dr. Casteneda has applied for a patent on a new method of dissolving all kinds of fats, caoutchouc, gutta percha and many other gums and resins. Messrs. Ignacio Ibarguengoit and M. Pesquera have applied for a patent for a method of separating silver and gold from the other metals by means of electricity.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Sept. 7.

Statistics.

Production Anthracite Coal for week ended September 1st and year from January 1st:

TONS OF 2240 LBS.	1888. Week.	1888. Year.	1887. Year.
P. & Read. RR. Co..	190,000	4,128,123	4,711,274
Cent. R. R. of N. J.	150,855	3,561,293	3,318,236
L. V. RR. Co.	147,701	4,161,070	4,289,854
D., L. & W. RR. Co.	144,465	4,263,448	3,548,786
D. & H. Canal Co..	107,568	2,854,208	2,429 872
Penna. RR.	67,635	2,905,207	2,437,481
Penna. Coal Co.	41,218	1,103,565	963,320
N. Y., L. E. & W.	19,000	604,491	514,905
Total	863,442	23,581,605	22,213,731
Increase		1,367,874	

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

Production for corresponding period:

1883	21,101,449	1885	19,032 929
1884	19.745,698	1886	19,968,978

Production Bituminous Coal for week ended September 1st, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2240 lbs.	1888. Week.	1888. Year.	1887. Year.
Phila. & Erie RR.	2,456	42,042	10,875
Cumberland, Md.	76,778	2,341,339	2,070,441
Barclay, Pa.	3,000	117,663	125,817
Broad Top, Pa.	6,000	230,790	211.611
Clearfield, Pa.	68,875	2,237,475	2,117,245
Alleghany, Pa.	12,505	516,187	585,761
Pocahontas Flat Top	25,000	934,588	679,872
Kanawha, W. Va.	30,000	1,201,724	1,004,593
Total	224,614	8,621,818	6,804,125

WESTERN SHIPMENTS.

Pittsburg, Pa.	14,300	474,674	380,529
Westmoreland, Pa.	19,042	1,016,350	905,043
Monongahela, Pa.	10,163	260,697	249,622
Total	43,505	1,751,721	1,535,194
Grand total	268,119	9,373,539	8,339,319

Production of Coke on line of Pennsylvania RR for week ending September 1st, and year from January 1st, in tons of 2000 pounds: Week, 86,624 tons; year, 2,574,830 tons; to corresponding date in 1887, 2,252,848 tons

Anthracite.

The coal trade continues remarkably active, though, of course, the demand is less pressing than it was before the advance in prices on the first of the month. Some of the companies report having sold scarcely any coal at the new prices, while others claim to have disposed of all they can take orders for, at least of stove and chestnut sizes. Broken is showing greater weakness. Egg is in fair demand. There is still some coal to be delivered at the old prices, but nearly all the orders that are now taken are at the new rates. The fine sizes continue to be a drug, and a fair quotation for Pea coal would be from $2 to $2.25, and for Buckwheat, $1.60 to $1.70. These prices, of course, are unremunerative, but there seems to be no lack of supply.

We continue our quotations of last week, and we make comparison with the prices ruling at the corresponding time last year:

	September. 1887.	September. 1888.	Increase. this year.
Broken	$3.50	$3.95	$0.45
Egg	3.70	4.30	0.60
Stove	4.10	4.65	0.55
Chestnut	3.85	4.65	0.80

The members of the association of retail coal dealers will meet to-night in the Grand Opera House building to order a further advance in the price of coal. It is the intention to charge 25 cents a ton more than the rate fixed a few days ago. This will make an advance of 50 cents over the retail price before the advance by the wholesale dealers.

Bituminous.

The trade is stronger and the shading that was so common early in the season is now scarcely ever heard of. In fact, we believe that all the producers are getting full prices and some are getting even a little more than the circular rates. It would be strange if the bituminous trade should not reflect some of the activity and advance in price which has come to the anthracite trade, and which has brought with it so great prosperity.

The expectation is that from this on the bituminous trade will continue to improve, and it would not surprise us if somewhat better prices were obtained later in the season.

We continue to quote $2 60 f.o.b. Baltimore and Georgetown, and $3.25 for New York.

There is a rumor that negotiations are going on with the view of selling the Flat-Top Trust lands to an English syndicate.

Boston.

Sept. 6.

[From our Special Correspondent.]

The anthracite coal movement at this port might be larger and better, but their is no complaint. Dealers have bought as liberally as they could be expected to do with coal so short in first hands. Then they desire to see whether orders taken in August, and unfilled during that month, will be cancelled or not, and another week will tell this part of the story. There has been more talk of cancellation than usual. The September advance comes as was expected, but there is a disposition to test it pretty thoroughly and see if the old time "fifteen cents" will not be obtained. So the market is in a kind of waiting attitude just at present, and its drift will be more noticeable next week.

The best supply seems to be of broken, upon which only ten cents advance was made. Pea coal is also in pretty fair supply, and large lots for mill purposes could probably be had at quite a low price. There is no pea and dust to speak of and no quotable price. That would depend upon supply of the company or individual operator.

In bituminous coal there is, and has been, a fair summer trade. Quotations rule as low as at any time; how low that is can only be found out by the shrewd buyer after a careful canvass of the market. We quote nominally $3.35@$3.50, delivered.

Vessels are still scarce, and it appears to be the unquestioned fact that lumber and other freight are competing more than for some time for the colliers. There is considerable variation in quotations. Bituminous coal shippers are getting lower freights.

We quote vessel rates, exclusive of discharging: New York, 80@85c.; Philadelphia, 90c.@$1; Baltimore, $1@$1.05; Newport News and Norfolk, 90c.@$1; Richmond, $1.15@$1.25; Provincial, $1.60@$1.75.

Retail trade is fairly good. The combination works well at present, and prices are well maintained.

Buffalo.

Sept. 6.

[From our Special Correspondent.]

The demand for anthracite coal continues quite brisk and decidedly phenomenal. The history of the trade records nothing like the present condition of affairs. Of course, producers and dealers are in high feather, and feel very good under the prevailing circumstances. The query now propounded is, "How long will this state of prosperity last?" Supply continues inadequate for demand.

Bituminous coal is also in good request, and the market is firm, with slightly advanced quotations. Consumption increases rapidly, and no bounds can be placed as a point of stoppage.

The knowing ones say that the Dominion of Canada will require considerably more coal this winter than last or previous ones, as the number of consumers is increasing at a rapid ratio. They look for a large trade and plenty of orders for winter.

Complaints exist on account of the short supply of cars, but this trouble is expected to be remedied shortly.

Coke quiet, and without any features worth recording.

Lake freights quiet and unchanged. Nothing special to report, excepting that coal was a trifle more plentiful, yet boats continue to leave daily without any cargoes.

The shipments by lake westward from August 30th to September 5th, both days inclusive, were 77,000 net tons, viz.: 33,600 to Chicago. 11,060 to Milwaukee, 12,000 to Duluth, 4200 to Superior, 3070 to Toledo, 3200 to Detroit, 650 to Sheboygan, 500 to Sandusky, 3770 to Marquette, 520 to Muskegon, 480 to Cleveland, 1550 to Sault Ste. Marie, 620 to Racine, 30 to Chippewa, 1590 to Gladstone, 130 to Bay City, and 250 to Saginaw. Total shipments thus far this season, 1,564,740 net tons, including cargoes on vessels from Tonawanda not reported at the Custom House at this port.

The rates of freight were as follows: 75c. to Chicago, Sault Ste. Marie, Marinette and Portage; 70c. to Sheboygan, Milwaukee and Marquette, 80c. to Racine; 60c. to Duluth and Superior; 30c. to Cleveland and Sandusky; 35c. to Detroit and Toledo; 85c. to Muskegon; 75c. to Gladstone; 40c. to Bay City, and 50c. to Saginaw.

The shipments by canal for the fourth week of August, 238 net tons; the receipts, 3019 net tons.

Mr. Eric L. Hedstrom has written an exhaustive article on the coal trade of Buffalo, past and present, which is published with illustrations in the International Fair special.

Mr. Horace A. Noble was elected a Trustee of the Merchants' Exchange Gratuity Fund last Tuesday.

Statistical: Receipts of coal by lake at this port this year, none. Shipments westward by lake for month of August, 347,360 net tons, as compared with 246,050 tons in 1887, and 189,990 tons in 1886. For the season to September 1st, 1,507,190 net tons, 1,083,570 tons in 1887, and 910,070 tons in 1886. The receipts of coal by canal for August, 28,041 net tons, as compared with 7442 tons in 1887; the shipments 883 tons, as compared with 1599 tons in 1887. For the season receipts, 75,733 net tons, as compared with 26,224 tons in 1887 and 46,245 tons in 1886; the shipments, 4961 net tons, as compared with 5308 tons in 1887, and 11,115 tons in 1886. Railroad receipts and shipments not reported.

This year the closing rate of lake freight on coal hence to Chicago, 75c.; in 1887, $1.15; and in 1886, 75c.

The distribution of coal from this port by lake since the opening of navigation to September 1st was as follows to the points named:

	Net tons		Net tons
Chicago	523,749	Cleveland	550
Milwaukee	349,417	Detroit	15,890
Duluth	169,280	Romney	250
Sandusky	5,680	Sault Ste. Marie	800
Racine	19,210	Sheboygan	9,890
Toledo	46,427	Kenosha	4,170
Bay City	7,840	Pt. Arthur	900
Wallaceburg	280	Wasaburne	25,420
St. Clair	1,000	Ludington	1,530
Marinette	3,130	Gladstone	14,800
Tawas	250	Houghton	630
Chebovgan	1,040	Lake Linden	5,110
Kelly Island	870	Ashland	23,800
Ft. William	1,100	Green Bay	21,750
Portage	550	Saginaw	12,840
P. Clinton	970	Superior	75,800
Kincardine	3,290	Put in Bay	350
Port Huron	3,490	Menominee	2,640
Kenosha	620	Manistee	600
Muskegon	950	Escanaba	1,050
Marquette	10,150	Marine City	1,700
Pt. Dover	55	Hancock	1,570
Manitowoc	8,230	Vessels from Tonawanda to ports not named above	150,000
Alpena	800		
Pt. Colborne	650		
Windsor	1,960		

Pittsburg.

Sept. 6.

[From our Special Correspondent.]

Coal.—Market firm, with an upward tendency and an increased demand. This, however, is generally the situation on the approach of cold weather. Besides, those that don't use natural gas are now engaged in laying in their winter supply. Prices have advanced in most of the Western and Southern markets. The river rose on Sunday sufficiently to float barges. There was no coal loaded, the only departure being the "Nellie Speer" for Cincinnati, with 75,000 bushels. The coal men and miners are still apart in their views. There is no mining in the pools worthy of mention.

PRICE OF COAL PER 100 BUSHELS = 7600 LBS.

First pool	$4.75	Fourth pool	$3.25
Second pool	4.25	Railroad coal	5.00
Third pool	3.75		

Connellsville Coke.—The demand is increasing, in some instances it exceeds the supply. H. C. Frick Coke Company advanced wages five cents per ton voluntarily. When all the furnaces are in full operation the demand for coke will be materially increased.

The new rates are: Blast Furnace, $1.25 per ton; to dealers, $1.35; Foundries, $1.40.

Freight rates to Pittsburg, 70c. per ton; to the Mahanov and Shenango valleys, $1.35; East St. Louis, $3.20; to Cleveland, $2.80; to Chicago, $2.75; to all other points the same proportions.

St. Louis.

The Consolidated Coal Company, of St. Louis, controlling the majority of the bituminous coal mines within a radius of fifty miles of the city and even greater distances, on September 1st advanced the price of coal ½ cent on standard grade, and 1 cent on higher grades. The Coal Exchange met on the 3d inst. and made a similar advance, one month earlier than is customary. It is understood that the regular winter advance of 1 cent will be added on October 1st. The Bryden Coal and Coke Company, the only independent concern of any importance in the St. Louis coal trade, will also make a like advance. It is stated that the advance is due to the request of the miners for an increase of wages, and that their request will be granted.

FREIGHTS.

Southern Pig-Iron Rates.—The Queen & Crescent Route, via the Alabama Great Southern and the Cincinnati Southern railways, has issued a supplement to tariff No. 7, giving new rates on pig-iron to Burlington and Davenport, Iowa, and Moline and Rock Island, Ill. The rate to these points from Chattanooga, Rising Fawn, Florence, and Sheffield is $4.75. From Dayton and Rockwood it is $4.55. The rate from Atalla, Bessemer, Birmingham, Gadsden, and Wheeling, Ala., to Burlington, Iowa, is $5, and to Davenport, Moline, and Rock Island, Ill., $5.02.

The latest actual charters to September 7th, per ton of 2240 lbs.

From New York to:—Beverly, .80@90*; Boston, .80*; Bridgeport, Conn., .65@ 70; Cambridge, Mass., .80*3c; Cambridgeport, .80*3c.; Chelsea, .80*; Com. Pt., Mass., .80*; E. Boston, .80*; E. Cambridge, .80*3c.; E. Greenwich, R. I., .80; Fall River, .80; New Bedford, .85@.90; Newburyport, .95*; New Haven, .65@.70; Newport, .80; New London, .70@75; Norwalk, Conn., .55@.60; Norwich, .80; Portland, .80*; Portsmouth, N. H., .90*; Providence, .80; Quincy Point, .90*; Salem, .80*.

From Philadelphia to:—Annapolis, .70; Bangor, .95*; Bath, Me., .95*; Boston, .90@.95*; Cambridgeport, 1.25*; Charleston, 1.00; Chelsea, .95; Com. Point, Mass., .95*; East Cambridge, 1.17½*; Fall River, .80@.90*; Gardner, Me., 1.00*‡; Gloucester, 1.05@1.17*; Lynn, 1.10@1.30*; Marblehead, 1.05*; Medford, 1.10*; New Bedford, .80@.90*; Newburyport, 1.15*; Newberne, .80@.85; New York, .90*; Norfolk, .70; Portland, .90@.95*; Portsmouth, N.H., 1.00*; Providence, .80@.90*; Richmond, Va., .75; Rockport, 1.22½*; Saco, Me., 1.20*; Salem, Mass., .90*; Savannah, 1.10; Washington, .85; Weymouth, 1.15*; Wilmington, N. C., .60.

From Baltimore to:—Bangor, Me., 1.05; Bath, 1.05; Boston, 1.05; Bridgeport, Conn., .90@.95; Brooklyn, .90; Charleston, 1.10; Fall River, .95; Galveston, 3.00; Gardner, Me., 1.00@1.10; New Bedford, .90; Newburyport, 1.30; New Haven, .90; New London, .90; New York, .90; Portland, 1.05; Portsmouth, N. H., 1.05@1.10; Providence, .90; Quincy Point, 1.10; Richmond, Va., 70; Salem, Mass., 1.10; Savannah, 1.25@1.50; Somerset, .90; Williamsburgh, N. Y., .90; Wilmington, 1.00.

* And discharging. 3c. per bridge extra. † Alongside. ‡ And towing.

MARKETS.

NEW YORK, Friday Evening, Sept. 7.

Prices of Silver per ounce troy.

Sept	Sterling exchange	Lond'n Pence.	N. Y. Cents	Sep.	Sterling exchange	Lond'n Pence.	N. Y. Cts.
1	4.87⅛	42 1 16	91¾	5	4.87¾	42⅛	†
3	*	*	*	6	.....	42 3-16	‡
4	4.87⅛	42⅛	91⅞	7	.....	42 3-16	92⅛

* Holiday. † 91 15-16. ‡ 92 1-16.

Silver market strong and active.

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, made no change in its rate for discount and it remains at 3 per cent. During the week the bank gained £71,000 bullion, and the proportion of its reserve to its liabilities was raised from 44·17 to 44·55 per cent, against an advance from 42·19 to 43·21 per cent in the same week of last year, when its rate for discount was 4 per cent. Thursday the bank gained £60,000 bullion on balance. The weekly statement of the Bank of France shows a loss of 5,125,000 francs gold and of 275,000 francs silver.

Copper.—This market continues to display a remarkable amount of strength, and the prospect of a relapse in the present range of quotations becomes more distant as time advances. There cannot now be any doubt, even with the most skeptical, that the powerful French syndicate is in absolute control of almost the entire stock and future production for some time to come, and during that period the market quotations can be regulated very much as they may direct. The amount of business transacted on the Metal Exchange is comparatively small, as outsiders have hardly any metal to offer, and, as lately reported, the few imprudent bears have been compelled to buy back from the syndicate to cover their short sales. To-day's closing quotations for Lake copper are: Spot, 17c.; September, 17c.; October, 17c.; November, 16·90c.; December, 16·90c.

Mail advices just received from Europe are much more cheerful than for a long time past, and it seems that if not a very large, at any rate a regular amount of business is now being done with consumers, and the smelters have been compelled to come into the market for their supply of furnace material, and orders for such material have lately been placed pretty freely. Sales are reported of 600 tons Anaconda matte at 15s., Seville precipitate at 14s. 9d. and best precipitate at 15s. 3d. per unit, in addition to which several parcels of ore have been disposed of at full prices. A good business is also doing in Best Selected Copper at about £79 and in Tough Cakes at £77 10s. to £78, the quantities offering being comparatively small. The squeeze in Chili Bars continues, and cable advices at hand to-day report business done at £99 15s. This great rise is almost, if not entirely, due to the covering operations of bears, who have become exceedingly nervous. Private reports state that these unfortunate bears are outsiders, not connected with the Metal Exchange, it having been quite evident to the traders that such operations were more than absurd under present conditions. The total quantity of Chili bars which have now been shipped to Havre amounts to 15,400 tons, in addition to 4000 to Rouen and Dunkirk. According to the latest cable advices Chili Bars close to-day at £99 15s.@£100, and G. M. B. copper at £76 15s.@£77 5s.

Rumors have lately been in circulation that an extended arrangement between the syndicate and the copper producers had been made to cover a period of about nine years, by which the syndicate guarantee a certain fixed price for the copper, but have the right, in case they deem it desirable, to call on the producers to reduce their output to the extent of 20 to 25 per cent. We are informed, however, in authoritative quarters, that the rumor is quite unfounded. The impression is felt that it has simply been set afloat with the object of influencing the prices of the copper companies' shares in the market, more particularly in Boston.

Tin.—With a moderate amount of business transacted during the past week, the tone of this market has continued very steady and no further rise in quotations has taken place. Our closing prices to-day are Spot, 22·75; September, 22·75; October, 22·75. The London market has also improved, and last cable prices are spot, £99 15s.@£100; 3 months forward, £100@£100 5s.

Lead.—This market is decidedly strong in tone, and bull operators continue their purchases with wonderful spirit, and have succeeded in bringing about another important advance. Although consumers still hold back it really looks as if the advance in prices was not yet exhausted, and the offerings from producers are not now so numerous as previously, the smelters having sold a good deal of lead ahead, and some of them evidently having contracted for their bullion on the basis of the market price of lead (*i. e.*, under a "rolling" and not a "flat" contract) are likely to come out considerable losers under such contracts in the event of lead rising much higher. Our closing quotations to-day are: Spot, 5c.; Sept., 5c.; Oct., 5c.; Nov., 4·95; Dec., 4·90.

A sharp rise has also taken place in London during the week, and Spanish soft pig lead is now quoted there at £14 2s. 6d., which is the equivalent of about 3·17½ per lb., without commission or duty, if imported into this country.

There are rumors to-day, which, though bearing the stamp of probability, we have been unable to confirm absolutely, that 2000 tons of foreign lead have been contracted for by consumers here. If this be a fact, it is probably only as a protection against accidents, and it will scarcely come over.

Messrs. John Wahl & Co., of St. Louis, telegraph to-day as follows:

Market during the past week has been almost entirely speculative. Sales for the week amount to 1000 tons for present and future month, the larger portion going to speculators.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows: Our market has advanced slowly since our last report; 4·75c. is now the asking price, 4·70c. bid by speculators. There is but little doing and demand is from hand to mouth only. Sales for the week amount to about 100 tons spot to consumers at 4·65@4·70c.

Spelter.—No movement of importance has taken place in this article during the week, and quotations remain at 4·85@4·90.

Antimony is still quiet, at Hallett's 9⅝; and Cookson's, 12⅛@12¾.

Chemicals.—The week under review has been quiet in nearly all lines of the trade. While the market presents few features of importance, the volume of business is of fair proportions and prices for the most part are well sustained. There are, of course, endless prophecies, disinterested and otherwise, floating around among dealers; but they are, at the best, mere speculation. At the present writing there seems to be little reason to look for an important change in prices for some time to come, unless unexpected contingencies occur.

It may be seen by the following report of Messrs. S. W. Royce & Co., of Manchester, dated August 25th, that our market is a reflection of the condition of the trade abroad:

"The tendency in the chemical trade appears to be toward improvement. Shipping business is brisk, and matters are better in some branches of the home trade, and the Board of Trade returns continue to show this year to be considerably better than last. Those inter-

ested in matters chemical are, however, slow to believe in any reported improvement, the wish in that direction having so often proved father to the thought. In the alkali branch a steady trade continues to be done, the demand on both home and export account for bleaching powder and all descriptions of soda being very satisfactory. Some business has been done in bleaching powder for next year, but only to a moderate extent, and makers are anything but agreed in their ideas of price. Chlorate of potash, in consequence of a reported arrangement amongst manufacturers, is inquired after, especially for forward delivery, but sellers forward are difficult to find. Sulphate of copper is much improved, and moves off freely at advancing prices. In acetate of lime there is nothing new to report; prices continue to droop—the fall during the eight months of this year being some 30 per cent—and business in acetic acid and liquors is in a wretched state. Carbolic acid remains very quiet, and under ordinary circumstances any early improvement can scarcely be reasonably expected. Sulphate of ammonia is also dull and prices drooping, though no large quantities are offering. Lead salts are steady as to price, but slow of sale. Prussiate of potash is in better demand. Arsenic steady."

In heavy chemicals on this side, trade is very fair. Naturally, with the first week of Autumn, the demand for immediate consumption is brisk.

Carbonated soda ash, 48 per cent, shows sales largely of a jobbing character at last week's prices. It is expected that the glass manufacturers will start up before October 8th, the date recently agreed upon. This, however, may not materially affect prices, as some consumers have carried stocks from last Spring and buy now only in small lots to meet current requirements. We continue to quote 1·25@1·35c., according to quantity and date of delivery.

Caustic soda ash, 48 per cent, shows little animation. A small business has been done at unchanged prices. The market may be written 1·20@1·25 for future delivery, according to quantity and date of shipment, and 1·25@1·30 for stock on the spot.

Caustic soda is in better demand and prices are firm. We record an advance on last week's figures and quote for 60 per cent 2·32½@2 37½c., and for high test, 70@74 per cent, 2·17½@2·25c.

Sal soda is in fair demand. We continue to quote ruling prices at ·95@1c. for stock on the spot, and ·92½@ 95c. to arrive.

Hypo ulphite of soda is sold at 1·55@1·70c., according to quantity and package.

Bleaching powder is sold in moderate quantities. In the New York market, prices for stock ex store remain at 1·87½@1·92½c. There is a disposition to shade prices for future delivery, and quotations are nominally 1·90@1·95c., according to quantity.

In the acid market, business, although quiet, is reported as better than last week. Trade, however, is confined to small lots, and few, if any, contracts for future delivery are being made.

Acetic acid is sold light at 2¼@2½c., according to quality and brand.

Muriatic acid is dull at unchanged prices, as follows: 18 degrees, 1·15@1·20c.; 20 degrees, 1·30@ 1·50c.; and 22 degrees, 1·40@1·80c.

Nitric acid is featureless and prices are unchanged.

Oxalic acid is firmer in price than at our last writing. The demand continues good, and prices are 6½ @8c.

Tartaric acid is without particular animation. The following are our quotations: For crystals, in lots of 3000 lbs. or more, 43c. per lb.; smaller quantities in barrels, 44c. per lb.; 50-lb. lots in boxes, 45c. per lb., and one cent advance on these figures for powdered.

Sulphuric acid shows jobbing sales at unchanged prices.

We quote for 66°, 90@95c. per cwt. for large lots, and $1@$1.10 for smaller quantities.

Brimstone is very firm at last week's prices. As we have stated, freight charges continue high, and in some instances advance. We quote for best unmixed seconds on the spot $21; to arrive, $20 50; thirds, to arrive, $19.50. There is little business being done ex store.

Nitrate of soda continues firm and the advance in prices recorded last week is well sustained. The market rules at 2·12½@2·20c. for stock on the spot, and 2·05 @2·20c. to arrive, according to quantity and date of shipment.

The fertilizing chemical market is quiet at the present writing.

The following are the ruling quotations: Dried blood (city), low grade, 2·30@2·35 per unit. Western, high grade, 2·35@2·40 per unit for ground material; tankage, high grade, $23@$24 per ton; low grade, $21@$22 per ton. Fish scrap, $24@$25 per ton f.o.b. factory. Sulphate of ammonia, $3.15@$3.20 per cwt. Steamed bones, $20 per ton.

Charleston rock, undried, $5 per ton; kiln dried, $6 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, is held at $9.50@$9.75 ex steamer at New York.

Refuse bone-black is quoted at $17½@$18 per ton. Dissolved bone-black is 90c.@$1 per unit for available phosphoric acid, and acid phosphate 75@80 per unit for available phosphoric acid.

Double manure salt is sold in moderate quantities. Prices rule at about 1·05c. on a basis of 48 per cent potash.

Muriate of potash is without particular animation. Prices remain at $1.80 for both spot and arrivals.

High-grade sulphate of potash is slightly weaker in price, which rules at 2·15@2·20c. on a basis of 90 per cent.

Kainit continues in good demand. The supply, owing to the scarcity of freight room, fails to satisfy current requirements of consumers, and prices are consequently very firmly maintained. We quote for stock in store, nominally, $10.25 per ton, and to arrive, $9.50@$9.75, according to date of shipment.

Cream tartar is in small demand. For "prompt cash" 1c. discount is now allowed.

Blue Vitriol—There has been some inquiry for this article. Stocks available are limited and prices are firmly maintained.

Acetate of lime is sold lightly at unchanged figures.

Building Materials.—This has been an "off" year in the building trade, and New York has failed to keep pace with the other large cities of the country in the amount of building done. The decrease is variously estimated to be from twenty-five to fifty per cent from last year. Consequently, trade in nearly all lines of building materials has been dull and prices have ruled generally lower than at any time in the last three years.

Bricks.—In the brick trade this depression is particularly felt. The production has been fully equal to that of preceding years, while the consumption is estimated to have fallen off thirty per cent.

During the past week, there has been a fair demand for current requirements, but as it has always been equaled by the supply, prices have not been benefited. It is asserted that as soon as the storage sheds are full, production will be decreased, if not entirely stopped, until better prices can be obtained, which means when the supply is more nearly equal to the demand.

Cement.—As the use of this article is very general, the depression in the city building trade does not materially affect the market. The demand is reported steady and fair, and prices are well sustained. The consumptive demand for imported brands is reported especially good.

Lime.—This market is devoid of interesting feature. There is a considerable over supply, which is but slowly drawn upon to meet current requirements.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Sept. 7.

American Pig Iron.—There is no change of importance in the condition of the pig-iron market. Business continues in a moderate way, although it cannot be said that there is any pressure to buy. There is no very large amount of No. 1 iron offered for sale, although buyers can generally get about what they want for reasonably prompt delivery. There are some good inquiries for late delivery, and even for next year's delivery. Mr. B. G. Clarke, President of the Thomas Iron Company, states that their sales have been much lighter than last year, and that they have a larger amount of stock on hand than for many years, although there is no accumulation of unsold iron. Prices continue very firm, and buyers have reached the conclusion that no concessions may be expected from current rates. The condition of the market is in seller's favor, and a stimulated demand would be likely to lead to a slight advance in prices, although strong makers and dealers would not favor such an advance at present. We note another sale of 1000 tons Gray Forge at $15 at furnaces.

Scotch Pig has again advanced in Glasgow, prices of some brands being 8d.@1s. higher than a week ago. Prices on this side respond only feebly to the Glasgow advances. In fact, there are only a very few brands that could be sold here for the price of importation. For instance, Coltness iron, lots of which can now be bought for $20.50@$21.00, could not be imported for much less than $22.-25. The willingness of holders of Scotch irons to sell their stocks below the price of importation may be taken as an index of a declining demand. Foundrymen are getting more and more into the way of "softening" their mixtures with "American-Scotch" irons, made chiefly in Ohio and Tennessee, which can be bought at lower rates than the Scotch brands.

Bessemer Pig shows no life, and quotations are purely nominal.

Steel Rails are in a little better demand, and Eastern mills are more firm in their prices. The only sale reported this week is of a lot of over 10,000 tons sold by an Eastern mill to a Southern road on private terms, but at no concession from current quotations. Some rather large orders are in negotiation in the West, and an order for about 8000 tons will probably soon be closed by an Eastern road.

The demand for *Structural Iron* is rather light, although a very fair business is doing in beams and channels for building purposes. There is one large bridge order on the market, the contracts for which will very soon be awarded.

Steel and *Iron Plates* and *Bar Iron* are moderately active, with the market in buyers' favor. As we pointed out last week, those mills which are well located and have built up a good reputation for their products are well employed. Other mills show a little slackness and desire for orders.

Wrought-Iron Pipe is firmer, discounts being a little less than two weeks ago.

Rail Fastenings are likewise firmer, being in little demand.

Scrap Iron is very dull, but little business being reported. Stocks are pretty light.

Old Rails are in about the same condition as reported last week, with even more firmness on the part of strong holders. A lot of 200 tons tees was sold at $22, and a small odd lot of double heads at about the same price. But these sales do not represent the market, which is very firm at $23@24 for tees. These prices are above buyers' views, and there is consequently no business of importance to note. Tees for shipment cannot be quoted below $24. In fact the price at which any quantity of old rails could be bought to-day is within a few dollars of the price of new steel rails.

Louisville. Sept. 4.

(Specially reported by Messrs. HALL BROTHERS & Co.)

The month just past closed with an exceedingly satisfactory business, the volume aggregating many thousand tons, and much larger than with reason could have been expected. Sales have been made in all directions for most all kinds of work, which is a good indication that the business of the average consumer is in a healthy condition. A much larger business could have been done had the furnaces been able to meet the requirements of a large portion of the buyers who wanted early shipments. The market has been firm, prices having been fully maintained, with a disposition on the part of some furnaces to advance still further. Deliveries have been mainly through this year, although there have been some sales made for shipments extending into 1889.

Our quotations for cash f.o.b. Louisville will be found in our weekly register of prices.

Pittsburg. Sept 6.

[From our Special Correspondent.]

Raw Iron.—The market for most descriptions continues firm, with a steady demand; in many cases the demand exceeds the supply, causing a number of round lots to be booked for future delivery. Gray mill iron was much inquired for, prices not so much an object as to obtain the material. To-day's reports show a liberal amount of transactions; advance about fifty cents per ton. Bessemer sold above last week's prices, sales extending for some time; the fact is buyers have to wait their turn, as most of the furnaces now running have contracts extending to the end of the year. Several furnaces that have been out of blast are now preparing to resume. The general outlook is improving very materially, consumers are all busy, and in the aggregate are calling for a large amount of material.

There seems to be no anxiety about the future, and there is a feeling of confidence which could hardly be as general as it is without something to back it up.

The tone of the Eastern markets shows considerable change. The reports from Western Pennsylvania appear to have wakened them up. While they were talking about a dull market and no change in values, Pittsburg dealers have been going right ahead contracting for large blocks of Bessemer, gray forge, muck bar, blooms, billets, nail slabs; in fact, they seemed disposed to contract for anything in the shape of iron for present or future delivery. Pittsburg has a number of leading iron brokers, who have done their full share in making this city known as the first iron market in the country. We have the material and the men, and propose to let the balance of the world know something of what is going on in this hive of industry. The procession is moving, and those that don't catch on will be left.

Coal and Coke Smelted Lake Ore.

2000 Tons Bessemer	18.00 cash
1500 Tons Bessemer	18.00 cash.
1000 Tons Gray Mill	17.00 4mo.
1000 Tons Gray Mill	16 50 cash
1000 Tons Bessemer	18 00 cash
1000 Tons Gray Forge	16 25 cash
1000 Tons Gray Forge	16.50 cash
1000 Tons Gray Forge	16.50 cash
1000 Tons Bessemer, October	18.25 cash
1000 Tons Bessemer, October	18.25 cash
500 Tons Gray Forge	17.00 4mo
500 Tons Bessemer	17.75 cash
2000 Tons Gray Forge	15.75 cash
850 Tons Bessemer	18.00 cash
500 Tons Bessemer	17.75 cash

Coke, Native Ore.

500 Tons Gray Forge	15.75 cash.
500 Tons Gray Forge	16.50 cash.
300 Tons No. 3 Foundry	15.75 cash.
200 Tons No. 1 Foundry	17.50 cash.
200 Tons Gray Forge, C. S.	15.85 cash.
200 Tons No. 2 Foundry	16.50 cash.
50 Tons No. 2 Silvery	16.50 4 mo.
50 Tons Silvery, Extra	19.00 cash.

Charcoal.

100 Tons No. 2 Foundry	22 00 cash.
75 Tons No. 1 Foundry	23.75 cash.
50 Tons Cold Blast	26.00 cash.
50 Tons Cold Blast	27.00 cash.

Muck Bar.

2000 Tons Neutral	29 25 cash.
500 Tons Neutral	28.75 cash.
1000 Tons Neutral, October	29.50 cash.
1000 Tons Neutral, September and October	29.25 cash.
300 Tons Neutral	29.00 cash.

Steel Slabs and Billets.

1000 Tons Nail Slabs	29.25 cash.
1000 Tons Billets	29.50 cash.
1000 Tons Nail Slabs	29.00 cash.
500 Tons Nail Slabs	29.00 cash.

Steel Crop and Bloom Ends.

1000 Tons Bloom Ends	17.00 cash.
500 Tons Bloom Ends	19.25 cash.

Old Iron Rails.

500 Tons American Ts	25.25 cash.

Ferro Manganese.

100 Tons Ferro Manganese, 80 per cent	54.00 cash.

Scrap Material.

500 Tons No. 1 Wrought Scrap, net	20.50 cash.
350 Tons Steel Rail Ends, gross	18.50 cash
250 Tons Cast Scrap, gross	15 75 cash.
125 Tons Cast Scrap, gross	15.50 cash

Philadelphia. Sept. 8.

[From our Special Correspondent.]

A better feeling is reported for all branches of the iron trade. Prices have not varied so far as quotations are concerned for several weeks. Several offers by makers have been withdrawn. An advance of fifty cents per ton is spoken of as probable. Makers are waiting for the trade to place large orders for the fall and winter delivery. Heretofore pig iron companies have been indisposed to make contracts so far ahead. The current requirements are being filled every day, but for forge and foundry iron there are signs of an increasing production. Buyers have been making inquiries for standard brands but find it impossible to obtain concessions on the kinds of irons that they want most. Choice brands continue well sold up. Very little iron of any kind is offered. Nothing has been done in Southern as yet, although there are several inquiries out, but from present indications it is not likely that business will be closed, as the Western markets seem to be absorbing all that is made. Foreign iron is extremely dull; old quotations remain.

There is a good business in steel blooms and inquiries in the market to-day point to the closing of large contracts by Saturday. No sales of foreign slabs have been reported. Muck bars are moving along every day. Prices have advanced fifty cents and buyers are anxious to cover, but are unable to do so, excepting at the advance. A fair, steady demand for merchant bar is to be reported at nearly all mills. There is still some close cutting going on, which is interfering with a steady advance. A few inquiries are on the market to-day for large lots of merchant bars, but the buyers will not place them unless favored with exceptionally low quotations. After a long dullness, nails are on the up grade, though prices remain unchanged. Quite a number of large orders have been booked this week. Stores and buyers are satisfied that now is the time to cover, and are rushing in. Skelp iron has been quiet for a few days, but mill owners have knowledge of certain large requirements which they expect to capture in a few days.

The wrought-iron pipe mills are steadily increasing their orders and prices are firm. There is a particularly good demand for tubes. Orders are increasing at sheet-iron mills, but prices are by no means higher

The activity in merchant steel is less pronounced this week, though two or three manufacturers claim the situation is none the worse. Tool steel seems to be in active request. Other kinds are a little off. A few good orders for tank iron have just been booked and orders will be placed before Saturday for four or five hundred tons in all. Mill owners are still anxious for business and we can not chronicle any improvements till the mills are fuller.

Several inquiries have just been received from bridge builders for structural iron. It is quite probable, from what is said on both sides of the market, that the month of September will bring in a large amount of business in bridge iron. No one can tell, as no orders are coming in. Things stand about as they were, and predictions are of no account.

Old rails would sell if we had them, and the outside figure would be paid for early delivery lots. Importers are not able to promise specific deliveries. They predict that old rails will reach $23 within a month. All kinds of scrap are moving along freely, at full quotations.

FINANCIAL.

NEW YORK, Friday Evening, Sept. 7.

Considerable strength has been shown in the mining market during the past week, and the outlook for increased sales and higher prices is favorable. For months a "mining boom" has been predicted for this fall, and we hope that we may soon see it materialize.

We are informed by the counsel of the Tortilita Gold and Silver Mining Company that the complaint against Mr. James Gordon Bennett has been served in court, and the reply of his attorneys must be filed by the latter part of this month.

Horn Silver shows one sale of 300 shares on Thursday at 90 This is the highest quotation for some time past; it indicates that stockholders as a rule are exceedingly interested in the approaching election, and are not disposed to part with their stock at present. We are informed by Messrs. Whitlock and Simonds that proxies are coming in rapidly, and that they hope to make a very successful fight on behalf of the stockholders who desire the retirement of Francklyn and his followers. As both parties are making a persistent and energetic canvass for votes, it is probable that at the election this year a very large proportion of the stock of the company will be represented.

Ontario has again been active and advanced to $33.25.

The event of the week has been the advance in Brunswick, which went from 15 to 25c., some 15,700 shares changing hands. This stock has been neglected for a long time, and but two weeks ago was selling at 9c. There are various rumors in reference to this sudden advance, one of which is that a syndicate of Western capitalists, on the advice of an expert who recently reported ore in the mine, is buying largely. Reports from the mine received at this office are favorable, and an official telegram just received states that the mill started up on Thursday.

Only one sale of Plymouth is reported at $8 per share.

Quicksilver Preferred shows quite a large business,

IMPORTS AND EXPORTS OF METALS AT NEW YORK AUGUST 29 TO SEPTEMBER 1, AND FROM JAN. 1.

IMPORTS.

Spelter.	Week. Tons.	Year Tons.
American Metal Co., Lt.		275
Friedensville Zinc Co.		24
Hendricks & Bros.		56
H. Lamarche's Sons		6
Lewisohn Bros.		33
J. Macy's Sons		28
Naylor & Co.		131
Osgood, F.		83
Perkins, C. L.		725
Pope's Sons & Co.		28
Total		1,388
Corres. date 1887	34	2,949

Zinc Sheets.	Tons.	Tons.
G. A. & E. Meyer		1
H. Lemanche's Sons		594
Milne & Co.		1
Naylor & Co.		81
Total		677

Nickel.	Lbs.	Lbs.
McCoy & Sanders		164,436
Total		164,436

Antimony.	Casks.	Casks.
Total	35	2,191
Corres. date 1887.	55	2,678

Pig Lead.	Tons.	Tons.
Caswell, E. A.		46
N. Corwith & Co.		111
Hendricks Bros.		122
Total		279
Corres. date 1887	250	2,183

Tin.	Tons.	Tons.
Abbott & Co., Jere.		3,448
American Metal Co.	22	243
Birdwell & French		89
Crooke S. & R. Co.	78	237
Davol & Sons		8
Dickerson, Van Dusen		10
Fuoco, Edye & Co.		10
Hendricks Bros.		112
Knauth, W. & K.		21
Lewisohn Bros.		15
Muller, Schall & Co.		4,071
Naylor & Co.	101	1,115
Phelps, Dodge & Co.	34	649
Pope, Jas. E., Jr.		39
Pope's Sons & Co		124
Schwarer Bros.		7
Thomsen & Co., A. A.		17
Thomson & Co., D.	11	203
Total	246	10,418
Corres. date 1887	476	8,301

Tin Plates.	Boxes.	Boxes.
American Metal Co.		301
Bridge & Beach Mfg. Co.		339
Bruce & Cook	2,108	76,231
Byrne James		21,677
Central Stamping Co.	2,073	26,311
Coddington & Co., T. B.	4,482	117,197
Corbeirre, Fellows & S.		1,749
Cort & Co., N. L.	897	75,754
Cons. Fruit Jar Co.		849
Crooks & Co., Robert	1,772	47,292
De Mill & Co., H. B.		15,130
Dickerson, Van Dusen	3,950	183,429
Dolly, T. G. F.		112
Henly & Earle	38	38
Iron Clad Mfg. Co.		119
Lalance & Grosjean	432	3,802
Lombard, Ayres & Co.		14,122
Merchant & Co.	129	12,443
Mersick & Co., C. S.		4,342
Morewood & Co., G.	4,250	33,089
Naylor & Co.	79	8,978
Newall Bros.		158
Phelps, Dodge & Co.	1,089	459,163
Potts, W. A., Son & Co.		573
Pratt Mfg Co.	1,320	117,594
Saunders Bros.		330
Shepard & Co., Sidney	1,044	73,925
Somers Bros.	140	440
Stroud & Co		686
Taylor, N. & G.		455
Thomsen & Co., A. A.	6,349	103,046
Warren & Co		1,665
Wheeler & Co.	331	5,201
Whittemore & Co., H.		42,717
Wolff & Reesing	1,534	22,850
Wright & Sons, Peter		165
A. M. Underhill		21
Total	32,017	1,472,495
Corres. date 1887	11,168	1,309,742

Pig-Iron.	Tons.	Tons.
Abbott & Co., Jere		600
Austin, B. & Co		100
Baldwin Bros. & Co.		100
Bartlett & Co., N. S.	100	3,900
Crocker Bros.	200	8,073
Crooks & Co., R.		700
Dana & Co.		600
Downing & Co.		51
Drum'nd, McCall & Co.		20
Erie Despatch		250
Henderson Bros		1,375
Holt, H. N.		50
Lee & Co., James.		325
Milne & Co., A.	230	2,467
Naylor	180	5,717
Perkins, C. L.		5
Pierson & Co.		15
Page, Newell & Co.		13
Pope, Jas. E., Jr.		150
Sanderson & Sons		2
Stetson & Co., G. W.	100	11,107
Tonsila, M. R.		120
Walbaum, W. H.		200
Williamson & Co., Jas.	200	3,400
Wright & Son, P.		20
Total	1,010	40,360
Corres. date 1887	870	105,899

Copper.	Week. Pounds.	Year. Pounds.
Lewisohn Bros. from Liverpool		161,824

Steel Sheets, Billets, Forgings, etc.	Tons.	Tons.
Abbott & Co., Jere.	10	1,896
Arkell, Jas		17
Belcher, H. U		13
Bowker, C. F.		256
Bruce & Cook		7
Carey & Moen		24
Carter, G. T.		273
Cohn, M		138
Cooney, D. J.		20
Crooks, R. & Co.		732
Crousbey, H.		236
Dana & Co.	102	452
Downing & Co., R. F.		325
Henderson Bros.		31
Holt, H. N.		6
Hondolette & D.		106
Hugill, Chas.		149
Irwin & Son, Thos.		1
Lalance & G. Mfg. Co.		245
Lazard Freres		50
Leng, J. S.		20
Lebenberg, N.		36
Littlejohn, Jas.		40
Lundberg, G.	5	105
Mersick & Co.		128
Milne & Co., A.		1,280
Montgomery & Co.		52
Moore's Son & Co.		25
Muller, Schall & Co.		5
Manas. J. & Son		10
Naylor & Co.	5	10,748
Newton & Shipman	4	59
Ogden & Wallace		241
Phelps, Dodge & Co.		3
Phœnix Steel Co.		20
Pierson & Co	12	758
Pilditch, F. S.		226
Power, C. W		50
Prosser, Thomas	60	2,605
Roebling's Sons, J. A.	40	390
Sanderson & Son		42
Shotts Iron Co.		15
Strouse & Co.		37
Temple & S.		8
Union Bridge Co		288
Wagner, W. F.	21	851
Walbaum, W. H.		2,479
Wallace, W. H & Co.		41
Webb, J. B		1
Wetherill & Co		5
Wheeler & Co., E. S.		12
Whiting, E. W.		11
Whitney & Co.		39
Wilson, J. G.		10
Whittemore & Co.		6
Wolff, R. H		217
Wright's Sons & Co.		10
Total	259	24,842
Corres. date 1887	997	62,123

Bar-Iron.	Tons.	Tons.
Abbott & Co., Jere	100	2,237
Abeel Bros.		3
Bacon & Co.		120
Hugh Cranshaw		1
Downing & Co.	1	151
Jacobus, E. Y.		15
Lilienberg, N		5
Lundberg, Gustaf		700
Milne & Co., A.		95
Naylor & Co.		76
Ogden & Wallace		4
Page, Newell & Co.		122
Philip, C. M		20
Stroud & Co		8
Wallace & Co., W. H.		16
Wilson, J. G		7
Totals	101	3,579
Corres. date 1887	40	9,394

Steel & Iron Rods.	Week. Tons.	Year. Tons.
Abbott & Co., Jere.	50	6,221
American Screw Co	100	848
Bacon & Co.		109
Baldwin Bros. & Co.		53
Carey & Moen	25	606
Cohn, M.		60
Dana & Co.	400	2,718
Downing & Co., R. F.	55	247
Galpin, S. A.		2,420
Heyn, A		1,735
Hugill, Chas.		33
Jacobus, E. Y.		12
Lazard Freres		695
Leng, J. S.		17
Lilienberg, N.		100
Lundberg, Gustaf		120
Milne & Co., A		1,408
Montgomery & Co.		65
Muller, Schall & Co.		150
Naylor & Co.		15,289
Newton, & Shipman		2
N. Y. Barb Wire Co.		20
Page, Newell & Co.		152
Perry & Ryer		100
Pierson & Co.	21	31
Pilditch, F. S.		11
Prosser, Thos		132
Roebling's Sons, J. A.	54	1,614
Sanderson & Son		67
Sheldon & Co., G. W.		11
Walschid C. A.		15
Washburn Mfg. Co.		35
Whittemore & Co.		1,705
Wilson, J. G.		26
Wolff & Co., R. H.		1,936
Total	705	38,763
Corres. date 1887	931	84,442

Old Rail.	Week. Tons.	Year. Tons.
Baldwin Bros.		100
Bowening & Archibald.		100
Brown Bros. & Co.		668
Crossman & Bro., W. H.		1,005
D., L. & W. R. R.		409
Frankfort, M.		100
Geisenheimer & Co.		100
Henderson Bros		537
Neumark & Gross		1,912
Stetson & Co., Geo. W.		230
Waltam & Co.		300
Winter & Smillie		80
Total		5,541
Corres. date 1887	1,911	117,692

Sheet Iron.	Tons.	Tons.
Coddington & Co.	35	1,443
Crooks, R. & Co.		10
Newton & S.		4
Wagner, W. F		40
Whitney & Co.		5
Total	35	1,502
Corres. date 1887.	50	1,431

Scrap-Iron.	Tons.	Tons.
Bowring & Archibald.		200
Brown Bros. & Co.		20
Burgess & Co.		172
Crossman, W. H. & Co.		47
Geisenheimer & Co.		565
Gerhardt, P. T.		8
Johnson, L. & Co.		85
Muller, Schall & Co.		15
Neumark & Gross		321
Purdon & W		75
Salter & L.		90
Trowbridge & Co., D.		75
Ward & Co., J. E.		150
Total		1 823
Corres. date 1887		14,664

Charcoal Iron.	Tons.	Tons
Abbott & Co., Jere.		3
Bacon & Co		102
Downing & Co.		25
Lilienberg, N.		15
Luuberg, G.		16
Mersick & Co.		70
Milne & Co.		15
Muller, Schall & Co.		112
Naylor & Co.		97
Page, Newell & Co.		307
Sanderson & Son		1
Total		763

Spiegeleisen.	Tons.	Tons.
Abbott & Co., Jere.		205
Arkell, Jas.		78
Crocker Bros.	95	3,265
Dana & Co.	500	1,551
Geisenheimer & Co.	20	248
Jansen, J. A.		10,293
Naylor & Co.	450	9,317
Perkins, C. L.		2,443
Pierson & Co.		1,050
Total	1,065	28,450
Corres. date 1887.	2,753	80,015

Iron Ore.	Tons.	Tons.
Cormack & Co.		1,022
De Flores, R.		7,478
Earnshaw, A.		6,013
Ennis & Co.		1,721
Johnston & Co		300
Naylor & Co.		3,706
Outerbridge & Co., A. E.	30	940
Wright, Chas. L. & Co.		1,640
Total	30	22,210
Corres. date 1887	2,927	33,966

EXPORTS.

Copper.	Week. Pounds.	Year. Pounds.
Abbott & Co		10,379,049
Amer. Metal Co		5,312,572
Becker, & Co., H.		1,250
Bridgpt. Copper Co		112,000
Copper Queen		224,034
Crossman & Bro.		4,000
Herold, Emil		250,000
Ismay, J. Bruce		115,000
Jones, R. W.		189,984
Ledoux & Co.		110,276
Lewisohn Bros.		4,910,254
Lomal, F. A.		2,691,293
Mendel, S		560,000
Muller, Schall		1,105,000
Neumark & Gross		120,143
Orford Co.		574,881
Parsons & Co.		206,250
Phelps, Dodge		230,664
Pope's Sons		1,338,780
Todd & Co.		112,026
Total		28,557,456
Corres. date 1887.		8,630,648

Copper Matte.	
Abbott & Co	601,145
Amer. Metal Co.,	3,427,532
Kunhardt & Co.	41,652
Ledoux & Co.	469,760
Lewisohn Bros.	1,126,822
Nichols & Co.	516,785
Wilm's, Terhune.	35,665,569
Total	41,849,223
Corres. date 1887.	24,842,881

Copper Ore.	
American Metal Co	405,698
Kunhardt & Co.	37 682
Mallory & Co.	167,065
Total	610 4
Corres. date 1887.	681,0

CURRENT PRICES.

CHEMICALS.

Acid—Acetic.....2¼@2¼
Muriatic, 18°, ℔ 100 lbs ... 1.15@1.20
Muriatic, 20°, ℔ 100 lbs..... 1.35@1.50
Nitric, 36°, ℔ 100 lbs..... 5.00
Nitric, 42°, ℔ 100 lbs..... 5.50@7.00
Oxalic.....6¼@8
Sulphuric, 60°, ℔ 100 lbs..... 90@95
Sulphuric, 66°, ℔ 100 lbs ..... 95@1.10
Alkali—36 p. c..... 1.10@1.15
48 p. c .....1.22½@1.25
Refined, 58°..... 1.15 @1.25
Alum—Lump, ℔ lb..... 1¾
Ground, ℔ lb..... 1½@2
Lump ℔ ton, Liverpool £5
Sulphate of Alumina, ℔ ton £3 15
Aqua Ammonia—18°, ℔ lb..... 4¾
20°, ℔ lb..... 6
22°, ℔ lb..... 6@7
26°, ℔ lb..... 10@11
Ammonia—Sul., ℔ 100 lbs... 3.10@3.15
Carb., per lb..... 7¾
Muriate, per lb..... 6½@8
Arsenic—White, powdered, ℔ lb. 3¼@3½
Red, ℔ lb..... 5½@5¾
White, at Plymouth, ℔ ton. £11 10
Asbestos—Am., p. ton..... $20@$100
Italian, p. ton, c. i. f. L'pool ...£18 0 0
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb .....5@6c.
Hard, ℔ ton..... $28.00
Trinidad, refined, ℔ ton..... $30.00
Barytes—Sulph., Am. prime white 16.00
Sulph., foreign, floated, p. ton.....19.00
Sulph., off color, p. ton 12.50
Carb., lump, f.o.b. L'pool, ton ...£6 0 0
No. 1, casks, Runcorn " " £4 10 10
No 2. bags, Runcorn " " 3 15 0
Bleach—Over 35 p.c., ℔ lb. 1.85 @1.92½
Borax—℔ lb..... 7¾
Refined at Liverpool, ℔ ton..... £31
Brimstone—*See Sulphur.*
Bromine—℔ lb..... 36
Chalk—℔ ton..... 3.50
Precipitated, ℔ lb..... 4
China Clay—English, ℔ ton..... 18.50
Southern, ℔ ton..... 13.50
Chrome Yellow—℔ lb..... 10@25
Cobalt—Oxide, ℔ lb..... 2.50@2.90
Copper—Sulph. English Wks. ton £20 10s.
Precip., Eng. Wks, unit.. fluctuating
Copperas—Common, ℔ 100 lbs. 50@57½
Best, ℔ 100 lbs..... 1.00
Liverpool, ℔ ton, in casks ...£1 16 1.20
Cream of Tartar—Am. 99%....32@32¾
Powdered, 99 p c..... 33½
Emery—Grain, ℔ lb..... 4
Flour, ℔ lb..... 2½
Feldspar—Ground, ℔ ton.....15.00
Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb..... 2
Gypsum—Calcined, ℔ bbl..... 1.25
Iodine—Resublimed..... 3.60
Kainit—℔ ton..... 10 00
Kaolin—*See China Clay.*
Lead—Red, ℔ lb..... 6
White, American, in oil, ℔ lb..... 6½
White, English, ℔ lb..... 7½
Acetate, or sugar of.....13@13½
Lime Acetate—Amer. Brown. 1.15@1.20
" Gray. .2.25@2.30
Litharge—Powdered, ℔ lb..... 6@6¼
English flake, ℔ lb..... 9
Magnesite—Greek, ℔ ton..... 10.00
Manganese—lump, c.i.f. L'pool. 55s.
Per unit, up or down..... 1s. 6d.
Ground £5 10
Mercuric-Chloride—(*Corrosive Sublimate*) ℔ lb..... 55
Mineral Wool—℔ lb..... 2
Mica—In sheets according to size,
1st quality, ℔ lb.....25@$6 00
Phosphate Rock—S. Carolina,
per ton f. o. b. Charleston..... 5.00
Ground, ex vessel New York 9.50@9.75
Canadian Apatite, lump, f. o. b. at
shipping port, ℔ unit..... 24
Phosphorus—℔ lb..... 65
Plumbago—Ceylon, ℔ lb..... 4@5
American, ℔ lb..... 5@7
London, ℔ cwt..... £0 15 0
Potassium—Cyanide, ℔ lb .... 39@40
Bromide, ℔ lb..... 37
Chlorate, ℔ lb..... 14½@14¾
Carb. ℔ lb..... 4.70@5.50
Caustic, ℔ lb..... 7½
Iodide..... 2.70@2.75
Muriate, ℔ 100 lbs..... 1.80@1.85
Nitrate, refined, ℔ lb..... 6
Bichromate, ℔ lb..... 10½
Sulphate, ℔ 100 lbs..... 1.15@2.35
Yellow Prussiate, ℔ lb..... 19
Red Prussiate, ℔ lb..... 42
Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb..... 1¾
Powdered, pure, ℔ lb..... 2¼@2½
Pyrites—Non-cupreous, p. unit, d. 5
Quartz—Ground, ℔ ton..... 18.00
Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb..... 6@10
Eng., powdered, ℔ ton..... £4
Lump, ℔ ton..... £5
Salt—Liverpool, ground ℔ bbl.. 70
Turk's Island, ℔ bbl..... 25
Salt Cake—℔ 100 lbs..... 50
Saltpeter—Crude, ℔ lb..... 5@5½
Refined, ℔ lb..... 6@7
Soda Ash—Carb., 48 ℔ 100 ℔... 1.22½
Caustic, 48 ℔..... 1.22½
High test..... 1.12½@1.15
Soda Caustic, 60%.....2.30 @2.35
" " 70%.....2.15 @2.20
" " 74-5%..... 2.20
Sal, English, ℔ 100 lbs.... 1.15
Sal, American, ℔ 100 lbs .... .95 @1.20
Nitrate, ℔ 100 lbs..... 2.12½@2.20
Strontium—Nitrate ℔ lb..... 10½
Sulphur—Roll, ℔ lb..... 1¾
Flour, ℔ lb..... 2
Crude Brimstone, 2s., ℔ ton. 20.00@23.00
Crude Brimstone, 3ds, ℔ ton. 19.50@21.00
Talc—Ground French, ℔ lb..... 1¼
Domestic, ℔ lb..... 6
Domestic, ℔ ton..... 15.00
c. i. f. Liverpool, ℔ ton..... £4 5 0
Tannin—Pure, ℔ lb.....
Vermillion—American, ℔ lb... 58
English, ℔ lb..... 82@85
Vitriol—(Blue), Ordinary, ℔ lb... 5½
Extra, ℔ lb..... 6@6¼
Zinc Oxide—Am., Dry, ℔ lb..... 4½
Antwerp, Red Seal, ℔ lb..... 6@6½
Paris, Red Seal, ℔ lb..... 6¼@7
* Spot.

BUILDING MATERIAL.

Bricks—Pale, per 1,000 ..... 2.25@2.75
Jerseys, per 1,000..... 4.00@5.00
Hackensacks..... 4.75@5.25
Up Rivers, per 1000..... 4.25@5.00
Haverstraw, per 1,000..... 5.75@6.25
Haverstraw seconds, per 1000 4.25@5.50
Fronts, nominal.
Croton..... 14.00@16.00
Wilmington..... 23.00@24.00
Philadelphia..... 24.00@26.00
Trenton..... 24.00@25.00
Baltimore..... 37.00@40.00
Building Stone—Amherst
freestone, per cu. ft..... 95@1.00
Brownstone, per cu. ft..... 1.00@1.35
Granite, rough, ℔ cu.ft..... 45@1.25
Granite, Scotch..... 1.00@1.05
Cement—Rosendale, ℔ bbl ..... 90@1.00
Portland, American, ℔ bbl..... 2 00
Portland, foreign, ℔ bbl... 2 20@2.45
Keene's coarse..... 4.50@5.50
Keene's fine..... 7.00@8.25
Slate—Purple and green roofing, per 100 ft..... 5.00@6 00
Red roofing, per 100 sq. ft... 15.00
Black, roofing, per 100 sq. ft. 4.00@5 00
Lime—Rockland, common..... 95@1.00
Rockland, finishing..... 1.25
St. John, com. and finish..... 90
Labor—Ordinary, per day.... 1.50@2.50
Masons, per day..... 4.00
Plasterers, per day..... 4.00
Carpenters, per day..... 3.50
Plumbers, per day..... 3.50
Painters, per day..... 2.50@3.50
Stonesetters, per day..... 3.50@4.00

THE RARER METALS.

Aluminum—(Metallic), per lb...$5.00
Arsenic—Metallic, per lb..... 32
Barium—(Metallic), per lb..... 975.00
Bismuth—(Metallic), per lb..... 2.40
Cadmium—(Metallic), per lb..... 150.00
Calcium—(Metallic), per oz..... 150.00
Cæsium—(Metallic).....
Cerium—(Metallic) per oz..... 160.00
Chromium—(Metallic), per lb...200 00
Cobalt—(Metallic), per lb..... 6.00
Didymium—(Metallic), per oz...160.00
Erbium—(Metallic), per oz... ...140.00
Gallium—(Metallic), per oz 3250.00
Glucinum—(Metallic) 4.50
Indium—(Metallic), per oz..... 158.00
Iridium—(Metallic), per lb.. ...700.00
Lanthanum—(Metallic), per oz.175.00
Lithium—(Metallic), per oz..... 160.00
Magnesium—Per lb..... 4.00
Manganese—Metallic, per lb... 1.10
Molybdenum—(Metallic), per oz. 6.00
Nickel—(Metallic), per lb..... .65
Niobium—(Metallic), per oz..... 128.00
Osmium—(Metallic), per lb 640.00*
Palladium—(Metallic), per lb...512.00
Platinum—(Metallic), per lb...128.00
Potassium—Metallic, per oz... 2.00
Rhodium—(Metallic), per lb....512.00
Ruthenium—(Metallic), per oz. 112.00
Rubidium—(Metallic), per oz...200.00
Selenium—(Metallic), per oz.. .. 3.00
Sodium—(Metallic) per lb..... 4.50
Strontium—(Metallic), per oz..128.00
Tantalium—(Metallic) per oz....144.00
Telurium—(Metallic) per oz.... 9 00
Thallium—(Metallic) per oz..... 3.00
Titanium—(Metallic) per oz....32.00
Thorium—(Metallic) per oz.....272.00
Tungsten—(Metallic) per oz..... 1.25
Vanadium—(Metallic), per oz...320.00
Yttrium—(Metallic), per oz 144 00
Zirconium—(Metallic), per oz..240.00

METALS.

Aluminum—
Bronze (10 %), ℔ lb..... 46c.
Copper—
Lake Ingot, Spot, ℔ lb..... 17·00c.
Electrolytic, ℔ lb..... 16·50c.
Casting Brands, ℔ lb..... 15·50c.
Chili Bars, London, ℔ ton £99
Sheet Copper (according to size), ℔ lb.....25 @38c
Lead—
Domestic, Common, Spot.. 5·05c.
Foreign..... 5 25c.
Sheet, ℔ lb, net..... 7·00@7¼c. net
Pipe, ℔ lb..... 6½c. "
Tin lined Pipe, ℔ lb..... 15c. "
Shot, ℔ lb..... 7¼c
Tin—
Tin Plates..... 14s. 6d.
Tin Spot in London £100 2s 6d. @£100 5s.
Pig tin, spot in N. Y., ℔ lb.. 22·75c.
Zinc—
Domestic spelter, ℔ lb..... 4·90c.
Foreign spelter, ℔ lb..... 5¾c.
Silesian, ton..... £18
Sheet, American, ℔ lb..... 6¼c.
Antimony—Hallet's, per lb.. 9¾c.
Cookson's, per lb..... 12¼c.
Star Antimony..... £38 5s.
Quicksilver—Per lb..... 61@63c.
London, ℔ flask..... £7@£7¼

IRON AND STEEL.
New York Prices.

American Pig-Iron.—At tidewater.
No. 1 X..... $18.00@$18.50
No. 2 X..... 17.00@ 17 50
Forge..... 16.00@.....
Scotch Pig—Coltness... 20.50@ 21.00
Clyde..... 19.50@.....
Dalmellington..... 19 50@.....
Summerlee..... @.....
Shotts..... 20.00@.....
Langloan..... 20.00@.....

By Cable to-day to the Metal Exchange :
Scotch Warrants.....41s. 8d.
Coltness, at Glasgow..... 49s. 9d.
Langloan, at Glasgow..... 47s. 0d.
Summerlee, at Glasgow..... 50s. 6d.
Gartsherrie, at Glasgow..... 47s. 0d.
Glengarnock, at Ardrossan..... 45s. 0d.
Dalmellington, at Ardrossan..... 42s. 0d.
Eglinton, at Ardrossan ..... 41s. 9d.
Bessemer Pig—
Foreign, nominally..... $19.50@$20.00
Domestic ..... 16@18.00
Spiegeleisen—
German, 20 per cent..... $26.00@$26.50
English, 20 " " ..... 27.00@ 27.50
" 30 " " ..... 31.00@ 31.50
Ferro Manganese, 80%..... 50.50@ 51 00
Steel Blooms, nominally .....
Steel Billets, " 28 50@ 29.00
Steel Nail Slabs, " 29.50@.....
Steel Wire Rods, " 39.75@ 40.00
Steel Rails—
Heavy sections, at mill...$28.50@ 29.00
Light " " ..... 30.50@ 34.50
Structural Iron and Steel—
Bridge Plate, at mill..... 1·9 @2c.
Angles, at mill..... 2·00@2·10c.
Tees, at mill..... 2·40@2·50c.
Steel Angles, at mill..... 2·2 @2·3c.
Beams and Channels, on wharf, 3·3c. base
Steel Plates—
Tank and Ship, on wharf.....2 25@2·4
Shell, on wharf..... 2·4 @2·6
Flange, " ..... 2·60 @2·75
Fire-Box, on wharf..... 3 @3·50
Iron Plates—
Common tank, on wharf....1·9@2·0c.
Refined, on wharf.....2·1@2·3c.
Shell, " .....2·1@2 3c.
Flange, " .....3·4@3·5
Extra flange, on flange..... 3·5@3 75
Bar Iron—
Refined..... ....1·7 @1·9c.
Common ....1·55@1 65c.
Merchant Steel—
American tool ..... 8½@10c.
Special grades..... 13 @20c.
Crucible machinery..... 5 @6c
" spring..... 4½c.
Bessemer machinery..... 2·2@2·3c
" spring..... 2·7@2·9c.
Cast-Iron Pipe—
According to size..... $25 00@$32.00
Wrought Iron Pipe—nominally—
Butt-Welded, Plain and Tarred, 55% disc;
Galv., 47½% disc.
Lap-Welded, Plain and Tarred, 65% disc;
Galv., 55% disc.
Boiler Tubes—Per cent disc 62½%
Rail Fastenings—
Spikes..... ....2·1 @2·15c. delv'd
Angle Fish-bars..... @1·9c.
Bolts and Sq Nuts.....2·7 @2·8c
" Hex. "..... 3 @
Wrought Scrap—
Foreign, *ex store*..... @
No. 1 Yard *to vessel*..... 18.00@ 19.00
Cast Scrap..... 15.50@ 16.50
Old Car Wheels..... 18.00@
Old Rails—Tees ..... 23.00@ 24.00
—Doubles ..... @
Nails—In car-load lots..... 1·85@1·90c.
—From store..... 1·95@ 2.00

Louisville Prices.

Hot Blast Irons—
So. Coke, No. 1..... ....$17.00@$17.50
" " No. 2..... 16 00@ 16.50
" " No. 2½..... 15.50@ 16.00
Mahoning Valley (Lake Ore
Mixture)..... 18.00@ 18.50
So. Charcoal, No. 1..... 17.50@ 18.00
" " No. 2..... 16.50@ 17.00
Missouri Charcoal No. 1.... 19.00@ 19.50
" " No. 2.... 18.50@ 19.00
Forge Irons—
Neutral Coke..... $13.75@$14.50
Cold Short..... 13.50@ 14.00
Mottled..... 12.50@ 13.00
Car Wheel and Malleable Irons—
Southern (standard brands).$22.00@$24 00
" (other brands)..... 18 00@ 18 50
Lake Superior..... 21.50@ 22.50

Pittsburg Prices.

Coke or Bituminous Pig—
Foundry No. 1..... ....$17.50@18.00
Foundry No. 2..... ....16.50@16.75
Gray Forge No. 3..... 16.25@16.50
" " No. 4..... 15.25@15.50
White..... 14.50@15.00
Mottled..... 15.00@15.25
Silvery..... 16.50@16.50
Bessemer..... 18.00@18.25
Low Phos..... 22.50@23.00 cash
Charcoal Pig—
Foundry No. 1..... 23.50@24.50
Foundry No. 2..... 22.00@24.00
Cold-Blast..... 25.00@27.00
Warm-Blast..... 24.00@25.00
20 p. c. Spiegel..... 27.50@27.75
Muck-Bar..... @29.00
Steel Blooms..... 29.00@29.·5
Steel Slabs..... @29 00
Steel Crop Ends..... @19.00
Steel Bloom Ends..... @19.00
Ferro Manganese, 80%..... 54.00@.....
Steel Billets..... ..29.00 at works
Old Iron Rails..... 25.00@ .....
Old Steel Rails..... 20.00@ .....
No. 1 W. Scrap..... 20 00@20.50
No. 2 W. Scrap..... 18.00@18.50
Steel Rails..... *31.50@32.00
" light sections..... *32.00@33.00
Bar Iron, nominal..... 1.75@ 1.80
Nails..... $1.90 usual discount
Steel Nails..... $1.90
Two per cent off for cash.
* At works.

Philadelphia Prices.

Foundry No. 1..... $18.00@19.00
Foundry No. 2..... 17.00@18 00
Gray Forge..... 15.50@16.50
Bessemer Pig..... 19.50@20.00
Steel Rail Blooms..... 29.50@nom
Foreign Bessemer..... 19.50@20.00
Spiegeleisen..... 26.50@27.00
Scrap, Selected..... 22.00@22.50
No. 1..... 21.00@20 00
Cargo Scrap..... 21.00@20.50
Muck-Bars..... 27.50@.....
Merchant Iron..... 1.75@ 1.95
Plate Iron..... 2.00@.....
Tank Iron..... 2.00@ 2.20
Skelp Iron..... 1.80@ 1.90
Angles..... 2.00@ 2.10
Beams and Channels..... 3.30.@..
Nails..... 1.90@ 2.00
Steel Rails..... 30.00@31.00
Old Rails..... 21.00@22.00
Best refined.....2@2·1c. base

STOCK MARKET QUOTATIONS.

Birmingham, Ala.

Company.	Bid.	Asked.
Ala. Conn. C..	....	25
Bir. Min. & Mfg.	120	190 @192½
Bir. Fur. & Mg.	....	16
Broken Arrow C. & M..	....	13½@ 14
Decat. L. Imp. & Fur..	11 @11¾	12¼@ 13
DecaturMin. L.	23	...
Enterprise Mfg. Co	35	50@90
Jagger-Townley C & C. Co.	....	11
Mag-Ellen C. & Mg	65	...
No Bus. Crk., C. & Mg..	4	7½
Pioneer M. & Mfg	....	....
Sloss I. & S..	16	17
* Sloss I. & S..	77¾	....
Sheffield C. & I.	85	87¼@ 89
Tenn. C. & I. Co.	29	29¾
*Williamson Iron Co...	99¾	....
Woodstock S&I	50	52 @ 53

* Bonds.

Highest and lowest prices bid and asked during the week ending September 3d.

Pittsburg, Pa.

Company.	H.	L.	Closing
Allegegheny Gas..	65.00	65.00	65.00
Bridgewater Gas..	....	....	....
Charlotte Mg. Co..	5.00	4.50	5.00
Chartiers Val. Gas.	58.00	57.00	58.00
Columbia Oil Co..	4.50	4.00	4.50
Consignee Mg. Co.	....	....	....
Forest Oil Co....	....	....	....
Gogebic Iron Syn..	....	....	....
Iron City Mining..	....	....	....
Kittanning Gas...	....	....	....
La Noria Mining ..	2.00	1.75	2.00
Lustre Mining....	....	....	....
M'f'turers' Gas....	24.50	24.50	24.50
Nat. G. Co. of W. Va.	....	....	....
N. Y. & C. Gas Coal	30.00	30.00	30.00
N. Y. & Westmoreland G., C. & C..	....	....	....
Ohio Valley Gas ..	39.00	38.00	38.00
Pennsylvania Gas.	....	....	....
People's Nat. Gas.	....	....	....
Philadelphia Co...	46.13	44.38	44.75
Pine Run Gas	....	....	....
Pittsburg Gas.....	....	....	....
Royal Gas.....	....	....	....
Silverton Mining..	2.00	1.88	1.88
South Side Gas...	....	....	....
Tuna Oil Co.....	62.50	60.00	62.50
Washington Oil..	65.00	57.00	59.00
W't'h'se Air-Brake	122.00	118.00	118.00
West'house Brake	62.50	61.00	62.00
Westmoreland & Cambria Gas..	45.50	45.60	45.60
Wheeling Nat. Gas.	28.00	27.00	27.75
Yankee Girl Mg...	....	....	....

Highest and lowest prices bid and asked during the week ending Sept. 4th.

Foreign Quotations.

Company.	*London.* Highest.	August 25. Lowest.
Alturas Gold, Idaho...	9s.	8s.
Arizona Copper, Ariz..	18s. 6d.	18s.
Birdseye Creek, Cal..	6s.	5s.
Carlisle, N. Mex	18s.	16s.
Centennial, Cal.....	7s. 6d.	5s.
Colorado United, Colo..	5s	3s.
Columbian, S. A.....	£1¾	£1⅝
Cons. Esmeralda, Nev..	7s. 6d.	6s. 6d.
Denver Gold, Colo.....	1s. 3d.	9d.
Dickens Custer, Idaho.	6s.	5s. 6d.
Eberhardt, Nev	1s.	6d.
El Callao, Venezuela....	£2¼	£2¼
Empire, Mont	18s.	17s.
Flagstaff, Utah.....	4s. 6d.	3s. 6d.
Garfield, Nev.....	15s.	12s. 6d.
Gold Hill, N. C.....	2s.	1s.
Ilex, Cal.....	10s.	7s. 6d.
Josephine, Cal	7s. 6d.	5s.
Kohinoor, Colo.....	3s.	2s.
Mason & Barry, Portugal	£9⅜	£9⅛
Montana Lt., Mont	£1¾	£1⅝
New California, Colo...	6s.	5s.
New Emma, S., Utah...	4s. 9d.	4s. 3d.
New Hoover Hill, N. C.	2s.	1s. 6d.
New La Plata, Colo...	2s.	1s. 6d.
Pittsburg Cons., Nev...	£1¼	£1
Plumas Eureka, Cal....	£1 3-16	£1 1-16
Quebrada, Venezuela...	£4¾	£4⅛
Richmond Con., Nev...	£3¾	£3¼
Ruby & Dunderberg, Nev	3s. 6d.	2s. 6d.
Russell Gold, N. C.....	4s.	3s. 6d.
Sierra Buttes, Cal.....	£⅜	£⅛
Stanly, N. C.....	7s. 6d.	5s.
Tolima, Colombia, S.A.	£2	£1⅞
U. S. Placer, Colo.....	12s.	10s.
Viola Lt., Idaho	16s. 6d.	15s. 6d.
	*Paris.**	August 23.
El Callao.....	62.50	62.50
Golden River	405	405
Lexington.....	100	100
" parts	4.50	4.50
Rio Tinto.....	533 75	533 75
" obligations...	517.00	517.00
" "	2d. 498.75	498.75
Tharsis	140.00	140.00

* Francs.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Date and amount of last.			Dividends. Total paid.	Date and amount of last.		
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*				$555,000	Jan.	1887	.15
2	Alice, S. C.	Mont	10,000,000	400,000	25	*				750,000	Sept	1886	.06¼
3	Alturas, G.	Idah.	1,500,000	300,000	5					95,000	Sept	1886	50
4	Amy & Silversmith, S.	Mon.		341,419						247,530	Aug.	1887	12½
5	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	480,000	Aug.	1888	1.50
6	Argenta, S.	Nev.	10,000,000	100,000	100	325,000	July	1885	.10	40,000	Feb.	1880	20
7	Aurora, I.	Mich	2,000,000	100,000	20					155,000	Oct.	1887	1.87½
8	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
9	Belle Isle, S.	Nev.	10,000,000	100,000	100	145,000	Feb	1887	20	300,000	Dec.	1879	.25
10	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,718,000	July	1888	.50	15,397,200	Apl	1876	1.00
11	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	57,500	Nov.	1887	25	187,500	Jan	1887	10
12	Black Bear, G.	Cal.	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1883	.20
13	Bodie Con., G. S.	Cal.	10,000,000	100,000	100	450,000	Feb.	1888	.50	1,295,000	Apl.	1885	.50
14	Bonanza Developm't	C&M	3,000,000	300,000	10					135,000	Oct.	1882	.15
15	Bonanza K'g, Cons. S.	Cal.	1,000,000	100,000	10	*				185,000	Feb.	1885	.10
16	Boston & Mont, G.	Mont	2,500,000	250,000	10	*				520,000	Jun	1886	.15
17	Boston & Mont., C. S.	Mont	2,500,000	100,000	25	*				200,000	July	1888	2.00
18	Breece, S.	Colo.	,000,000	200,000	25	*				2,000	Feb.	1880	.01
19	Brooklyn Lead, L. S.	Utah	500,000	50,000	10					127,000	July	1887	.05
20	Bulwer, G.	Cal.	10,000,000	100,000	10	80,000	May	1888	.20	175,006	Jan.	1884	.10
21	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10
22	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000				30,850,000	Sept	1888	5.00
23	Carbonate Hill, S. L.	Colo.	2,000,000	200,000	10	*				80,000	Apl.	1884	.05
24	Caribou Con., S.	Colo.	1,500,000	150,000	10	*				50,000	Mch	1880	.10
25	Castle Creek, G.	Idah.	100,000	100,000	1					51,000	Oct.	1883	.03
26	Catalpa, S. L.	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
27	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,890,000	Aug.	1888	1.50
28	Christy, S.	Utah	10,000,000	100,000	100					10,000	Jun.	1885	.10
29	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
30	Colorado Central, S. L.	Colo.	2,750,000	275,000	10	*				323,750	Aug.	1888	.05
31	Confidence, S. L.	Nev.		24,960		287,440	Apl.	1887	.50	174,720	Aug.	1888	1.00
32	Cons. Cal. & Va., G. S.	Nev.	21 600 000	216,000	100	108,000	Jan.	1885	.20	2,116,800	Aug.	1888	.50
33	Contention, S.	Ariz.	12,500,000	250,000	50					†2,587,000	Dec.	1884	.25
34	**Cop. Queen Cons, C.	Ariz.	1,400 000	140,000	10					70,000	July	1888	.50
35	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*				210,000	Aug.	1886	.05
36	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,775,000	Apl.	1888	.50	11,588,000	Jan.	1875	2.00
37	Daly, S. L.	Utah	3,000,000	150,000	20					712,500	Aug.	1888	.25
38	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	‡				§1,000,000	Nov.	1887	.10
39	Derbec B. Grav., G. S.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	180,000	May	1887	.10
40	Dunkin, S. L.	Colo.	5,000,000	200 000	25	*				335,000	July	1888	.05
41	Eclipse	Colo.	100,000	100,000	1					20,000	Nov.	1887	.10
42	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1883	.50	170,000	July	1887	.05
43	Empire Lt., G.	Mont	500,000	100,000	5					70,500	Oct.	1887	.37½
44	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	500,000	July	1886	1.00	4,918,500	July	1888	.25
45	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,400,000	Nov.	1883	.50
46	Excelsior, G.	Cal.	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1880	.25
47	Father de Smet, G.	Dak.	10,000,000	100 000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885	.20
48	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871		720,000	July	1888	2.00
49	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*				190,000	July	1886	.10
50	Fresno Enterprise, G.	Cal.	5,000,000	100,000	50		Mch	1883	.10	110,000	July	1882	.10
51	Garfield Lt., G. S.	Nev.	500,000	100,000	5					85,000	Apl.	1888	.12½
52	Golconda, G. S.	Idah.	1,000,000	100,000	10					120,000	May	1888	.60
53	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	5,301,000	Jun.	1888	.50	3,826,800	Oct.	1870	10.00
54	Grand Central, S.	Ariz.	1,000,000	100,000	10					625,000	Dec.	1882	.25
55	Grand Prize, S.	Nev.	10,000,000	100,000	100	570,000	Apl.	1886	.50	495,000	Mar.	1884	.25
56	Granite, S.	Colo.	125,000	125,000	1					6,250	May	1883	.01
57	Granite Mountain, S.	Mont	10,000,000	400,000	25					4,500,000	July	1888	.25
58	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
59	Hale & Norcross, G. S.	Nev.	11,200,000	112,000	100	5,086,000	July	1887	.50	1,822,000	Aug.	1888	.50
60	Hall-Anderson, G.	N.S.	150,000	150,000	1					7,000	Jan.	1882	.05
61	Hecla Con., S. G. L. C.	Mont	1,500,000	30,000	50					1,197,500	Aug.	1888	.50
62	Hel'a Mg & Red, G.S.L.	Mont	3,315,000	663,000	5	*				197,970	July	1886	.06
63	Holmes, S.	Nev.	10,000,000	100,000	0	300,000	Sept	1885	10	75,000	Apl.	1886	.25
64	Holyoke, G.	Idah.	200,000	200,000	1					27,000	Feb.	1883	.10
65	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,193,750	Aug.	1888	.20
66	Honorine, S. L.	Utah	500,000	250,000	2	25,000	Jun.	1883		125,000	Sept	1887	.05
67	Hope, S.	Mont	1,000,000	100,000	10	*				233,252	Apl.	1888	.25
68	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*				4,000,000	Nov.	1884	.50
69	Hubert, G.	Colo.	500,000	50,000	10	*				234,000	July	1888	.08
70	Idaho, G.	Cal.	310,000	3,100	100					4,943,500	Aug.	1888	10.00
71	Ideal, S. L.	Colo.	1,500,000	50,000	10					15,000	Oct.	1886	.05
72	Illinois, S.	N.M.	100,000	100,000	1	*				25,000	Jan.	1887	.25
73	Independence, S.	Nev.	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
74	Indian Queen, S.	Nev.	250,000	125,000	2					368,750	July	1883	.03
75	Iron Hill, S.	Dak.	2,500,000	250,000	10	111,250	Jun.	1888	.04	156,250	Nov.	1887	.07½
76	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*				2,300,000	July	1888	.20
77	Jackson, G. S.	Nev.	5,000,000	50,000	100	10,000	Nov	1880	.20	45,000	Oct.	1886	.10
78	Jay Gould	Mont	2,000,000	400,000	5	*				267,000	Jun.	1888	.09
79	Jocuistita, S.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
80	Jumbo, G.	Colo.	2,000,000	200,000	10					35,000	Oct.	1887	.02½
81	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov	1881	.30	1,350,000	Dec.	1886	.10
82	La Plata, S. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept	1882	.30
83	Leadville Cons., S.L.L.	Colo.	4,000,000	400,000	10	*				423,000	Apl.	1887	.05
84	Lexington, G. S.	Mont	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
85	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*				800,000	July	1888	.10
86	Little Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	50
87	Manhattan, S.	Nev.	5,000,000	50,000	100	250,000	Dec	1887	1.00	437,500	Feb	1886	.25
88	Marion Bullion, G.	N.C.	500,000							15,000	Jan.	1886	
89	Martin White, S.	Nev.	10,000,000	100,000	100	1,150,000	Mar.	1886	25	140,000	Dec.	1886	.25
90	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*				122,500	Feb.	1888	5.00
91	Minnesota, C.	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1 00	1,820,000	Mar.	1876	
92	Mono, G.	Cal.	5,000,000	50,000	100	616,000	Sept	1887	.50	12,500	Mar.	1886	.25
93	Montana, Lt., G. S.	Mont	3,300,000	660,000	5	*				2,010,963	Apl.	1888	.25
94	Morning Star, S. L.	Colo.	1,000,000	100,000	10					775,000	Mar.	1888	.25
95	Moulton, S. G.	Mont	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
96	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
97	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	120,000	Aug.	1888	.20
98	Napa, Q.	Cal.	700,000	100,000	7					290,000	Jan.	1883	.10
99	Navajo, G. S.	Nev.	10,000,000	100,000	100	485,000	Apl.	1888	.30	325,000	Feb.	1885	.25
100	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06¼
101	Northern Belle, S.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl.	1883	50
102	North Belle Isle, S.	Nev.	10,000,000	100,000	100	250,000	Mar.	1887	.50	230,000	May	1888	.50
103	Ontario, S. L.	Utah	15,000,000	150,000	100					9,425,000	Aug.	1888	.50
104	Ophir, G. S.	Nev.	10,000,000	100,000	100	4,059,440	Aug	1887	.50	1,595,800	July	1882	1.00
105	Original, S. C.	Mont	1,500,000	60,000	25	*				120,000	Apl.	1888	.05
106	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,172,500	Sept	1888	1 00
107	Oxford, G.	N. S.	125,000	125,000	1	*				38,500	Oct.	1885	.02
108	Paradise Valley, G. S.	Nev.	10,000,000	100,000	100	62,000	Apl.	1888	.15	150,000	Apl.	1887	.10
109	Parrott, C.	Mont	1,800,000	180,000	10					210,000	July	1888	.20
110	Peacock, S. G. C.	N.M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
111	Pleasant Valley, G. S.	Cal.	10,000,000	100,000	100	10,000	Mar.	1884	.10	30,000	Dec.	1882	.05
112	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
113	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
114	Prussian, S. L.	Colo.	1,500,000	150,000	10					132,000	Jan	1883	.10
115	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100					1,417,692	July	1888	1.50
116	" com., Q.	Cal.	5,700,000	57,000	100					151,000	July	1882	.40
117	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1862		4,970,000	Aug.	1888	5.00
118	Richmond, S. L.	Nev.	1,350,000	54,000	25	*				4,312,587	Jun.	1887	1.25
119	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	99,785	Feb.	1880	.50
120	Rising Sun, S.	Dak.	750,000	150,000	5	*				52,000	May	1881	.07½
121	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
122	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20					100,000	Dec.	1882	.50
123	Rooks, G.	Vt.	500,000	50,000	10	*				61,000	Apr	1885	.30
124	Savage, S.	Nev.	11,200,000	112,000	100	6,380,000	Aug	1888	.50	4,460,000	July	1869	3.00
125	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				50,000	July	1884	
126	Shoshone, G.	Idah.	150,000	150,000	1					7,500	Apl.	1883	.01
127	Sierra Buttes, G.	Cal.	2,225 000	122,500	10					1,492,557	Apl.	1888	.12½
128	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	6,125,000	July	1888	.25	102,000	Jan.	1871	1.00
129	Sierra Nevada, S. L.	Idaho	1,000,000	¶	1	*				20,000	June	1888	.01
130	Silver Cord, G. S. L.	Colo.	5,000,000	500,000	10					225,000	Nov.	1883	.25
131	Silver King, S.	Ariz.	10,000,000	100,000	100	50,000	Jun.	1888	.50	1,950,000	July	1887	.25
132	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*				80,000	Nov.	1886	.02
133	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*				3,112,500	Dec.	1887	.20
134	Smuggler, S. L.	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25
135	Socorro, C.	N. M.	250,000	2,500	100					4,000	Mch	1882	.00¾
136	Spring Valley, G.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan	1881	25
137	Standard, G. S.	Cal.	10,000,000	100,000	100	25,000	Oct.	1884	.25	3,595,000	Jun.	1888	.05
138	Stormont, S.	Utah	500,000	500,000	1	*				155,000	Nov	1881	.05
139	St. Joseph, L.	Mo.	1,500,000	150,000	10	*				844,000	Dec	1887	.20
140	Surinam, G.	D. G.	3,000,000	600,000	5					105,000	Nov	1887	.05
141	Swansea, G.	Colo.	600,000	60,000	10	*				9,000	Apl.	1888	.02½
142	Syndicate, G.	Cal.	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
143	Tamarack, C.	Mich.	1,000,000	40,000	25	520,000	Apl	1885	3.00	440,000	Oct.	1888	5.00
144	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20
145	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
146	United Verde, C.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
147	Valencia, M.	N. H.	150,000	1,500	100	*				37,500	Apl	1886	2.50½
148	Viola Lt., S. L.	Idah.	750,000	150,000	5	*				222,500	Dec.	1887	.12
149	Yankee Girl	Colo.	2,500,000	250,000	10					1,275,000	July	1887	.10
150	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,448,000	Dec	1885	.75	2,184,000	Aug	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par Value.	Assessments. Total levied.	Date & am't of last.		
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*			
2	Allouez, C.	Mich	2,000,000	80,000	25	$657,000	Jun	1888	1.00
3	Alpha Con., G. S.	Nev.	3,000,000	30,000	100	536,250	Jan.	1888	87½
4	Alta, S.	Nev.	10,080,000	100,800	100	2,191,200	May	1888	.50
5	Amador, G.	Cal.	400,000	200,000	2	*			
6	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	Jun	1877	.50
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5				
8	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5				
9	Aspen Mg. & S., S. L.	Colo	2,000,000	200,000	10				
10	Barcelona, G.	Nev.	5,000,000	200,000	25	*			
11	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500	Jan.	1888	.10
12	Belmont, S.	Nev.	5,000,000	50,000	100	735,000	Apl.	1886	.10
13	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	2,029,390	Jun.	1888	.25
14	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*			
15	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	*			
16	Black Oak, G.	Cal.	3,000,000	300,000	10	*			
17	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000	Nov	1883	.25
18	Bremen, S.	N. M	5,000,000	500,000	10	*			
19	Brunswick, G.	Cal.	2,000 000	400,000	5	*			
20	Bullion, G. S.	Nev.	10,000,000	100,000	100	4,007,000	Aug.	1888	.50
21	Bye and Bye	Ariz.	1,000,000	100,000	10	*			
22	Calaveras, G.	Cal.	500,000	500,000	1	*			
23	Carisa, G.	Wy	500,000	100,000	5	*			
24	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	*			
25	Cashier, G. S.	Colo.	500,000	250,000	2	*			
26	Cen. Contin'l, G.S.L.	C.&A	2,000,000	200,000	10	*			
27	Charles Dickens, G.S.	Idah.	1,250,000	250,000	5	*			
28	Cherokee, G.	Cal.	1,500,000	150,000	10				
29	Chollar, S.	Nev.	11,200,000	112,000	100	1,264,000	July	1888	.50
30	Cinnamon Mt., G.S.	Colo.	750,000	150,000	5				
31	Cleveland, T.	Dak.	1,000,000	500,000	2	*			
32	Comstock, G. S.	Nev.	10,000,000	100,000	100	30,000	Mar.	1887	.15
33	Con. Imperial, G. S.	Nev.	5,000,000	50,000	100	1,175,000	Sept	1887	.25
34	Con. Pacific, G.	Cal.	6,000 000	60,000	100	177,000	Sept	1887	.10
35	Cons. Silver, S.	Mo.	2,500,000	250,000	10				
36	Courtlandt	Colo.	500,000	50,000	10				
37	Crescent, S. L.	Colo.	3,000,000	300,000	10	*			
38	Crocker, S.	Ariz.	10,000,000	100,000	100	105,000	Feb.	1888	.20
39	Crowell, G.	N. C.	500,000	500,000	1				
40	Dahlonega, G.	Ga.	250,000	250,000	1	*			
41	Dandy, S.	Colo.	5,000,000	500,000	10				
42	Dardanelles, G.	Cal.	1,000,000	100,000	10				
43	Decatur, S.	Colo.	1,500,000	300,000	5	*			
44	Denver City, S. L.	Colo.	5,000,000	500,000	10	*			
45	Denver Gold, G.	Colo.	300,000	60,000	5				
46	Durango, G.	Colo.	500,000	500,000	1	*			
47	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar.	1886	1.00
48	El Cristo, G. S.	U.S.C	1,000,000	500,000	2				
49	El Dorado, G.	Cal.	1,000,000	250,000	4	*			
50	El Talento, G.	U.S.C	1,000,000	500,000	2				
51	Empire, S.	Utah	10,000,000	100,000	100				
52	Eureka Tunnel, S. L.	Nev.	10,000,000	100,000	100	*			
53	Exchequer	Nev.	10,000,000	100,000	100	770,000	Feb.	1888	.20
54	Found Treasure, G.S.	Nev.	10,000,000	100,000	100	18,000	July	1888	.06
55	Gogebic I. Syn., I.	Wis.	5,600,000	200,000	25				
56	Gold Cup, S.	Colo.	500,000	500,000	1	*			
57	Golden Era, S.	Mon.	2 000,000	200,000	10	*			
58	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
59	Gold Rock, G.	Cal.	1,000,000	500,000	2	*			
60	Goodshaw, G.	Cal.	10,000,000	100,000	100	*			
61	Grand Belt, C.	Tex.	12,000,000	120,000	100				
62	Grand Duke	Colo.	800,000	80,000	10				
63	Great Remance, G.	U.S.C	1,000,000	500,000	2	*			
64	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*			
65	Gregory Con., G.	Mon	3,000,000	300,000	10				
66	Harlem M.& M.Co, G.	Cal.	1 000,00	200,000	5				
67	Head Cent. & Tr. S. G.	Ariz.	10,000,000	100,000	100				
68	Hector, G.	Cal.	1,500,000	300,000	5				
69	Highland, C.	Mich	500,000	25,000	25				
70	Hollywood	Cal.	200,000	100,000	2				
71	Hortense, S.	Colo.	2,000,000	200,000	10				
72	Huron, C.	Mich	1,000,000	40,000	25	280,000	May	1887	3 00
73	Iron Gold & Silver, S.	N. M	2,000,000	200,000	10	*			
74	Ironton, I.	Wis.	1,000,000	40,000	25				
75	Iroquois, C.	Mich	1,250,000	50,000	25				
76	J. D. Reymert	Ariz	10,000,000	100,000	100	*			
77	Julia Cons., G. S.	Nev.	11,000,000	110,000	100	1,650,000	Apl.	1887	.10
78	Kearsarge, C.	Mich	1 250,000	50,000	25	190,000	Oct.	1887	1.00
79	Laclede	N. M.	2,000,000	200,000	10	*			
80	Lacrosse, G.	Colo.	1 000,000	100,000	10	*			
81	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*			
82	Lochiel, S.	N. M.	2,000,000	200,000	10	*			
83	Lucerne, S.	Colo.	5,000,000	500,000	10	*			
84	Mammoth Bar., G.	Cal.	10,000,000	100,000	100	50,000	Dec.	1881	
85	May Belle, G.	Cal.	10,000,000	100,000	100	84,000	Mar.	1884	.15
86	Mayflower Gravel.	Cal.	1,000,000	100,000	10	375,000	July	1888	.50
87	Medora, G.	Dak.	250,000	250,000	1				
88	Mexican, G. S.	Nev.	10,000,000	100,000	100	2,725,760	Aug	1888	.25
89	Middle Bar G.	Cal.	400,000	200,000	2	*			
90	Mike & Starr, S. L.	Colo.	1,000,000	200,000	5	*			
91	Monitor, G.	Colo.	100,000	100,000	1	*			
92	Moose Silver, S.	Colo.	3,000,000	300,000	10				
93	Native, C.	Mich	1,000,000	40,000	25				
94	Neath, G.	Colo.	1,000,000	100,000	10				
95	Nevada Queen, S.	Nev	10,000,000	100,000	100	130,000	Dec.	1887	.50
96	New Germany, G.	N. S.	100,000	100,000	1	*			
97	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	*			
98	North Standard, G.	Cal.	10,000,000	100,000	100	20,000	Nov		
99	Noonday	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
100	Oneida Chief, G.	Cal.	500,000	125,000	4	*			
101	Oriental & Miller, S.	Nev.	10,000,000	400,000	10				
102	Osceola, G.	Nev.	5,000,000	50,000	25	*			
103	Overman, G. S.	Nev.	11,520,000	115,200	100	3,737,180	Aug.	1887	.25
104	Park, S.	Utah	2,000,000	200,000	100				
105	Peer, S.	Ariz.	10,000,000	100,000	10	125,000	Nov.	1886	.10
106	Peerless, S.	Ariz.	10,000,000	100,000	100	345,000	Apl.	1888	.25
107	Phœnix	Ariz.	500,000	500,000	100				
108	Phœnix, G. S.	Ark.	5,000,000	200,000	1	*			
109	Phœnix Lead, S. L.	Colo.	100,000	100,000	25	*			
110	Pilgrim, G.	Cal.	600,000	300,000	1	*			
111	Potosi, S.	Nev.	11,200,000	112,000	2	1,349,600	July	1885	.50
112	Proustite, S.	Idah	250,000	250,000	100	*			
113	Puritan S. G.	Colo.	1,500,000	150,000	1	*			
114	Quincy	Colo.	3,000,000	300,000	10				
115	Rappahannock, G.S.	Va.	250,000	250,000	10	*			
116	Red Elephant, S.	Colo.	500,000	500,000	1	*			
117	Ropes, G. S.	Mich	2,000,000	80,000	1	103,200	July	1887	.50
118	Russell, G.	N. C.	1,500,000	300,000	25				
119	Sampson, G. S. L.	Utah	10,000,000	100,000	5	288,157	July	1888	1.00
120	San Sebastian, G.	San.S	1,600,000	320,000	5	*			
121	Santiago, G.	U.S.C	400,000	1,200,000	2	*			
122	Security, S.	Colo.	10,000,000	1,000,000	10				
123	Sheridan	N.M.	2,000,000	200,000	10				
124	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*			
125	South Bulwer, G.	Cal.	10,000,000	100,000	100	100,000	May	1881	.25
126	South Hite	Cal.	10,000,000	100,000	100	195,000	Jan.	1885	.05
127	South Pacific	Cal.	500,000	100,000	5				
128	Stanislaus, G.	Cal.	2,000,000	200,000	10				
129	State Line, S.	Nev.	250,000	250,000	1				
130	St. Kevin, G. S.	Colo.	100,000	100,000	1	*			
131	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*			
132	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10				
133	St.L.& St.Felipe, G. S.	Mex.	1,500,000	150,000	10				
134	St L. & Sonora, G.S.	Mex.	1,500,000	150,000	10				
135	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*			
136	Sunday Lake, I.	Mich	1,250,000	50,000	25				
137	Sullivan, G. S. L.	Me.	500,000	100,000	5	125,000	Dec.	1882	.25
138	Sutro Tunnel.	Nev.	20,000,000	2,000,000	10				
139	Taylor-Plumas, G.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.03
140	Tioga Cons., G.	Cal.	10,000,000	100,000	10	295,000	May	1888	.10
141	Tornado Cons. G. S.	Nev.	100,000	100,000	1	*			
142	Tortilita, G. S.	Ariz	1,000,000	100,000	2	*			
143	Tuscarora, S.	Nev.	10,000,000	500,000	100	110,000	Oct.	1881	.15
144	Union Con., G. S.	Nev.	10,000,000	100,000	100	2,185,000	Nov	1887	.50
145	Utah, S.	Nev.	10,000,000	100,000	100	95,000	May	1888	.25
146	Washington, C.	Mich	1,000,000	40,000	25				
147	West Granite Mt., S.	Mon.	5,000,000	500,000	10	*			
148	Zelaya, G. S.	C. A.	600,000	300,000	2	*			
149									

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in Aug., 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia, $21,390,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ 1,000,000.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Sept 1. H.	Sept 1. L.	Sept 3 H.	Sept 3 L.	Sept 4 H.	Sept 4 L.	Sept. 5. H	Sept. 5. L.	Sept 6. H.	Sept 6. L.	Sept. 7 H.	Sept. 7 L.	SALES.
Adams, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Alice, Mont	....	....	....	....	....	....	....	....	.50	.49	.55	.50	1,300
Argenta, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Bassick, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Belcher, Nev	....	....	....	....	....	....	....	....	4.15	....	4 50	....	200
Bie Isle, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Bodie Cons., Cal	....	....	....	....	1.55	1.50	1.75	....	1.50	....	1 60	....	1,800
Breece, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Bu wer, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Caledonia, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Central, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Chollar, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Chrysolite, Colo	....	....	....	....	....	....	....	....	.40	....	....	....	200
Colorado Cent'l, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Cal. & Va., Nev.	9.00	....	....	....	....	....	9.63	9.00	....	....	9 38	....	610
Crown Point, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Deadwood, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo	....	....	....	....	....	....	....	....	.85	....	....	....	200
Eureka Cons., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Fa ner de Smet, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Freeland, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Gould & Curry, Nev	2 70	....	....	....	....	....	....	....	2 65	....	2 80	....	750
Grand Prize, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Green Mountain, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Hale & Norcross, Nev	4.20	....	....	....	....	....	4.40	....	....	....	....	....	350
Holyoke, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....
Homestake, Dak	....	....	....	....	....	....	11.70	....	....	....	....	....	35
Horn-Silver, Ut	....	....	....	....	....	....	....	....	.90	....	....	....	300
Iron Hill, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Iron Silver, Colo	....	....	....	....	....	....	....	....	3.3	....	....	....	200
Leadville C., Colo	....	....	....	....	....	....	....	....	.25	.14	....	....	1,000
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Mono, Cal	....	....	....	....	....	....	....	....	....	....	1.10	....	500
Mount Diablo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Navajo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
North Belle Isle, Nev	....	....	....	....	....	....	....	....	2.50	....	3.00	....	200
Ontario, Ut	....	....	....	....	3 25	32.50	33.00	32.00	33.25	....	....	....	135
Ophir, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Plutus, Colo	1.05	1.00	....	....	1.05	1.00	....	....	1.05	1.00	1.00	....	2,900
Plymouth, Cal	....	....	....	....	....	....	....	....	8.00	....	....	....	100
Quicksilver Pref., Cal	....	....	....	....	35 38	....	36.50	....	36.00	....	....	....	900
" Com., Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Robinson Cons. Colo	....	....	....	....	....	....	.75	....	....	.95	....	....	510
Savage, Nev	....	....	....	....	....	....	2 90	....	....	3.00	....	....	250
Sierra Nevada, Nev	....	....	....	....	....	....	3.25	....	....	....	....	....	2 0
Silver King, Ariz	2 40	....	....	....	1.90	....	2.20	2.00	....	....	2 10	....	1,300
Silver Mg. of L. V	....	....	....	....	....	....	....	....	....	....	....	....	....
Small Hopes, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Standard, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Stormont, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Yellow Jacket, Nev	....	....	....	....	....	....	3 60	....	4.10	3.85	4 10	....	500

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY	Sept. 1 H.	Sept. 1 L.	Sept 3 H.	Sept 3 L.	Sept. 4. H.	Sept. 4. L.	Sept. 5 H.	Sept. 5 L.	Sept. 6 H.	Sept. 6 L.	Sept 7 H.	Sept 7 L.	SALES
Alta, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Amador, Cal	2.00	....	....	....	3.00	2.60	3.00	....	3 00	....	3.00	2.90	1,900
Am'can Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Astoria, Cal	.30	....	....	....	30	....	30	....	.30	....	.28	....	7,000
Barcelona, Nev	1.00	.90	....	....	.85	....	....	....	.85	....	....	....	700
Best & Belcher, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Brunswick, Cal	.16	.15	....	....	....	....	.35	.20	23	.20	.25	.24	15.7 0
Buffalo Iron Min'g	8.25	....	....	....	....	....	....	....	....	....	....	8.25	8 13 300
Bullion, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Carupano, Venes	....	....	....	....	....	....	....	....	....	....	....	....	....
Cashier, Colo	....	....	....	....	....	....	.10	....	.11	.10	.11	.10	6,800
Castle Creek, Id	....	....	....	....	....	....	....	....	....	....	....	....	....
Cleveland, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Confidence, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	.39	....	1,500
Con Pacific	....	....	....	....	....	....	....	....	....	....	....	....	....
Denver City, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Eastern Oregon	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, U. S. Col	.99	....	....	....	....	....	....	....	....	....	.99	....	600
Exchequer, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Found Treas'e, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Hector, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Hollywood, Cal	.39	....	....	....	.39	....	....	....	....	....	.39	....	1,500
Huron, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Julia, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Kingst'n & Pemb'ke	....	....	....	....	....	....	....	2.75	....	2.50	....	....	400
Kossuth, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Lacrosse, Colo	....	....	....	....	....	....	....	....	.10	.09	....	....	1,000
Lee Basin, Colo	.75	....	....	....	....	....	.70	....	.70	....	.72	....	900
Mexican, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Middle Bar, Cal	....	....	....	....	....	....	....	....	....	....	.45	....	2,300
Monitor, Colo	....	....	....	....	....	....	....	.11	.10	....	....	.46	.45 1,300
N'th Standard, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Oriental & Miller	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix Lead, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Ark	....	....	....	....	....	....	....	....	....	....	....	....	....
Potosi, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Proustite, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....
Rappahann'k, Va	.11	....	....	....	....	....	....	.11	....	.11	....	.11	2,300
San Sebastian, S'nS	....	....	....	....	....	....	....	....	....	....	....	....	....
Santiago, U. S. Col	3.90	....	....	....	3.90	....	3.90	....	3.95	....	3.95	3.90	1,100
*Security, Colo	....	....	....	....	.10	....	.10	....	....	....	....	....	400
Shoshone, Idaho	.13	....	....	....	....	....	....	....	....	....	.13	....	1,800
Silver Cliff, Colo	....	....	....	....	....	....	.07	....	....	....	....	....	500
Silver Cord, Colo	....	....	....	....	.60	....	.55	.54	.53	.52	....	....	4,900
Silver Queen, Ariz	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutro Tunnel, Nev	....	....	....	....	.11	....	....	....	.12	.10	.11	....	5,300
" Trust Cert.	....	....	....	....	....	....	....	....	64 00	....	65.00	....	1,100
Sutter Creek, Cal	1.20	1.15	....	....	1.20	1.15	1.20	1.15	1.20	1.15	1.15	1.10	3,200
Taylor Plumas, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Tornado, Nev	....	....	....	....	....	....	....	....	....	....	40	....	500
Union Cons., Nev	....	....	....	....	....	....	2.90	....	3 25	....	3 45	....	600
Utah, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....

Dealt in at the New York Stock Ex. Unlisted Securities †Assessment unpaid. Dividend shares sold, 14,540. Non-dividend shares sold, 62,000. Total New York, 76,540.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY	Aug. 31.		Sept. 1.		Sept. 3.†		Sept. 4.		Sept. 5		Sept 6.		SALES.
Atlantic, Mich	17.00	16 63	....	....	....	....	....	....	17.50	17.00	18.13	18.00	1,030
Bodie, Cal	....	....	....	....	....	....	....	....	1.63	....	1 63	....	1.000
Bonanza Developm't	1.69	....	1.63	1.50	....	....	....	....	....	....	....	....	....
Bost. & Mont., Copper	50.50	50 00	50 50	5.25	....	....	52 00	50.25	53.00	52.00	53.75	52.75	3,190
Breece, Colo	32½	....	32½	....	....	....	....	....	....	....	....	....	500
Calumet & Hecla	....	....	....	....	....	....	275	265	285	275	285	280	534
Catalpa, Colo	....	....	....	....	....	....	.22	....	....	....	....	....	100
Central, Mich	....	....	....	....	....	....	19.00	....	....	....	....	....	130
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Cal & Va, Nev	8.75	....	....	....	....	....	....	....	....	....	....	....	40
Dunkin, Colo	....	....	.85	.82½	....	....	.8	....	.85	.80	.85	.83	1,350
Enterprise	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich	20.75	20.50	20.75	20.50	....	....	21.38	20.75	21.50	21.00	21.25	20.00	2,190
Hale & Norcross, Nev	....	....	....	....	....	....	....	....	....	....	4.40	....	100
Honorine, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Mono, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Napa, Cal	2 00	....	....	....	....	....	....	....	....	....	1.88	....	250
Osceola, Mich	21.00	20.88	21 50	21.00	....	....	23.00	21.00	23 00	....	22 75	22.50	1,175
Pewabic, Mich	3 50	....	3 50	....	....	....	....	....	3.63	....	3 75	....	660
Quincy, Mich	....	....	....	....	....	....	75.00	....	76 00	75.00	78.00	....	236
Ridge, Mich	1.63	....	1.63	....	....	....	2.00	1.75	2.00	....	....	....	1,705
Sierra Nev., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver King, Ariz	....	....	....	....	....	....	....	....	....	....	2.00	....	100
Standard, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Tamarack, Mich	174	173½	174	173⅜	....	....	177½	174	178½	178	184	181	200

NAME OF COMPANY.	Aug 31.		Sept. 1.		Sept. 3†		Sept. 4.		Sept. 5.		Sept. 6.		SALES
Allouez, Mich	3.13	....	3.25	....	....	....	....	....	*3.50	....	3.63	....	1,850
Arnold, Mich	....	....	....	....	....	....	....	....	.25	....	27½	.25	.30 2,900
Aztec, Mich	....	....	....	....	....	....	....	....	.13	....	....	....	200
Brunswick, Cal	....	....	....	.16	....	....	....	....	....	....	....	....	400
Canada	....	....	....	....	....	....	....	....	....	....	....	....	....
Contentment	....	....	....	....	....	....	....	....	....	....	....	....	....
Crescent, Colo	....	....	....	....	....	....	....	....	....	....	.10	....	500
Cusi, N. Mex	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, U.S. Col	....	....	....	....	....	....	....	....	....	....	....	....	....
Everett	....	....	....	....	....	....	....	....	....	....	.25	....	200
Hanover, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Humboldt, Mich	.15	....	.17	....	....	....	....	....	....	....	....	....	400
Hungarian	.20	....	....	....	....	....	....	....	....	....	....	....	100
Huron, Mich	5.75	5.78	5.88	5.50	....	....	5.75	5.50	6 00	5.75	5.50	....	920
Kearsarge, Mich	8.75	8.25	8.75	8.63	....	....	9.13	8 75	9 50	9.13	9.25	....	4,120
Mesnard, Mich	.50	....	....	....	....	....	....	....	....	....	....	....	500
National, Mich	4.50	4.25	4.88	4.38	....	....	5.75	5.25	6.25	5.38	5.13	....	3,715
Native, Mich	....	....	4.63	....	....	....	....	....	....	....	....	....	100
Oriental & M., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Rappahannock, Va	....	....	.11	....	....	....	....	.10	....	.10	....	.10	1,300
Royal, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Security, Colo	....	....	....	....	....	....	....	.10	....	....	....	....	100
Shoshone Idaho	.13	....	.13	....	....	....	....	.13	....	.12	....	.12	1,100
South Side, Mich	....	....	....	....	....	....	....	.25	....	....	....	....	500
Sullivan	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutro Tunnel, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Taylor Plumas, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington	....	....	....	....	....	....	....	....	....	....	....	....	....
Winthrop, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....

* Assessment paid. † Labor Day. Boston: Dividend shares sold, 14,285. Non-dividend shares sold, 18,705. Total Boston, 33,090.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh're.	Sept. 1. H.	Sept. 1. L.	Sept. 3.‡ H.	Sept. 3.‡ L.	Sept. 4. H.	Sept. 4. L.	Sept. 5. H.	Sept. 5. L.	Sept. 6 H.	Sept. 6 L.	Sept. 7. H.	Sept. 7. L.	Sales.
Barclay Coal	....	†16	....	†16	....	†16	....	†16	....	....	....	....	....	....
Buck Mt. Coal	....	*4	....	*4	....	....	....	....	....	*7	....	....	....	....
Ches. & O. RR	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Chic. & Ind. Coal RR	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Col. & Hocking Coal	100	....	....	....	....	23⅞	23¼	25	24½	24¾	....	25	24¾	1,550
Col., C. & I	100	38⅛	36¼	....	....	38½	38¼	38½	38	37⅝	37½	38	....	4,710
Connellsville Gas Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Consol. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & H. C	100	118	....	....	....	119⅛	118⅛	119⅛	118¼	119⅛	118⅜	119¼	118⅛	4,394
D., L. & W. RR	50	143⅜	142¼	....	....	144½	143⅝	144⅝	143⅞	145	144	144½	143¼	107,240
Hocking Valley	100	29⅞	29⅜	....	....	31	30	32¼	31¼	32¾	31¾	32	31½	8,495
Hunt. & Broad Top	....	....	....	....	....	19½	18¾	20⅞	19⅝	21	....	....	....	2,761
Do. pref	....	43⅜	....	44	43¼	44⅜	44⅛	45	44¼	45½	44¾	....	....	3 409
Lehigh C. & N	50	50¼	....	50¾	....	51	50¾	51⅛	50⅞	....	....	....	....	1,643
Lehigh & W. B. Coal	....	....	....	....	....	21½	....	22	21⅝	22	....	....	....	400
Lehigh Valley RR	50	55½	55⅝	56¼	55¾	56	55¾	56	55¾	56	55⅞	....	....	2,973
Mahoning Coal RR	100	....	....	....	....	48	....	50	48	....	....	....	....	350
Do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Marshall Con. Coal	100	13	....	....	....	13¼	13	....	....	....	....	....	....	500
Maryland Coal	100	....	....	....	....	14	....	....	....	14	....	....	....	105
Montauk Coal	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Morris & Essex	100	....	....	....	....	....	....	....	....	....	....	145½	145	44
New Central Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
N. J. C. RR	50	89⅝	....	....	....	90⅛	89¼	90¾	89⅞	91¼	90⅜	91⅛	90	25.233
N. Y. & S. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Y., Susq. & Western	100	....	....	....	....	10	9⅞	9⅝	....	10¼	9⅞	10⅜	10	4 229
Do. pref	100	....	....	....	....	35	34⅝	34⅝	34⅝	35½	34¾	35	34⅝	5 325
N. Y. & Perry C. & I	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Norfolk & Western R.R.	100	19⅛	19⅜	....	....	20⅛	19⅞	20⅝	20¼	20¼	20¼	21½	20¾	4 775
Do. pref	50	53¾	53¼	....	....	55¼	54⅝	56¼	54⅞	56¼	55½	57⅜	55½	11,916
Penn. Coal	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. RR	50	54¾	54⅝	55	54⅞	55	54¾	55⅛	55	55	54⅞	....	....	4 096
‡Ph. & R. RR.**	50	52⅝	52	....	....	54¼	53	54⅝	53⅞	54⅝	53½	54⅝	53¼	237,075
Tennessee C. & I. Co	100	28¾	....	....	....	29	28⅝	28⅞	28¾	29¼	28½	32	29	17,744
Westmoreland Coal	100	†68	....	....	....	†68	....	....	....	....	....	....	....	....
Whitebreast Fuel Co	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wyoming Vall'y Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	....

*Bid. †Asked. ‡Labor Day observed in New York only.
**Of the sales of this stock, 59,745 were in Philadelphia, and 177,330 in New York. Total sales, 448,967.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS. Aug. 31.	Sept. 1.	Sept. 3.	Sept. 4.	Sept. 5.	Sept. 6.
Alpha	....	....	....	....	....	....
Alta	1.40	....	....	1.50	1.55	....
Belcher	....	....	....	....	....	....
Belle Isle	....	....	....	....	....	....
Best & Bel	3.10	....	....	3.15	3 20	....
Bodie	1.50	....	....	1.45	1.50	....
Bulwer	.65	....	....	.70	....	....
Chollar	2.50	....	....	2.50	2.50	....
C'm'weal'h	....	....	....	....	....	....
Con. C. & V	8.50	....	....	8.50	9.00	....
Con. Pac	....	....	....	....	....	....
Crown Pt	3.55	....	....	3.65	3.75	....
Eureka C	3.00	....	....	....	....	....
Gould & C	2.45	....	....	2.60	2.60	....
Grd. Prize	.95	....	....	....	....	....
Hale & N	4.05	....	....	4.15	4.10	....
Mexican	3.00	....	....	3.10	3.10	....
Mono	1.00	....	....	1.00	....	....
Mt Diablo	....	....	....	....	....	....
Navajo	....	....	....	1.50	1.50	....
Nev. Queen	4.45	....	....	4.50	....	....
N. Belle I	....	....	....	2.55	2.55	....
Ophir	5.37½	....	....	5.62½	5.62½	....
Potosi	2.40	....	....	2.45	2 40	....
Savage	2.05	....	....	2.15	2.65	....
Scorpion	....	....	....	....	....	....
Sierra Nev	2.95	....	....	3.00	2.95	....
Sutro Tun	....	....	....	....	....	....
Tip Top	....	....	....	....	....	....
Union Con	2.95	....	....	3.05	3.00	....
Utah	1.10	....	....	1.20	1.10	....
Yellow Jkt	3 25	....	....	3.30	3.60	....

considering the high price of the stock, at from $36@$36.50.

Some attention has been directed to Bodie Consolidated from $1.50@$1.75. Mono shows one sale at $1.10.

Amador shows continued strength and a further advance, going from $2.60@$3. Astoria declined from 30@28c. Middle Bar was neglected, and no sales were made until yesterday and to-day, when it sold off from 45@44c. Hollywood was quiet at 39c. Sutter Creek was strong at from $1.10@$1.20.

The Directors of the Hale & Norcross Mining Company, who usually meet at the end of each month to declare a dividend, held no meeting on the 31st ult., and no dividend will be paid this month. The stock shows few transactions in this market and sold this week at from $4.20@$4.40. Consolidated California & Virginia was firm at from $9@$9.63. Union Consolidated advanced from $2.90@$3.45. Yellow Jacket from $3.60@$4.10. Gould & Curry was quiet at from $2.65@$2.80. Belcher at from $4.15@$4.50.

Good reports are being received from the mines of the Tuscarora district; but little is doing in the stocks. Navajo and Belle Isle show no sale, North Belle Isle a few at from $2.50@$3.00, and Tornado one at 40c.

Barcelona shows but a small business and declined from $1@85c.

Sutro Tunnel is quoted at from 10@12c., and the Trust Certificates are firm at from $64@$65.

Kingston and Pembroke is quiet, selling at from $2.50@$2.75.

The manipulators are doing little with El Cristo, which is quoted at 97@99c.

Santiago continues to be firm at from $3.90@$3.95.

Rappahanock remains unchanged at 10@11c.

Deadwood-Terra, Caledonia, Father de Smet and Iron Hill are neglected in this market, and Homestake shows only one sale at $11.

Silver King declined from $2.40 to $1.90, but later advanced again to $2.20, and to-day sold at $2.10.

Nothing was done in Proustite. Shoshone was quoted at 13c.

Considerable business is still done in Plutus, which is firm at $1 to $1.05. Robinson Consolidated advanced from 75 to 95c. Leadville sold at 24@25c.; 200 shares of Iron Silver changed hands at $3.30. Dunkin at 85c. Chrysolite at 40c. Silver Cord showed large sales, but declined from 60@52c. Security appeared on the list, after an absence of many weeks, at 10c. Monitor was quoted at 10@11c. Lee Basin at from 70@75c. Lacrosse at 9@10c. Cashier at 10@11c.

Buffalo Iron Mining of Wisconsin, dealt in among the unlisted securities on the New York Stock Exchange, sold at from $8.13@$8.25.

Alice was dealt in to the extent of 1300 shares at from 49@55c.

Pipe Line Certificates.

Messrs. Watson & Gibson, brokers, report for the week as follows:

The market the past week was broken off three and a half cents from the extreme top on the rumor that the producers would begin operations in the field on an increased scale on the expiration of the agreement to shut down for one year. Our information, however, is that the compact will be renewed on a modified scale, and we feel confident in dollar oil very soon. We have been predicting this for three weeks, and yesterday the market rose from 91⅞@96c.

Refined is 7¾, but we think it will advance to 8 cents before many days. Stocks of refined in Europe are light, and they must soon come in as free buyers. Ocean freight rates are nearly twice as high as last year.

Lima, Ohio, oil is inferior to Pennsylvania, and is not a good delivery, but its output is increasing, the average daily production there in August being 31,697 barrels.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 1.....	92¾c.	93⅛c.	92⅝c.	93⅜c.	621,000
*3.....	....	....	....	....	....
4.....	93¾	95⅝	92⅞	94⅝	1,441.000
5.....	94⅜	95⅛	93⅜	94⅝	734,000
6.....	94¼	94¼	92¾	92¾	724,000
7.....	92½	96	92	96	1,220.000
Total sales in barrels.....					4,740,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 1.....	92¾c.	93⅛c.	92⅛c.	93⅜c.	781,000
*3.....	....	....	....	....	....
4.....	93⅜	95⅝	92⅞	94⅝	2,098,000
5.....	94⅜	95⅛	93⅜	94⅝	660,000
6.....	94⅜	94⅝	92¼	92¾	1.037,000
7.....	92½	96	91⅞	96	1,880,000
Total sales in barrels.....					6,456,000

*Labor Day.

Meetings.

Consolidated Electric Light Company, No. 510 West 23d street, New York city, September 19th, at twelve o'clock noon.

Lake Erie and Western Railroad Company, Bloomington, Ill., October 3d.

Rappahannock Gold Mining Company, Room 414, No. 60 Broadway, September 17th, at four o'clock P.M. Special meeting for transaction of important business.

Sawyer-Man Electric Company, 510 West 23d street, New York city, September 13th, at twelve o'clock noon.

Dividends.

Poorman Mining Company, of Boulder County, Colo., dividend No. 2, ten cents per share, or $5000, payable September 15th.

New York & Honduras Rosario Mining Company, ten cents per share, payable September 27th, at 347-349 Produce Exchange, New York City.

Assessments.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am'nt per share.
Anchor, Utah.....	7	July 31	Sept. 3	Sept.22	.10
Atlas, Dak	....	July 11	Aug. 15	Oct. 10	.001¼
Baker Divide, Cal...	16	Aug. 13	Sept.17	Oct. 8	.25
Beaver Oil, Dak.....	1	July 23	Sept.11	Sept.28	.001
Belcher, Nev	35	July 18	Aug. 22	Sept.12	.50
Bullion, Nev.	34	Aug. 4	Sept. 7	Sept.24	.50
Chollar, Nev	25	July 20	Aug.23	Sept.11	.50
Deer Mt., Dak.....	2	July 27	Sept. 3	Sept.22	.001½
Eagle Oil, Dak	2	June 8	Sept. 1	Sept.20	.00½
El Dorado, Dak	4	Aug.17	Sept.19	Oct. 9	.001
Found Treasure, Nev	3	July 12	Aug.17	Sept. 7	.06
Gibraltar Cons., Cal.	21	June 9	Aug. 9	Sept.10	.20
Golden Fleece, Cal..	13	July 31	Sept. 8	Oct. 1	4.00
Hartshorn, Dak.....	2	Aug. 1	Sept 4	Sept.20	.005
Keyes Nev	2	July 19	Aug.23	Sept.24	.50
Lady Wash., Nev...	7	Aug.21	Sept.26	Oct. 16	.25
Loami, Cal	....	July 30	Sept.15	Oct. 1	.01
Lockport Dak.....	4	Aug. 4	Sept. 5	Sept.22	.002
Locomotive, Nev ...	3	Aug.21	Sept.26	Oct. 16	.25
Live Oak Drift	10	Aug.20	Sept.27	Oct. 19	.05
Lone Jack, Cal.....	2	July 11	Aug.16	Sept. 7	.10
Mayflower, Cal.....	42	July 31	Sept. 3	Sept.25	.50
Mexican, Nev.....	36	Aug. 9	Sept.12	Oct. 3	.25
Morning Star..	2	July 26	Aug.27	Sept.11	.01
Montreal, Utah	1	Aug.17	Oct. 1	Oct. 20	.01
Navajo Queen, Nev..	1	Aug. 3	Sept. 5	Sept.24	.20
New Era, Dak.....	4	Aug. 9	Sept.10	Sept.26	.01
Pondere, Cal.....	1	Aug.10	Sept.18	Oct. 10	.05
Sampson, Utah.....	....	July 5	Aug. 7	Sept 7	1 00
Savage, Nev	70	Aug. 2	Sept. 5	Sept.25	.50
Scott Bar, Cal.....	1	July 26	Sept. 3	Sept.20	.10
Spring Valley, Cal...	3	July 17	Aug. 25	Sept.24	.10
Virginia Creek, Cal..	6	Aug.29	Oct. 9	Oct. 29	06

Boston Mining Stocks. Sept. 6.

[From our Special Correspondent.]

The market for copper stocks the past week has been very active, and prices are on the upward march, and he who is fortunate enough to catch on will, no doubt, make a deal of money in the near future. So far, the speculation has been in the producing and dividend-paying mines, but it is gradually widening, and will, no doubt, in time include all classes of the copper stocks, and we anticipate a lively market when the steam is fairly on.

Calumet & Hecla took one of its famous jumps from $265 to $285, and on a very small amount of stock the latter price brought out a 100 share lot, which, no doubt, paid the seller a very large profit. It is freely predicted that the stock will sell at $300 before the close of 1888. There is a rumor that the mine is to be divided, and that both mines will sell as high as the present price for one. Boston & Montana advanced from $50 to $53¾, with a great deal of stock marketed, and it is in active demand even at the advanced price, and $80 is predicted for it ere the year closes. Franklin has been fairly active, but has not scored much of an advance. It sold up to $21¼, but declined to-day to $20 and closed at $20¼, which is about last week's price.

Quincy sold at $75@$76, about 200 shares, but $78 was bid to-day and none offered at less than $80.

Osceola sold up to $23, but did not hold the advance, and was offered at $22 this afternoon and no bids.

Tamarack advanced from $174 to $186, but at the advance there was little stock offered, and it will no doubt go much higher.

Atlantic sold at $17 in the early dealings, and advanced to $18¾ and closed strong at $18⅛ bid.

Kearsarge sold up to $9⅝@$9¾, an advance of $1 per share, and was fairly strong at $9½ bid.

A single sale of Central is noted at $19, which is $1 lower than last sale.

National and Huron have both been active; the former advanced from $4@$6¼ and the latter from $5⅝@$6.

Allouez was also in good demand at $3⅛@$3¾, with sales at both prices.

Ridge is growing in favor and sold at $2, and was in demand at that price.

Pewabic advanced from $3.25 to $3.75 on moderate transactions.

Arnold sold at 25@30c., and South Side at 25c. There is a good demand for this class of stocks, with but few in the market for sale, and higher prices are sure to come.

Bonanza sold at $1⅝@$1 11/16, and Napa Quicksilver at $2.

Silver stocks continue dull and neglected, the speculation all running for coppers. Dunkin steady at 80@85c. Breece in demand at 30c. bid, 35c. asked. Catalpa and Crescent dull at 20c. for former and 10c. for the latter.

3 P.M.—The market closed a shade off from the highest prices of the week, but the tendency is all one way, viz., higher prices.

LATEST PRICES.

(*By Telegraph*)—September 7th, 1 P.M.—Market active; Allouez, $3.50; Calumet & Hecla, $284; Kearsarge, $8.87½; Boston & Montana, $53 asked; Tamarack, $185; National, $5; Franklin, $19⅝.