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CONTENTS.

THE political question has ceased to be a factor in the lead market, for the price of lead in this city is now far below the importing price, even should the duty be reduced to 1½ cents instead of 2 cents per pound, as it now stands. The price of Spanish lead in London during the week was £12 7s. 6d. per ton of 2240 pounds, which would be equivalent to about 4¼ cents per pound without counting commission. So that even if the duty were reduced to 1½ cents as proposed in the Mills bill, lead could not be laid down in New York at 4¼ cents, while the domestic lead sold during the week at 3·65c.

It is true lead has been lower in London than it is at present, as shown in the following yearly averages, but only during 1884 and 1885:

	£ s.		£ s.
1880	16 5	1884	11 10
1881	15 5	1885	11 0
1882	14 15	1886	12 19
1883	13 12	1887	

At £11 per ton the cost laid down here would be about 4⅛ cents, with the present duty, or say 3·75c. with the proposed 1½c. duty. It is, therefore, home, not foreign, competition that is now the danger of the lead market, and this, of course, is increased by the free entry of lead in silver-bearing ores.

THE COAL PRODUCTION OF THE UNITED STATES IN 1887.

On another page we publish the statistics of coal production in 1887, as collected by Mr. CHARLES A. ASHBURNER for the United States Geological Survey. These figures are very remarkable, showing an output of no less than 123,965,255 tons of 2000 pounds, as compared with 107,682,209 tons in 1886. A large increase was expected, but it was not thought to have amounted to any thing like 16,283,046 tons, or more than 15 per cent. It will not be many years until this country will surpass England in its coal output.

We do not know the data on which the average value at the mines is based, but no doubt Mr. ASHBURNER, who is an experienced engineer, has given it with accuracy. It is evident that it includes royalty or ground rent. For convenience, we have reduced the figures to the average value per ton in each of the States. It will be seen how widely these values vary, Ohio standing first at 88 cents per ton, and Pennsylvania only 90 cents per ton for bituminous coal, while Virginia at 94 cents and West Virginia, 95c., due to the remarkably low cost of Pocahontas coal, tie Maryland at 95 cents per ton. All other States have an average cost exceeding $1 per ton. The average value at the mines of all our bituminous coal was only about $1.11 per net ton, a figure which will compare very favorably with the value at the mines in most foreign countries.

THE NOWELL ALASKAN BUBBLE BURST.

One of our Alaskan correspondents tells on another page that the great Nowell Alaskan bubble has burst.

It appears that twenty stamps of the eighty-stamp mill started up and crushed some 500 tons of rock, which are said to have contained little or no gold, as we stated was the case. Another correspondent says not 75 cents for the entire run. The very concentrates from the ore contained only a trace of gold, so that even Mr. THOS. S. NOWELL "has become thoroughly satisfied" that the ore is worthless.

It does not at all surprise us that he prefers remaining in Alaska to visiting Boston at present, for here his reception would probably be quite too warm. A correspondent suggests that "Boston send out and bring him back and make an example of him."

The ENGINEERING AND MINING JOURNAL has the satisfaction of having kept a good deal of money out of this sink, and in so doing has protected the good name of Alaska.

It is now always possible for investors to get reliable information from disinterested sources concerning any mining scheme, and if they exercised proper care in doing so, mining would become a far more profitable, and therefore popular, field for capital than it is while loaded down with so many bad or dishonest schemes.

STOCKS OF PIG-IRON IN GREAT BRITAIN AND THE UNITED STATES.

"Stocks unsold" are the greatest menace and danger to every market, and so long as they are very large there can be little hope for any permanent high prices.

In Great Britain the stocks of pig-iron in makers' hands and in stores have been growing rapidly of late years, and have now attained the enormous aggregate of 2,616,366 gross tons.

The following statistics, collected by the British Iron and Steel Institute, giving the stocks and consumption, are very suggestive, and bode ill for any large increase in prices; in fact, the tendency there is rather towards lower prices by reducing the cost of making iron through various economies, such as by increased output from furnaces, reduced consumption of fuel, utilization of the ammonia in blast-furnace gases, etc., so that prices which a few years ago would have been ruinous are now fairly remunerative, nevertheless at present prices there are only a few concerns in Great Britain that cover cost.

	Makers' stocks.	Stocks in stores.	Total stocks.
Cleveland	235,967	401,715	637,682
Scotland	285,332	942,708	1,228,040
West Coast	98,436	404,684	503,120
Other districts	247,524		247,524
Total	867,259	1,749,107	2,616,366

Consumption of Pig-Iron in 1887.

	Tons.
The total production of pig in 1887 was	7,441,927
Deduct increase of stock December 31st, 1887, over 1886	124,860
Leaves as the consumption of 1887, 7,317,067, against a consumption in 1886 of	6,731,328

The stocks of pig-iron in the United Kingdom, as a whole, at the end of 1887 were equal to 36 per cent, or 18·6 weeks consumption of that year. The stocks at the corresponding date of the five previous years are compared as follows:

	Great Britain.		United States.	
	Per cent.	Weeks' consumption.	Per cent.	Weeks' consumption.
1882	18·2	9·4	8·0	4·5
1883	21·1	10·4	10·0	5·7
1884	24·5	12·7	13·0	7·3
1885	35·0	18	9·0	4·9
1886	37·0	19·4	4·0	2·1
1887	36·0	18·6	4·7	2·6

In this country our total stock of unsold pig-iron at the close of 1887

was 338,142 net tons, or about sufficient for only 2·6 weeks' supply; yet even a slight increase or decrease in this small stock affects the market.

For comparison I have shown the percentage our unsold stock bore to the total production in each year since 1882, and the number of weeks the stock would last at the average consumption of the respective years. From this it is seen how dangerously light our stocks now are, and have been for the past two years. During the present year stocks in the West accumulated during the first three months, but have since then decreased both in coke and charcoal iron. This means that consumers have worked up their supplies and have again entered the market; we may, therefore, expect a more active demand from this time out. We believe we have reached bottom in prices; the cost of ore, coke, transportation and labor being now generally settled for the season.

With stock so light and prices so low as we now have them, and the general business of the country prosperous as it is, there is certainly no reason to feel discouraged at the outlook for pig-iron.

It is alarming to contemplate what would happen in the pig-iron market should our iron makers all bank their furnaces for one month, which could be done without the least danger to the furnaces. Of course such a course would be the extreme of folly, and is in the last degree improbable; but these figures show how dangerous such light stocks might become.

THE TEHUANTEPEC SHIP RAILWAY.

The announcement is made that the contract for building this line has been let to the Atlantic & Pacific Construction Company "on very favorable terms," which are not stated. In a recent interview Mr. WM. ROSEBURG said:

"Under the articles of agreement work on the construction of the road is to be begun within 18 months from this date, and must be finished within five years from the date of the commencement of the work. In other words, the company will have six and one-half years to complete the contract. Work on the roadbed, however, has already been commenced, and considerable of the grading has been done by Mexican laborers. The road is to be 135 miles in length and is to extend from a small town called Minnatitlin on the Atlantic coast to Lake Superior at the Pacific terminus. The cost will amount to in the neighborhood of $60,000,000, and the road, when built, as far as durability and finish are concerned, will be equal to any of our well-built American roads."

It is to be hoped that it will be built with the contingency in view of having to carry the ships afloat in a dock instead of simply supported dry on a truck as is shown on the published views of the great project. The most eminent shipbuilders have again and again stated their disbelief in the practicability of carrying a loaded ship uninjured over such a road, and we do not believe that Lloyds would be willing to insure them after having made the trip. It will, however, be possible to carry ships afloat in a water lock, or caisson, as is done on some of our canals, and as was proposed more than sixty years ago by those able engineers, HAZARD and WHITE, who proposed to carry canal boats from the headwaters of the Lehigh River down into the Susquehanna River in the Wyoming Valley.

The Chignecto Ship Railway, now offered to contract in Nova Scotia, will solve the problem long before the Tehuantepec road is finished, and if it should show, as seems probable, that it is not practicable to transport ships safely in the manner proposed, it will yet be time to adopt the water lock in which the vessel will float. This would necessarily vastly increase, probably treble, the load to be carried, but it undoubtedly would carry ships with safety.

ELECTRIC TRANSMISSION OF POWER.

Electric railways are becoming so common that the announcement of a new line or the adoption of electric locomotives scarcely attracts attention. The Union Electric Company's mine locomotives are doing excellent work in the Pennsylvania coal mines, and present some evident advantages over the steam locomotive underground. The electric transmission of power in the mining districts has already developed an enormous market for electrical machinery. From every part of this country and from nearly every foreign country inquiries are coming to our manufacturers of electric plant through their advertisements in the ENGINEERING AND MINING JOURNAL, showing the interest which is being taken in this great advance in engineering throughout the world. South Africa and Japan, Australia and Mexico, as well as all parts of this country, are wanting electric motors and electric transmission of power, and are all seeking for the machines here; for though this branch of engineering is still in its very infancy, American practice appears already to have taken a distinct lead.

We recently described an 18-mile installation for pumping, hoisting, etc., on the Big Bend of the Feather River, Cal., which is under contract by the Sprague Electric Motor Company.

In Arizona an installation is proposed to bring about 150 horse-power from a water-fall to a large mine and smelting-works, a distance of 8 miles, and it is estimated that the conductors will call for 8 tons of copper to the mile. This is an indication of one of the potent allies of the copper syndicate which may help to absorb their large surplus of copper. On the Comstock it is proposed to use electric transmission to run, in part at least, the new Nevada mill. At present this mill, which has 20 stamps, is run by a Pelton impact water-wheel, 11 feet diameter, using water under a head of about 650 feet, derived from the ditch of the Virginia & Gold Hill Water Company. It is now proposed to take the water after it has driven this wheel, lead it down the Chollar shaft to the level of the Sutro tunnel, where it will have about 1600 feet head, and there drive another 11-foot diameter Pelton wheel.

The underground installation will consist of five dynamos, and the power will be transmitted to the mill at the surface, about 2000 feet, through a ⅝-inch copper cable, and electric motors will then utilize it to drive the mill, which, as enlarged, will have 60 stamps, 30 pans, etc.

The consumption of water will be regulated to the power required to drive the mill, and it will undoubtedly be very much less with the 60 stamps than it now is with 40. As the water has to be bought, this will probably prove a substantial economy.

In the Consolidated Virginia & California mills the power has been transmitted through wire ropes from water-wheels situated at intervals of 500 feet vertically in the shaft, utilizing the pressure down to the level of the Sutro Tunnel; but faulty construction occasioned much trouble, which it is hoped can be altogether overcome by the use of electric transmission, which is to be used should the Nevada mill experiment result satisfactorily, as it no doubt will.

A Silver City, Idaho, mine is putting in a Sprague electric plant, to drive a 50-stamp mill four miles away from a water-fall, while the same manufacturers have recently received an order for an electric plant to be used in training and elevating the guns on the new U. S. Cruiser "Chicago."

We also hear of an iron company in the South thinking of running dynamos at the furnace to drive pumps several miles away.

From all parts of the country come inquiries concerning the economy of this method of transmission of power, and certainly in many cases the conditions are extremely favorable to the electric plant.

It would far exceed the limits of space at our command to enumerate all the projected electrical plants which have been reported. Nearly every town either has, or proposes having, electric tram cars. Many of our mines and metallurgical works are proposing to use electric locomotives, either with conductors or storage batteries. Nearly all mills and furnace works use electric lights. Mining machinery, drills, coal cutters, pumps and hoisting engines will be driven in many places by what is now the waste power of neighboring water-falls, and before long we shall have few waste water-falls. Nor is it true of this country alone. Foreign countries, especially those that are ill provided with cheap fuel, will, through the aid of American electrical machinery, share the benefits which we expect to reap in at home.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The San Miguel Gold Placer's Company.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Permit me to call your attention to what is called "A High-class Mining Investment" in the advertising columns of the JOURNAL.

It is the "San Miguel Gold Placer's Company," a prospectus of which has come into my possession, and while the property is, probably, all that is claimed for it, the price asked for the stock—par—seems to be unreasonably high. Briefly, the estimated quantity of gold in the placers is $5,770,516; the cost of extracting same is put at $1,642,629, leaving an estimated net profit of $4,127,887. It is also estimated that it will require from seven to fourteen years to work over the ground. The capital is $3,000,000, and "a portion of the stock of this company is now offered to the public at its par value of $10 per share."

Assuming that the expectations of the promoters are fully realized, the profit per share would be but $3.70; or, in other words, for every dollar invested in the stock, one has a reasonable *possibility* of getting back $1.37 within seven years, which would be at the rate of about 20 per cent per annum. But since, at the end of this period, all that would remain to represent the capital would, probably, be a used-up plant, and a vast quantity of barren gravel and boulders, 14⅔ per cent must be deducted from the 20 per cent to provide a sinking fund for the replacement of the capital, leaving a beggarly five per cent per annum as interest on the investment. One would scarcely judge from the names of the officers of the company that it is a scheme to fledge the unwary. And yet a mining proposition that offers an uncertain security at best, and, even if the promoter's hopes are fully realized, but five per cent per annum on the price at which the shares are offered, can hardly be considered "a high-class mining investment." Respectfully, MINING ENGINEER.

NEW YORK, June 13, 1888.

[We quite agree with our correspondent that the price at which the stock is held is far too high to be a safe, much less "a high-class," mining investment.—ED. E. AND M. J.]

Alaskan Mines.—Bursting of the Nowell Bubble.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The bubble is "busted," as you will see by the following extract from the Juneau City *Mining Record* of May 31st:

"The Alaska Union Mill and Mining Company shut down their 80 stamp mill last week, after crushing about 500 tons of rock, the result of which proved

unsatisfactory. Mr. Thomas S. Nowell, president of the company, and the heaviest stockholder, who had the utmost confidence in the enterprise, not being a practical and experienced miner, and having been surrounded by advisers who displayed very poor judgment, expended considerable money in developing this property to a finish. He has finally become thoroughly satisfied as to its merits, and ordered the works closed down. The *Mining Record* regrets the failure of Mr. Nowell, who has labored faithfully and conscientiously to develop his property to a successful termination, and extends its sympathy to him and his associates. However, the failure of this particular property is no criterion by which to judge other properties owned by Mr. Nowell, and upon which he proposes to commence the work of thorough investigation, and we have every assurance that the results will prove successful.

"Mr. Nowell has unlimited faith in Alaska as an excellent mining region, notwithstanding the loss he has sustained by the failure of the Alaska Union. He intends devoting his attention during the entire summer to mining operations. He is now in a position where he can give a thorough milling test of any or all properties he proposes to develop, having an excellent stamp mill in good working order, and can remove fifty or one hundred tons of rock from other places to it, and have it tested to a satisfaction beyond question. We understand that he has a very fair prospect from the Consolidated on Douglas Island, near his mill, and that he intends giving it a thorough test by milling. The mere fact that Mr. Nowell intends remaining in our midst is evidence sufficient that he is sincere and conscientious in his undertakings, and that his faith in the mineral wealth of Alaska is in no wise shaken. The *Mining Record* joins with all residents of Alaska in wishing him unbounded success."

Alaska is free from bubbles. THE ENGINEERING AND MINING JOURNAL has done its duty to its patrons and the public in general. Now, let those who invested their cash in the bubbles without investigating, look after their own interest.

The other bubbles in process of incubation died with the Alaska Union, without doing any material damage, as far as can be seen here.

Investors in legitimate mining enterprises can again put faith in statements received from here. I do not wish to be understood that they ought to buy without investigation; but the bubble blowers, if not dead, are not in the field at present.

The statements you made, and which at the time seemed to some to be exaggerated, are now shown to have contained nothing but the truth.

There are nevertheless several properties here which will fully justify the big statements erroneously made concerning the Alaska Union. Alaska is a good field for the largest mining operators, as well as for the small capitalist and prospector. Its mining industry is young in years, but its output is far ahead of that of any mining country of the same age, and what is better still, the resources already discovered are such that this generation will not see them exhausted.

The simple fact that a gigantic bubble like the one above referred to can be blown so successfully is good evidence that we are in an extraordinarily good district. The blowers, however expert they may be at the business, would not have been able to do it in a poor or worthless one.

ALASKA.

COAL PRODUCTION OF THE UNITED STATES IN 1887.

We are indebted to Mr. Charles A. Ashburner, assistant in charge of coal statistics of the United States Geological Survey, for the following statistics of coal production in 1887:

The following statistics have been compiled principally from the direct returns of the operators of individual coal mines, and of railroad agents, supplemented by valuable facts contributed by State officials:

The total production of all kinds of commercial coal in 1887 was 123,965,255 short tons (increase over 1886, 16,283,046 tons), valued at the mines at $173,530,996 (increase, $26,418,241). This may be divided into Pennsylvania anthracite, 39,506,255 short tons (increase, 2,809,780 short tons), or 35,273,442 long tons (increase, 2,508,732 long tons), valued at $79,365,244 (increase, $7 807,118); all other coals, including bituminous, brown coal, lignite, small lots of anthracite produced in Colorado and Arkansas, and 6000 tons of graphitic coal mined in Rhode Island, amounting in the aggregate to 84,459,000 short tons (increase, 13,473,266 tons), valued at $94,165,752 (increase, $18,611,123).

The colliery consumption at the individual mines varies from nothing to 8 per cent of the total output of the mines, being greatest at special Pennsylvania anthracite mines and lowest at those bituminous mines where the coal-bed lies nearly horizontal and where no steam power or ventilating furnaces are used. The averages for the different states vary from $2\frac{1}{16}$ to $6\frac{1}{7}$ per cent, the minimum average being in the Pennsylvania bituminous and the maximum average being in the Pennsylvania anthracite region.

The total output of the mines, including colliery consumption, was: Pennsylvania anthracite, 37,578,747 long tons (increase over 1886, 2,725,670 long tons), or 42,088,197 short tons (increase, 3,052,751 short tons); all other coals, 87,837,360 short tons (increase, 14,129,403 tons), making the total output of all coals from mines in the United States, exclusive of slack coal thrown on the dumps, 129,925,557 short tons (increase, 17,182,154 tons), valued as follows: Anthracite, $84,552,181 (increase, $8,433,061); bituminous, $97,939,656 (increase, $19,458,600); total value, $182,491,837 (increase, $27,891,661). The above figures show a notable increase in 1887 over 1886 in the aggregate output and value of both anthracite and bituminous coal.

The total production and the spot value in each State and Territory, exclusive of colliery consumption, are shown in the following table:

PRODUCTION OF COAL IN THE UNITED STATES IN 1887.
(Exclusive of colliery consumption.)

States and Territories.	Quantity Short tons.	Value at mines.	Per ton.	States and Territories.	Quantity Short tons.	Value at mines.	Per ton.
Pennsylvania:							
Anthracite.	39,506,255	$79 365,244	$2.01	Indian T'y....	685,911	1,286,692	1.88
Bituminous.	30,866,632	27,806,941	0.90	N. Mexico T'y.	508,014	1,524,102	3.00
Ohio.....	10.3 1,708	9,096,848	0 88	Georgia.....	313,715	470,573	1.50
Illinois	10,278,890	11,152,596	1.08	Utah T'y....	180,021	360,042	2.00
West Virginia.	4,836,820	4,594 979	0.95	Arkansas....	150,000	252,560	1.68
Iowa	4,473.828	5,991,735	1.33	Texas.....	75,000	150,000	2.00
Maryland.....	3,278,023	3,114,122	0.95	Michigan.....	71,461	107,191	1.50
Indiana.....	3,217,711	4,324 604	1.34	California ..	50,000	150,000	3.00
Missouri.... ..	3,209 916	4,298 994	1.34	Oregon..... ..	31,696	70,000	2.20
Kentucky	1,933,185	2,223,163	1.16	Dakota T'y....	21,470	32,205	1.50
Alabama ...	1,900,000	2,470,000	1.33	Montana T'y.	10,202	35,707	3.50
Tennessee....	1.900.000	2,470.000	1.33	Rhode Island.	6,000	16,250	2.70
Colorado.	1,791,735	3,941,817	2.20	Nebraska.	1,500	3,000	2.00
Kansas	1,596,879	2,23.,631	1.40	Idaho	500	2,000	4.00
Wyoming T'y.	1,170,318	3,510 954	3.00				
Virginia..... ..	825.263	773,360	0.94	Total.....	123,965,255	$173,530,996	$1.40
Wash. T'y ...	772,612	1,699,746	2.20				

THE USE OF MAGNESITE AS A REFRACTORY MATERIAL.*

By K. Sorge.

Although the value of magnesia as a material for the linings of open-hearth steel furnaces was, according to the author, demonstrated by a comprehensive series of trials made by Wasum in 1884, it has not up to the present time been very largely adopted, in spite of its evident advantages. This is to be ascribed to the use of an inappropriate raw material. In the earlier trials the bricks were made of precipitated magnesia, which is nearly chemically pure, and practically without cohesive power, so that an addition of foreign binding matter (clay, alkalies, etc.) became necessary in order to obtain bricks of sufficient strength, and by this means the refractory character was appreciably injured. The results obtained with magnesite from Upper Silesia and Eubœa, in Greece, were very similar, as these minerals, when calcined and exposed to the highest attainable temperature, showed no signs of fritting, so that an addition of at least as much as 15 per cent of clay was required to make serviceable bricks. The only useful variety of the mineral that has been found is that from the Veitschthal in Styria, which is of a sparry crystalline character, and varies in composition between the following limits:

Carbonate of magnesia	90·0 to 96·0	per cent.
" lime	0·5 " 2·0	"
" iron	3·0 " 6·0	"
Silica	Max. 1·0	"
Sesquioxide of manganese	" 0·5	"

The small proportion of iron present imparts the property of softening without fushion at a high temperature. The specific gravity, which in the natural mineral is about 3·0, is increased to 3·4 when burned to the caustic condition, and to 3·6 when "dead burnt." In the latter state it is perfectly stable in the air, and may be exposed for years without taking up either water or carbonic acid, and when made into bricks only contracts about 4 per cent upon the molded volume. For the latter purpose, however, a small proportion of binding material is necessary, and the molding must be affected by hydraulic pressure. The most convenient size of brick is 240 × 120 × 65 millimeters. In setting the bricks either tar or magnesia mortar may be used; the latter is made of caustic, mixed with a variable proportion of strongly burnt magnesia. This is used with as little water, and the narrowest possible joints in the brickwork. Owing to the very high temperature required to produce cohesion, it is not advantageous to attempt to make the whole thickness of the hearth out of the plastic mass, but is preferable to build it up of bricks either flat or edgewise, and to make the working surface by a covering of molded mass from 15 to 30 millimeters thick. This is applied to the brickwork after the latter has been exposed to a bright red heat for forty-eight hours, when the finely-ground material is introduced, a shovelful at a time, and beaten down by rammers weighing from 30 to 60 kilograms. Much depends upon the manner in which this part of the work is done. When the bed is finished a layer of 2 to 3 centimeters of lime is laid upon it, and upon this the charge of iron and other materials is made.

When properly made a magnesia lining will last during the working of from five hundred to six hundred charges, and, except where accidents happened at first, the endurance has rarely fallen below three hundred charges. Many smelters consider it advantageous to take out and replace the uppermost layer of the brickwork after melting three hundred charges, in order to avoid larger and more expensive repairs at a time. The average amount of material required for making good the injury to the hearth during the working may be taken at about 20 to 25 kilograms per ton of steel produced. The price of magnesite bricks in Westphalia is about £7 per ton, and that of the plastic mass £5 15s. At these prices the amount required for a 10-ton furnace will cost:

	£	s.
Bricks, 12 tons	84	0
Plastic mass, 3 tons	17	5
	£101	5

Assuming that the hearth is entirely renewed after three hundred charges, or a total production of 5000 tons of ingots, the expenditure will be:

	£	s.
Lining as above	101	5
Material for repairs, 5000 × 20 kilograms = 100 tons	575	0
	£676	5

The cost of magnesite reduced to the ton of steel produced is therefore about 2s. 9d.

The advantages due to the use of this material are said to be:

1. The charge may be dephosphorized to the extent of 98 per cent of its total phosphorus without difficulty.

2. Magnesite bottoms allow of the addition to the charge of 30 per cent and upwards of iron ore, and, therefore, facilitate the use of every kind of raw material.

3. Magnesite bricks may be made of very regular shape, so that the building of the hearth in an accurate and durable form is much facilitated.

4. Magnesite may be built up in direct contrast with silica brickwork, which is not possible with any other kind of basic material.

5. The durability of a magnesia lining far exceeds that of any other basic substance, and is, therefore, less costly, as not requiring extensive repairs at short intervals.

6. Magnesite, when exposed to the action of basic slags and metallic oxides, resists corrosion better than any other known substance.

7. The absolute indifference of bricks and burnt magnesite to the action of the air makes it possible to preserve them in quantity for any time without fear of alteration.

8. The danger of using a partially altered material, and therefore one of small durability, as may happen with dolomite, is completely avoided with magnesite.

These advantages are sufficient to counterbalance the somewhat high price of magnesite products, and the author considers that it would be

* Abstract of a paper by K. Sorge in *Stahl und Eisen*, Vol. VII., 1887, p. 850. From the proceedings of the Institution of Civil Engineers of London; edited by James Forest, Secretary.

to the interest of every open-hearth steel works to make at least one experiment with them on the large scale. With 12 and 15-ton furnaces the cost per ton would be proportionately smaller than the figures given above.

HYDRAULIC GOLD MINING IN NEVADA.

The peculiar conditions which permitted and preserved the enormous gold-deposits of the "dead rivers" of California did not, apparently, occur elsewhere in this country. The great extension and continuity, north and south, of the gold-bearing slates, and the deep erosion of the Sierra cañons crossing them, coupled with the vast overflows of lava which covered and protected the auriferous gravels, can scarcely be paralleled in any other mountain range.

It is unfortunate that the business of hydraulic mining in California, which promised to be for many years a solidly prosperous one, and in which the enterprising men who had spent millions of dollars on the preparatory work of ditches, flumes, tunnels, etc., were just beginning to realize the profit of their courageous investments, was paralyzed by legal contests in the very height of its activity. The cause of this disaster was indirectly geological, too. For the same great causes which wrought the rich accumulations of gold, wrought also the fertile lands of the San Joaquin and Sacramento valleys, and thus made a place upon which the victorious Granger might take his stand, to smite the miner hip and thigh.

We have said that these natural conditions were not repeated in other ranges. But it does not follow that there were no rich gold-deposits made in the river channels of the Rocky Mountains, the Wahsatch, or the parallel ranges of the interior basin. The contrary might be proved by numerous instances, from the wonderfully productive gulches of Idaho and Montana down to the once famous placers of Colorado, New Mexico and Arizona. In Nevada, the Comstock lode itself was discovered as a consequence of gold digging at the foot of Mount Davidson. While we would not dogmatize on the insufficient data within our knowledge, we may be permitted to say that these cis-Californian placer and gravel mines have proved, on the whole, and so far as we can now recall, limited in extent, but often astonishingly rich within their narrow boundaries. We may instance the gulches at Virginia City and Helena, Montana, and California Gulch at Leadville, as historic examples. And some localities in the Rocky Mountain region which we have personally examined, seem to have been peculiarly the sites of concentrated, rather than distributed, deposition.

For while it is true that all placer and gravel deposits are accumulations in which gold has been to some degree concentrated, yet this degree of concentration itself, and the proportion of the auriferous channel to the general mass of the *débris* ground are features which may vary greatly; and not uncommonly the smaller areas of auriferous ground, supplied from immediately adjacent mountain slopes, have proved much richer than the larger ones, in the formation of which glaciers, floods and eruptions have interfered to interrupt, disturb, remove, bury or scatter the original deposits, and render their exploration and exploitation a work of difficulty and expense.

In spite of all these obstacles, the business of hydraulic mining in California had been reduced, when rudely interrupted by the "*débris* litigation," so nearly to a science that men were willing to invest immense sums in the preparatory work, often occupying years of expenditure without returns, in the well-founded confidence that when the harvest time should at last arrive, it would quickly repay all outlays, and bring a long period of steady and large profits. The books of Mr. Bowie and Mr. Hamilton Smith show what accomplished engineers were bred in this industry; and apart from the abundant proofs furnished by the bullion-shipments from the hydraulic mines, it might be urged as a conclusive argument that such engineering work is not brought forth by purely enthusiastic and speculative enterprises.

The results of all this experience and skill are now benefiting the rest of the Western country. The partial cessation of hydraulic mining in California inclines those who know both its difficulties and its rewards, and who deem it, when properly conducted, the safest of all forms of mining investment, to look for other fields in which to practice it; and we hear from various quarters of auriferous gravels, sometimes newly discovered, sometimes long known, but never yet attacked with adequate capital, skill and machinery, which are now likely to be made productive and profitable.

THE OSCEOLA GOLD MINE.

One of the most interesting discoveries of this kind is at Osceola, on the western side of Mount Wheeler, the highest peak of the Snake range, in White Pine County, Nevada. We take a few characteristic points concerning it from the manuscript report of a prolonged and detailed examination by Prof. G. W. Maynard, accompanied with maps, sketches and statistics of actual working.

The gravel deposit occupies a deep cañon, at the mouth of which it spreads out fan-like, towards the open foot-hills and the valley. Bed-rock can be clearly traced around its borders; and the gravel is so exposed that it can be easily tested, not only by sampling the banks of the actual workings, but also by shafts, cheaply sunk. Some $40,000 have been already taken from the ground, which has yielded (apart from $5000 in nuggets) 19·6 cents per cubic yard. This does not include workings on the bed-rock, where very rich material, showing $11 to $50 per cubic yard, was explored by shafts and drifts under Professor Maynard's direction. The deepest shaft strikes the bed-rock at about 250 feet. The sluicing of *all* the material (205 cubic yards) from the lower hundred feet of this shaft, and from a 50-foot drift on the bed-rock, yielded something more than 21 cents per cubic yard. The average depth of gravel over bed-rock is about 150 feet, and its area within the outcropping bed-rock rim is 7875 by 2640 feet, giving an aggregate of about 100 million cubic yards of the gravel.

The source of the gold was evidently the neighboring mountains; and the confined and narrow cañon seems to have greatly favored a concentration in easily-followed channels. The present proprietors have never had any difficulty on that head. Their greatest obstacle has been the lack of water. Their present ditch has never carried more than 1250 inches as a maximum; and the actual delivery last year averaged daily in miners' inches as follows: April, 180; May, 400; June, 650; July, 375; August, 175; and for the autumn about 100.

The securing of an adequate and more uniform water-supply is therefore the critical question. The reputation of Nevada for running water is not of the best; but the slopes of the Snake range, on the eastern edge of the State are not as barren as those of the interior ranges. Mt. Wheeler, over 13,000 feet high, carries snow the year round; and its sides are reported to present the phenomenon, somewhat unusual in Nevada, of hemlock forests. By buying certain water-rights, building a new ditch about 24 miles long (at a cost of $120,000), and providing storage reservoirs, a regular supply of about 2600 24-hour inches for seven months of the year can be secured. This estimate of quantity is based on monthly measurements for three years of the streams to be utilized, with liberal deductions for leakage and evaporation.

There are no farms to be injured by *débris*—a fact of high importance for the future.

While our interest in the case is merely professional and scientific, we feel bound to say that the report of Prof. Maynard has impressed us as exceedingly careful and conservative. His frank declaration that he is interested in the purchase of the property does not in our judgment weaken the force of his very temperate arguments and his convincing array of proofs from practice. We can not help feeling that he has made out a strong case. The financial arrangements which his clients propose are extremely liberal to capitalists, involving as they do no pecuniary bonus to any body concerned, but, on the contrary giving, in return for the money required for its development, the control of the property and a prior claim on the profits until the investment shall have been fully repaid, and a large permanent interest afterwards. This is a refreshing departure from the usual custom of "promoters;" according to which the capitalist, without whose assistance mines can seldom be adequately developed, is asked to pay handsomely for the privilege of assisting, while the owners and middle-men realize at once enough to pay them for their trouble and risk anyhow. The proprietors of the Osceola deposit have set a good example. We hope that they will succeed in obtaining the help they need, and that a model enterprise may be developed to its full capacity in this secluded spot. We need not add, that the seclusion will vanish as soon as the dividends begin.

Iodide of Mercury in Tanning—A New Use for Quicksilver.—The addition of a small quantity of iodide of mercury to skins is found to effectually prevent fermentation setting in, and at the same time to produce no injurious effects in the subsequent tanning operations. It is said that the mercury salt acts as a preservative of the constituents of the tannin liquors, and that leather produced from skins that have been previously treated in this manner is superior to that tanned in the ordinary way. Messrs. Collin & Benoist, the French chemists, who have experimented with this anti-ferment, state that it completely prevents the liquefaction of the gelatine which takes place in putrefying hides, and thus saves them from this loss. A saving is also effected by its use in the prevention of the decomposition of the tannin in the tanning liquid, which is usually hastened by the introduction of the hides when in a state of decomposition. The amount of iodide of mercury required is so small that there is no possible danger from poisoning, either to the workmen or to those subsequently using the leather, in its use.

THE SULPHUR MINES OF THE CAUCASUS.

Translated for the Engineering and Mining Journal.

The Revue Commerciale et Industrielle du Caucase gives the following interesting account of the sulphur deposits of Tchirkate belonging to Prince Eristoff, and situated in Southern Daghestan not very far from the junction of the river Roïsou d'Andi with the Avare. On the left and nearly vertical slope of the valley of Birgoutchi-Kal at an altitude of 1750 meters, and on an extent of 100 meters several old Tartar workings are found, but they are all caved in. On the lateral margins the stringers of sulphur appear having a thickness from a few millimeters to 20 centimeters. These stringers are intercalated with the clay impregnated with crystals of quartz and gypsum.

After the discovery of these deposits, in 1802, they were worked for thirty-five years by the mountain tribes of Tchirkate, who produced about 16 tons of sulphur per year, the crude mineral containing about 60 per cent of sulphur. Later on, the deposit was worked for ten years, some of the ore being sold, and the balance went to Schamyl as a tribute or royalty. The percentage of sulphur in the ore was, however, not more than 36 per cent. After Albich's explorations in 1859, and from 1864 to 1866, Mr. Koltchewsky, by order of the Russian Government, conducted explorations upon an area of 12 square kilometers, between the rivers Birgoutchi-Kal and Gouni-Kal, giving the following results: The right bank of the Gouni-Kal, and particularly the left bank of the Birgoutchi-Kal, very steep and picturesque, are formed by sandstones, dolomites, marls, gypsum, and clay shists (argillaceous slates). The orographic character of the country is the result of subterraneous action working in two different directions; the first motion of the terrestrial crust directed toward the northwest, forming the valleys of Birgoutchi and Gouni-Kal, the second directed to the northeast, forming the Soulak Valley.

The country consists of sedimentary beds, which Mr. Abich classes as belonging to the jurassic and cretaceous. They succeed each other downwards in the following order:

1. The alluviums of the left bank of the Birgoutchi-Kal, composed of blocks of sandstones, limestones, and argillaceous slates.
2. Dolomitic breccia, composed of large blocks of dolomitic limestones with a cement of the same nature. These rocks still belong to the alluviums.

The following rocks belong to the lower series of the cretaceous:

3. Yellow friable sandstones composed of fine grains of quartz cemented by lime or clay, the thickness of this bed being 18 meters.
4. Granular spongy dolomitic limestone of a greenish-gray color, very hard, tenacious, and but little fossiliferous; in a few places, beds of calcareous sandstones and sandy marls, changing to dolomite, are met with. The whole of the dolomite beds are full of fissures, some of which are filled with crystals of pearlspar. The existence of these fissures and the spongy state of the dolomitic limestones is in conformity with the theory generally admitted as to their origin.

The following rocks belong to the upper and lower series of the jurassic:

5. The granular gypsum, of a snow white color, compact and tough, is fissured in a few places only. The bed of gypsum contains intercalations such as dolomite or as dolomitic limestone. The total thickness of this bed is 140 metres. Above the gypsum and below the cretaceous dolomitic limestone is a tolerably regular bed of bluish argillaceous schist impregnated with crystals of gypsum and alum, and containing sulphur in the form of small seams 30 centimeters in thickness. The thickness of this argillaceous bed varies from 0·7 to 1·5 meters. The parts richest in sulphur are near the hanging-wall, the parts near the foot-wall containing more gypsum, thus forming the transition with the lower gypsum.
6. Yellow-gray dolomitic limestone, with fissures filled with calcspar. The thickness of this bed is about 100 meters.
7. Gray argillaceous sandstone, containing a few intercalated beds of sandy marl and nodules of spherosiderite. The thickness is 48 meters.
8. Argillaceous schists, with layers of marl intercalated. Thickness, 100 meters.

The general direction of the beds is N. 30° W.; the local directions range between N. 15° to 60°. The dip is from 10° to 20° N. E.

Mr. Koltchewsky had 14 openings made showing the deposit, each giving a certain quantity of mineral, and thus the average richness was arrived at. These openings produced about 320 cubic meters of rock and demonstrated that the extent of the deposit was 600 meters on the dip. Taking the average thickness of the layer at 2 meters, the deposit contains a known mass of 12,000 cubic meters of mineral, carrying from 10 per cent to 20 per cent in sulphur. M. Koltchewsky had been under the impression that this bed contained a much larger quantity of mineral, and that nearly 100,000 tons of sulphur would be available.

In 1880, the Compagnie Française Lescaud sent M. Gounod, a French engineer, and W. Haltatchi, an Italian engineer, to examine Prince Eristoff's mine. They reported that the quantity of sulphur which could be extracted at 49,000,000 pouds upon a length of 2½ versts and a width of from 200 to 300 sagènes. But as Baku gets some of its supply from Recht, in Persia, the sales of the Tchirkato sulphur are very difficult.

Cliff Dwellings in Morocco.—Recent discoveries have shown that cliff dwellings are found in great numbers in Morocco, which are now, and probably have been, inhabited from the time of their first construction. These dwellings in all particulars are like those found in Arizona and New Mexico on this continent. A New York paper speaks of them as follows: It was not until last year that the Moors would permit any examination of the cliff dwellings which have long been known to exist some days' journey southwest of the city of Morocco. The strange city of the cave-dwellers is almost exactly like some of those in New Mexico and other territories, which archæologists have explored. The dwellings were dug out of the solid rock, and many of them are over 200 feet above the bottom of the valley. The face of the cliff is, in places, perpendicular, and it is believed that the troglodytes could have reached their dwellings only with the aid of rope-ladders. Some of the dwellings contain three rooms, the largest of which are about 17 × 9 feet, and the walls of the larger rooms are generally pierced by windows. Nothing is known as to who these cave-dwellers are.

RELATION OF TIN TO TRAP DIKES.

Written for the Engineering and Mining Journal by Courtnay de Kalb.

In Western North Carolina cassiterite is frequently found in small quantities; but the prospecters of that region are almost wholly unacquainted with the appearance of tin ore, and would pass it by unnoticed; consequently the opportunities for its discovery have been exceedingly small. The paragenesis of cassiterite in the Apalachians is such as to induce strong suspicions, from the indicative minerals already known to exist, that it may be found in workable deposits somewhere in the chain. I have heard of no case of its occurrence in greisen, or in the granite series of the region, but always in quartz veins, in close proximity to basaltic dikes. The quartz, which is invariably full of cavities, is strongly impregnated with mispickel, and has associated with it topaz, apatite, and sometimes considerable amounts of fluor spar. The occurrence of minerals containing fluorine in the neighborhood of trap dikes is an indication of the probable existence of tin in the same locality, a sufficient sign at least to warrant the prospecter in making a careful examination of the "float." Guided in this way, cassiterite was found in one place in Haywood County, and at another in Henderson County, N. C., although the amounts were not large enough in either instance to lead to further exploration.

This association of tin-bearing rocks with basalt finds an explanation in the discovery of Daubreé, that fluoride of tin is volatile at a high heat, but is readily decomposed in contact with other substances, resulting in the formation of new fluorides, while stannic oxide is set free. An eruption of basaltic lava would provide all the conditions for the volatilization and escape of fluoride of tin, and for the deposition of cassiterite in fissures nearer the surface. Of course this applies only to tin ore in true veins, but in the Appalachians, where this is the prevailing condition, a knowledge of this relationship may be helpful in leading to important discoveries.

OCCURRENCE OF GOLD AND SILVER IN OXIDIZED COPPER ORES IN ARIZONA.

Written for the Engineering and Mining Journal by Alex. Trippel, M.E.

Gold is not unfrequently found in chalcopyrites or other sulphide combinations of copper, or in arsenical pyrites, in Yavapai County, but it has rarely been recognized in oxidized copper ores, such as found in several localities in Arizona. These ores, as is well known, are an intimate mechanical mixture of the oxides of iron, copper and occasionally manganese, more or less siliceous or calcareous.

Silver occurs far oftener, but is always associated with copper glance or the products of its partial decomposition. I observed but two cases where silver occurs with the oxidized mass, which constitutes our ore. In the fifth level of the Globe mine, native silver is found in filaments and scales, going through cuprite and associated with calcite. Its appearance is limited to isolated small spots in the midst of non-argentiferous ore. In the other case, pure argentite in minute grains is imbedded almost regularly through such an oxidized mass which has a most peculiar appearance.

The co-relation which seems to exist between the copper and silver ore deposits in Globe District is remarkable, but a knowledge of its precise nature must be left to future developments.

Gold occurs in such ore in the Keystone mine here, of which mention was made by Mr. A. Wendt. There, imbedded in the ore, the gold is found in flakes, scales, and occasionally in solid small bodies, the ore assaying generally above 20 per cent copper. However, the metal produced from that ore was unsuitable for market, and the work in the mine was stopped. In order to determine the cause of this defect, several partial analyes were made by Mr. A. L. Walker, my assistant, with the following result:

	SO_2.	CuO.	As_2O_5.	P_2O_5
No. 1	15·65	28·89	1·3	0·77
No. 2	25·44	36·95	0.40	0·22
No. 3	30·97	22·70	0·53	0·30
No. 4	38·82	30·48	0·26	0·16
No. 5	22·86	48·46	0.29	0·17
No. 6	28·82	17·90	2·94	1·65

It will be seen that the proportion between the arsenic and phosphoric acid remains the same in all these analyses. No search was made for other substances, but the metal produced from such ore was pale-yellowish in appearance, very brittle and, when analyzed, showed arsenic, 4·09 per cent.; antimony, 0·38 per cent.

This confirms the well-known great difficulty in expelling arsenic from copper, especially in a blast-furnace. The small quantity of gold in the copper was insufficient to make its value available.

Lately I have seen similar oxidized ore from Seneca District, Yuma Co., but in this case the gold is present in a larger quantity and specimens were litterally speckled with larger and smaller grains and filaments of gold. A moderate looking piece assayed 11½ of gold, 5 ounces silver and 22 per cent copper. At present, the second class ore is milled, the tailings concentrated and sold as copper ore; the gold yield in the battery from such ore was 86 ounces gold from 94 tons ore, leaving ½ ounce gold per ton in the concentrates. I propose to analyze the ore shortly, to see if the gold had its origin from decomposed arsenical pyrites, as it seems to have done in the first case.

Globe, A. T.

Where Phosphorus and Manganese are in Basic Pig-Iron.—According to Herr C. Reinhardt, the proportion of phosphorus and manganese in basic pig-iron is almost invariably greater at the edges of a section than it is in the center. In the case of slowly cooled gray cast iron the quantities of phosphorus and manganese vary throughout the mass, but appear to do so together. In a mass of the metal, phosphorus is very unevenly distributed in the various layers, and its amount appears to be greatest at the surface. The same may be said of manganese, and with a rapidly cooled sample both metals are found in the largest proportion, not only in the surface layer, but upon the whole exterior surface of the pig-iron.

MICA MINING IN NORTH CAROLINA.—VII.

By Wm. B. Phillips.

(*Concluded from Page* 418.)

In bringing these articles to a close it seems necessary to explain why no statistics have been given. Such as are accessible will be found in a compilation by the writer to be published shortly in the "Mineral Resources of the United States for 1887," U. S. Geol. Survey. In this volume will be found also a more concise and less technical account of the industry, and those who wish a bird's-eye view of the matter are referred to it.

North Carolina, for several years past, has contributed over 60 per cent of the mica produced in the United States. With New Hampshire, she produces fully 95per cent of the better quality of mica in the country, and while, indeed, it can not be asserted that her mica is better than that from other sources, it is just as good, and the statistics above referred to show that it is mined at less cost than New Hampshire mica.

I must say, however, that in my opinion these statistics are erroneous. There can not exist such a difference between the effective value of a dollar in North Carolina and New Hampshire as they reveal. It is impossible to believe that one dollar in North Carolina yielded $8.93, and in New Hampshire only 20 cents, especially when we consider that, in the former state, Shaft mining is the rule and open cut the exception, and in the latter, open cut is the rule and shaft mining the exception.

The much vexed question of cost accounts should not be submitted to census-takers. It needs something more than mere scientific information to settle the actual cost of even so simple a product as mica, and while the local conditions in North Carolina favor cheap mining they do not necessarily imply it. After devoting several years to the study of North Carolina mica mines, and, what is a still more difficult subject, mica *miners*, I do not as yet find myself in a position to give an opinion on the cost of a pound of mica ready for shipment. That it is less now than it was ten years ago there is good reason for believing, as also for believing that it will be still farther diminished by the introduction of improved machinery, drills, hoists, etc.

The miners and dealers in North Carolina are not at present at all happy over their prospects. The change to a smaller pattern, the importation of foreign mica (which pays no duty), and the discovery of other mines, as in Dakota, Black Hills, Colorado, etc., are among the chief causes of alarm.

The output is diminishing, and that in spite of many good mines still unworked. The industry, while indeed never of any very great dimensions, was of considerable consequence to the immediate vicinity.

Probably $300,000 was the greatest value ever reached by any annual yield, and for the 20 years in which the business has been carried on it is not likely that the value of the product exceeds $1,700,000.

Mitchell and Yancy counties have contributed most of the mica from North Carolina. Good mines have also been opened and worked in the counties of Stokes, Cleveland and Rutherford, east of the Blue Ridge, and Buncombe, Haywood, Jackson, Macon and Cherokee west of the Ridge.

According to W. C. Kerr,* a timbered shaft, 100 feet deep, has been discovered on Valley River, Cherokee County.

F. W. Simonds states† that in the Guyer mine, Macon County, at depths varying from 35 to 50 feet in a shaft of prehistoric age, were found in 1875 some iron implements, as a pair of gudgeons, a wedge, etc., of wrought iron. Shaft mining has been carried on in this State for 200 years or more. An exploring party sent out by De Soto may have penetrated as far north as the southwestern corner of North Carolina.‡

Prehistoric remains of open cuts and shafts for mica mining are found in Alabama, along a line stretching from Chilton County northeast through the counties of Coosa, Clay and Cleburne.§

It is a little surprising that an industry so old, and yet so new, should have received such scant attention. There is, perhaps, in the whole country no better place for the study of fissures, and of the forces causing them, than a well opened mica mine.

It is the purpose of the writer during the ensuing summer to figure and describe more particularly some of the more interesting of these mines in Yancy and Mitchell counties, and to seek anew for the relations subsisting between the quality and quantity of the mica, and the depth, dip, strike and walling of the vein, and the influence exerted by accompanying minerals.

If what has been said shall lead those concerned in such matters to inquire more especially into them, these articles have not been written in vain. The mica mining counties will well repay close study, not only on account of the mica, but even more on account of other minerals, as iron ores, chrome ores, corundum, asbestos, graphite, talc, etc. Some of the most magnificent forests of virgin timber in this or any other country still adorn the mountains and hills of these counties. Chestnut, locust, walnut, poplar, pine, cherry, etc., flourish in great abundance and beauty. The new railroad projected down the Toe River into Tennessee will open a country that needs only to be known to be appreciated. A fertile soil, an unsurpassed climate, varied and abundant natural products, all combine to render this part of North Carolina the potential garden spot of the State.

The World's Production of Pig-Iron in 1886 and 1887.—The British Iron and Steel Institute publish the following statistics:

	1887. Tons.	1886. Tons.	Increase or decrease in 1887.
United Kingdom	7,441,927	6,870,665	I. 571,262
United States	6,417,148	5,683,324	I. 733,824
Germany	3,907,364	3,528,658	I. 378,706
France	1,610,851	1,507,850	I. 103,001
Belgium	754,481	701,277	I. 53,204
*Sweden	442,457	464,737	D. 22,280
*Austria-Hungary	670,000	620,000	I. 50,000
*Russia	490,470	470,000	I. 20,470
*Spain	180,000	159,225	I. 20,775
Totals	21,914,698	20,005,736	I. 1,908,962

* These are returns for 1886 and 1885.

*Rept. of Prog. N. C. Geol. Survey, 1869, p. 56.
†Amer. Naturalist, Jan., 1881. Reprint.
‡Bancroft, Hist. of the U. S., 13th Ed., Vol. 1, pp 47-48.
§Eugene A. Smith, State Geol. Ala. Priv. Com., Oct. 4, 1887.

Cost of Colliery Surveys in Westphalia.—Mr. H. Werneke, in *Mittheilungen aus dem Markscheiderwesen*, says from information supplied by the Royal Mining Department of Westphalia that at the one hundred and ninety-four collieries in that district, during the years 1880, 1881 and 1882, the average annual expenditure on the preparation of mine plans and on other mine-surveying operations amounted to £9323 16s. This sum represents an average of 8¾d. (17 cents) for every 100 tons of coal raised, or 2s. 1d. (say 50 cents) for each workman employed.

Mines in Ecuador.—The British Consul at Guayaquil reports that the works on the Zarama gold mines continue. New machinery has been put up by the Quebrada Mining Company, which is to commence milling shortly. The Compañia Esplorada de Minas has sent its representative to Europe to make arrangements to raise capital for working about eighteen mines. A new English company has undertaken the exploration of another group of mines in Zarama, and has sent out an engineer and materials for the purpose. The Consul states that so far no decisive results have been obtained sufficient to warrant an opinion being given as to the ultimate success of these new enterprises.

Lick Observatory Completed.—After thirteen years the Lick Observatory at Mount Hamilton is completed, and on the 1st inst. was formally transferred by the Lick trustees to the California State University. The original endowment was $700,000, which with interest brings the sum expended up to nearly $1,000,000. The observatory and instruments are valued at $750,000. The trustees turned over with the observatory property $90,000, all that remains of the fund. This will not bring in more than enough to pay the salary of the director. It is estimated that it will cost $30,000 a year to carry on the observatory, so that a deficit of $25,000 falls on the university. It is doubtful if the institution can furnish this amount, and an attempt will probably be made at the next Legislature to get the State to set aside a fund for the maintenance of the observatory.

Deep Coal Mining.—*L'Echo des Mines et de la Metallurgie* gives details of the deep André shaft of the Poirier Company in the Charleroi district, Belgium. This shaft is 940 meters, or 3084 feet deep, with a sump of 15 meters, making the total depth 3133 feet. The maximum daily output is 500 tons of coal. Hoisting is done in one lift. The load, including weight of cable, cage, six trucks and coal is 15,510 kilograms, and when hoisting rock this is increased to 16,910 kilos. The ascent is made in 80 seconds, or an average of 11·75 meters per second, or about 2320 feet per minute, though in certain positions of the cage 17 meters per second are made. When lowering men the descent is made in five minutes, or 3·13 meters (say 10 feet), per second. The temperature at the bottom is about 35 degrees C. (— degrees F.) and the rate of increase is 1 degree C. in 30 or 40 meters (say 1 degree F. per feet). Ventilation is effected by a Guibal fan delivering 30 cubic meters per second (— cubic feet per minute).

The Long Tunnel for Draining the Valley of Mexico.—A contract has been entered into between the Board of Direction of the Drainage of the Valley of Mexico and Mr. J. Gladwyn Jebb, representing the London-Mexican Prospecting and Finance Company, Limited, for the execution of the work known as the Tequixquiac Tunnel. The work is to cost $2,350,000, covered by 7 per cent city bonds, issued at 82½ and running for at least ten years, the ultimate period of liquidation being fixed at thirty years. A sinking fund of 1 per cent per annum on the total issue is provided for. The limit fixed for the completion of the work is two and a half years, counting from the date of formal transfer of the tunnel to the company, but practically three years are allowed, as it is stated each day over three years employed by the company on the work shall cause a fine of $300 to be deducted from the amount due the company on final liquidation. On the other hand, for each day less than two and a half years saved by the company, a premium of $300 shall be awarded them. It is distinctly stipulated that the money raised by the emission of the bonds shall be devoted exclusively to the tunnel. The total length of the tunnel is 9520 miles, of which there is already completed a trifle less than 1000 miles. There are to be 23 shafts, of which five are already sunk. The tunnel will be brick-lined throughout, with an inner cement coating, and the stipulations of the tunnel contract call for first-class work.

Effect of Copper Oxide on Density of Copper.—Alex. Trippel, M.E., furnishes us the following note: It is a well-known fact that refined copper holds and needs a small quantity of cuprous oxide for its ductility. Generally, however, casting brands have more than copper refined for rolling purposes, for the reason that in crucible melting, copper which does not contain some cupreous oxide is apt to absorb carbon from the covering of the metal bath. The delicate point in copper refining is in recognizing the moment when the minimum quantity of cupreous oxide is reached. The least step beyond produces a copper which is short, from the absorption of carbon. The following experiments were made to ascertain the changes brought about in refining, the result being a casting-brand.

	Per cent. Cu_2O.	Per cent. O.	Spec. gravity.
1. Sample taken soon after slagging	7·91	1·	8·667
2. Sample half hour after first	7·35	0·93	8·695
3. Sample one hour after first	6·40	0·81	8·705
4. Sample before pooling	4 95	0·64	8·715
5. Sample after charcoal on bath	4 90	0·62	8·7·1
6. Sample half hour after pooling	3 16	0 40	8·8 6
7. Sample before ladling	2·05	0·26	8 880

Lead in Water.—From a report on the recent progress in public hygiene by Dr. Samuel W. Abbott to the *Boston Medical and Surgical Journal* we abstract the following: In Sheffield, England, cases of lead-poisoning have been very frequent; during the past winter there has been an alarming increase, the number amounting to several hundred. On inquiry, it was found that these were quite exclusively among the population supplied from the high service reservoir, in the water of which lead was found in quantity varying from half a grain to one and a quarter grains per gallon. This water was found to be distinctly acid, claimed

to be of vegetable origin, arising from the peat upon the moors. To neutralize this acid, and thus prevent its dissolving the lead in the pipes, blocks of limestone have been placed in the conduit by the water company. The public analyst does not approve of this, saying that too much limestone will injure the water, and render it as liable to act on lead as if it had not been thus treated. He advises that the lime be introduced regularly and constantly in powder, or as milk of lime. Charcoal filters have been efficacious in removing the lead, in consequence of the phosphates contained in the animal charcoal used, forming an insoluble phosphate of lead.

Brazilian Coal.—The following is a report upon the properties of the Brazilian coal from Arroio dos Ratos. The examination was made by John Pattinson, chemist to the Newcastle-upon-Tyne city council. On submitting coal to distillation in a coal-testing apparatus 8000 cubic feet of gas was obtained per ton of coal, having an illuminating power equal to 13·8 standard sperm candles, as ascertained by burning the gas at the rate of five cubic feet per hour in a photometer fitted with the No. 1 London Argand Standard Burner. The following percentages of coke and volatile matters were yielded: coke, 58·8 per cent; volatile matters, 41·2 per cent. The coal swelled up but very slightly on being heated in a close retort and formed a slightly coherent coke. A complete ultimate analysis of the coal was made and the following results obtained:

	Per cent.		Per cent.
Carbon	53·84	Sulphur	3·65
Hydrogen	3·91	Ash	17·01
Oxygen	8·23	Water	12·77
Nitrogen	0·59		

The calorific power of the coal was determined in Thompson's calorimeter. This indicated that one pound of the coal would evaporate 10·3 pounds of water from 212 degrees Fahr. or 100 degrees C.

A Ruined City in Texas.—The surveys at present being made for the Kansas City, El Paso & Mexican Railroad, at a point north latitude 33 degrees and west longitude 106 degrees, have passed along the lava flow which by the local population is called the Molpais. It consists of a sea of molten black glass, agitated at the moment of cooling in ragged waves of fantastic shapes. These lava waves or ridges are from 10 to 12 feet high with combing crests. This lava flow is about 40 miles long from northeast to southwest, and from 1 to 10 miles wide. For miles on all sides the country is the most desolate that can be imagined. It has been literally burnt up. It consists of fine white ashes to any depth which, so far, has been dug down. To the north of the lava flow, and lying in a country equally desolate and arid, the surveyors have come upon the ruins of Gran Guivera, known already to the early Spanish explorers, but which have been visited by white men less often even than the mysterious ruins of Paienque in Central America. Only a few people at Socorro and White Oaks have been at Gran Guivera, because it is at present 40 miles from water. The surveyors found the ruins to be of gigantic stone buildings made in the most substantial manner and of grand proportions. One of them was four acres in extent. All indications around the ruins point to the existence here at one time of a dense population. No legend of any kind exists as to how this great city was destroyed or when it was abandoned. One of the engineers attached to the surveying expedition advances the theory that Gran Guivera was in existence and abundantly supplied with water at the time the terrific volcanic eruption took place.

Estimates of Electrical Energy Necessary for Tram Cars.—Mr. Huber, in the *Electrical Engineer*, estimates that the energy required to be stored in the cells in order to draw a load of one long ton, in ordinary weather, over one mile of average road, the gradients on which do not exceed 2½ per cent, on an average, is equivalent to 125 watts exerted for an hour. Calling the daily run 70 miles, and the weight of the car eight tons, it follows that the battery must be of such proportions that it can give out during the run as much energy as is equivalent to $70 \times 8 \times 125 = 70{,}000$ watts exerted for an hour. As this energy is not used during one hour, but distributed through, say, 14 hours, the battery will only need to be $\frac{1}{14}$th of 70,000 watt-power, or 5000 watt-power. If there are 125 cells, each having an electromotive force of two volts, the electromotive force of the battery will be 250 volts, and in order that it may develop the necessary 5000 watts it must give a current of 20 ampères, *i. e.*, $5000 \div 250 = 20$. Ohm's law ($C = E \div R$) shows that if the current is 20 and the electromotive force 250, the total resistance must be 12.5 ohms. Most of this resistance will be in the motor, which should be designed accordingly. It takes 746 watts to equal one horse-power, so that 70,000 watts exerted for one hour is the same as $70{,}000 \div 746 = 93{\cdot}8$ horse-power exerted for an hour. We may assume that the generator gives out 80 per cent of the indicated horse-power of the engine that drives it. The engine would therefore be large enough to be able to exert 117·2 horse-power for one hour, if it did the charging all in one hour, since 80 per cent of 117·2 is 93·8. If the charging of the battery lasts 20 hours instead of only one hour, the engine need be only $\frac{1}{20}$th as large. That is, it will not need to exert more than 5·9 horse-power.

American Gem Stones.—At the last meeting of the New York Academy of Sciences, Mr. George F. Kunz exhibited some of the finest red corundum (ruby) from within 20 miles of Atlanta, Ga. This was in pieces weighing one pound, and was part of a mass weighing 350 pounds, which was found on the surface. He also exhibited gold quartz from Dutch Guiana, gold formerly found there only in placer deposits had been traced to the vein by a brother of the United States consul, Mr. Thomas Brown. The mines are situated four miles from Paramaribo, and the ore is sent to the coast by natives who carry it on their heads in fifty pound bags, making two trips a day. He also read a paper entitled "List of Diamonds found in the United States," which will be published later on by the society, and stated that, in reference to the diamond weighing 4½ carats, exhibited and reported by him two months ago as having been found near Morrow Station, thirteen miles south of Atlanta, Ga., that he had recently heard of a two carat stone which was brought to Mr. L. O. Stevens, of Atlanta, Ga., by a colored man who found it in his garden a few miles from the city, but who would not sell it or allow it to be sent north. It was imperfect and off colored. Mr. Kunz also said that five years ago he had identified topaz for the first time in Maine, at Stoneham, and ever since then he has been on the lookout for the rare gems, phenacite, crystals of which he had the pleasure of showing on that evening. This was the first time it had ever been found in the United States outside of Colorado, where it was first discovered in 1882. In Maine a number of superb light green and sherry-colored topaz crystals were found. They were several inches in length but of little gem value.

Economy of High Pressure Steam Jackets.—According to the *Révue Industrielle*, M. P. Guzzi, an Italian engineer, has recently introduced a system of constructing steam engines in which the jacket is supplied with steam of a higher pressure than that used inside the cylinder. The high pressure steam is generated by a small boiler constructed on Perkins' system, which is placed inside the furnace of the main boiler. In this way steam is obtained at a pressure of about 220 pounds per square inch, with a corresponding temperature of about 390 degrees Fahr., and with this steam the jackets are supplied, and when condensed in these it drains back into the boiler. By this arrangement the initial condensation in the cylinder is materially reduced, with a corresponding improvement in the efficiency of the motor, as the following figures, taken from an engine when working as described above, and when working under normal conditions, show:

	Jacket using steam at a pressure of 176 lbs. per sq. in.	Jacket working under normal conditions.
Date experiment	February 24, 1886.	February 20, 1886.
Duration of test	6 hrs. 18 min.	7 hrs. 11 min.
Mean effective pressure in main boiler	56.6 lb. per sq. in.	56.2 lb. per sq. in.
Mean indicated horse-power	25.9	25.67
Consumption of water per indicated horse-power per hour	19.6 lb.	23.5 lb.

This engine has now been working for about eighteen months, but in other cases, to avoid the risk arising from high pressure steam, it has been proposed to substitute for the steam the vapor of linseed oil, which boils under atmospheric pressure at about 700 degrees Fahr.

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.]

Turning Lathes: A Manual for Technical Schools and Apprentices. A Guide to Turning, Screw-cutting, Metal Spinning, etc., etc. Edited by James Lukin, B. A. Published by E. & F. N. Spon, London and New York, 1888. Pages 160 and Index. Illustrated. Price, $1.00.

A System of Easy Lettering. By J. Howard Cromwell, Ph. B. Published by E & F. N. Spon, New York, 1888. Pages 29. Price, 50 cents.

Uber Niveauschwankungen zur Eiszeit nebst Versuch einer Gliederung des Gebirgsdiluviums. By F. M. Stapff, Dr. Ph.-Weissensee bei Berlin (Erscheint im Jahrbuch d. Kgl. Preuss. Geol. Landsanstalt, 1888). Pages 82 and Index.

Die Verdichtung des Hüttenrauchs. By C. A. Hering, Consulting Mining Engineer at Freiberg, Sachsen. Published by the J. G. Cotta 'sche Buchhandlung, Stuttgart, Germany, 1888. Pages 72 and Index. Illustrated.

Zusammenstellung der im Oberbergamtsbezirke Breslau in Bezug auf den Bergbau geltenden Verordnungen, 1888. Published by the Königliches Oberbergamt, Breslau, Germany. Pages 112 and Index.

A Rigid Earth! Being devoted to Geology as applied to Mining. Embracing a Review of Accepted Theories. By Stephen Barton. J. C. Ward, General Agents, Visalia, Cal. 1888. Pages, 99 and Index. Price, $2.00.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

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

PATENTS GRANTED JUNE 12TH, 1888.

384,246. Steam-Engine. Friedrich Fisher, Des Moines Ia.
384,249. Railroad-Rail Joint. Nathan T. Frame, Jamestown, O.
384,250. Triple-Expansion Engine. Harvey F. Gaskill, Lockport, N. Y.
384,263. Steam-Feed Valve. Lewis T. Kline, Alpena, Mich.
384,268. Friction-Clutch. Anthony Nelson, Boston, Mass., Assignor to James Bennett Forsyth, same place.
385,278. Clay Disintegrator. George Potts, Indianapolis, Ind.
384,284. Gas Pressure Regulator. Charles L. Rowland, Brooklyn, N. Y.
381,286. Steam-Engine Governor. Charles Schmid, Chicago, Ill., Assignor of one half to George Farnsworth, same place.
384,295. Manufacture of Articles from Hydraulic Cement. John W. Stockwell, Portland, Me.
384,308. Rolls for Iron-Rolling Mills. Arthur W. H. Collard, Pittsburg, Pa.
384,313. Sectional Steam-Boiler. John A. Grosboo, New York, N. Y.
384,327. Transportation-Case for Coiled Lead Pipe. Henry J. Miller, Utica, N. Y.
384,330. Valve. George H. Moore, Norwich, Conn., Assignor to Estelle C. Moore, same place.
384,332. Appliance for Rolling-Mills. David B. Oliver, Allegheny City, Pa.
384,336. Water-Engine Valve. George Ross and William Ross, Troy, N. Y.
384,345. Elevator for Ingot-Casting Machines. James B. D'Arcy Boulton, Jersey City, N. J., Assignor to the Solid Ingot Co., of N. J.
384,349. Apparatus for Separating Lead and Base Bullion from Slag. Walter B. Devereux, Aspen, Colo.
384,356. Air-Compressor. William T. Forster, Erie, Pa.
384,410. Furnace Grate. Leonard M. Woodcock, Auburn, N. Y.
384,422. Nail-Machine. Gustavus E. Buschick and Fritz Rautert, Chicago, Ill.
384,424. Stuffing Box. Alexander H. Clark, Fond du Lac, Wis.
384,435. Safety-flange for Railroad Rails. Charles M. Erwin, Birmingham, Ala., Assignor, by direct and mesne assignments, of one half to J. M. Watt and Madison Whipple, both of Washington, D. C.
384,436. Hydraulic Elevator. William T. Fox, Rochester, N. Y., Assignor to the Crane Elevator Co., Chicago, Ill.
384,440. Electric-Circuit Controller. Otto F. Greim, Newark, N. J.
384,485. Governor. H. Herman Westinghouse and Francis M. Rites, Pittsburg, Pa., Assignors to the Westinghouse Machine Co., same place.
384,506. Anti-Friction Bearing for Shafts. William J. Brewer, London, Eng.
384,515. Machine for Making Wire Nails. Henry Essex, Mcadville, Pa.
384,524. Hydrocarbon Burner for Furnaces. Adam Heberer, Alameda, Cal.
384,529. Automatic Air Compressor. George J. Keenan, Chicago, Ill.
384,562. Electric Railway. G. Herbert Condict, Philadelphia, Pa., Assignor to the Electric Car Co. of America, of Pennsylvania.
384,576. Electric Railway. Rudolph M. Hunter, Philadelphia, Pa., Assignor to the Electric Car Co. of America, same place.
384,580. Apparatus for Electric Traction. Edmond Julien, Brussels, Belgium.
384,581. Electric Railway Car. Edmond Julien, Brussels, Belgium.
384,582. Tube-Coupling. Andrew C. Kimball, Providence, R. I., assignor of one half to James D. Anthony, same place.
384,591. Rolling Apparatus. William L. Price, Philadelphia, Pa.
384,594. System of Electric Locomotion. Henry A. Seymour, Washington, D. C., Assignor to the Brush Electric Co., Cleveland, O.
384,595. Mold. Robert Sleeth, Pittsburg, Pa.

THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page* 421.)

This is the result of many hundreds if not thousands of observations: for a long while I had the interior of all pots of slag emptied, leaving a rather thin shell, which it was my custom to examine daily for prills.

In all these cases we find that, in spite of strong columnar structure, and in spite of the strong tendency to form large interlacing crystals in the vugs, solidification appears to take place in smooth parallel layers.

Possibly the crystals are minute at the contact of solid and liquid because growth may occur from numberless points simultaneously, and the growths from neighboring points interrupt each other: while the perfectly smooth surface of contact of liquid and gas offers no points from which new growths may start, and so permits the development of large crystals. It is well known that crystals deposit more readily on rough than on smooth surfaces.

The main axes of growth of ice and iron certainly lie between the blowholes. Whether the position of these main axes initially determines the starting point of the blowholes or vice versa I will not attempt to say: but, once started, the poor conducting power of the tubules and the tendency of solidification to proceed along axes normal to the walls of the mould should both tend to the same result, the tubular shape of the blowholes.

If this be the way in which blowholes form, why are they confined to certain distinct zones? Why does not each individual tubule extend from the shell to the center of the ingot? The explanation is easy. Suppose that our molten iron contains much less gas than it is capable of retaining while molten, yet more than it can retain on solidifying. When the very first layers solidify they become supersaturated with gas and expel the excess: but this may not become gasified, but may simply pass inwards still dissolved, to the adjoining still molten layer. In this way no gas would be evolved as gas till the still liquid layers were actually supersaturated, and the very outer layers might be quite free from blowholes.

But beyond this, during the remainder of the period of solidification many complicated conditions determine whether gas shall or shall not escape at any given moment. Primarily this depends on the solvent power of the metal and on the existing pressure. With gradually falling temperature the curve of solvent power reverses at the freezing point (Figure 15, § 214), introducing a first complication, while the factors which govern pressure are simply bewildering. The pressure depends (1) on the temperature, whose curve reverses during the "afterglow," and perhaps at other periods (§ 224, foot note); and (2) on the available space offered to the gas within the ingot, which depends on the ratio of contraction of shell to that of interior. This in turn is governed by two varying quantities, (1) the ratio of cooling of shell to interior, which constantly changes, and (2) the density of the metal, which probably follows a very irregular curve (Figure 34) even with regularly falling temperature. Beyond this, the rupture of internal partitions, owing to contraction or gaseous pressure, and the bending in or out of the shell of the ingot are liable to affect the pressure. With such complexity it is not surprising that the formation of blowholes now ceases, now begins again, only again to cease.

§ 223. CONTRACTION CAVITIES.—Chernoff considers that it must frequently occur in the solidification of steel that the trunks and branches of adjoining pine-tree crystals completely enclose certain spaces, and prevent all communication between them and the rest of the metal: that as the metal in these spaces cools it must contract, and as its contraction is not fed from without local contraction cavities must arise, and these must be scattered through the ingot. Indeed, in a crystal growing on the sides of the central pipe he finds a cavity which he attributes to contraction (*a*, Figure 29). Where, owing to slow solidification, the pine trees grow slowly, a supply of liquid metal should more easily penetrate to feed these cavities, than where, as at the outside of the ingot, the growth is extremely rapid: on the other hand, when solidification approaches the middle of the ingot we have but a small supply of metal, and of now quite pasty metal at that, to feed these contraction cavities. Hence we should expect the contraction cavities chiefly at the outside and near the center of the ingot: and in this way he accounts for the increased porosity or even friability near the axis of the ingot.[a]

Local contraction may under certain conditions originate cavities near the outside of the ingot: gas would naturally pass into them, first because they are cavities, second because a complete vacuum would initially exist in them: so that we might have two classes of subcutaneous cavities, those originated by gas, and those originated by contraction and then filled with gas. It seems improbable, however, that local contraction often originates subcutaneous cavities. In the first place, the addition of silicon, etc., suppressing the escape of gas, also completely suppresses the subcutaneous blowholes, the central pipe and the porous region about it still remaining: silicon should not prevent local contraction, hence it is not probable that the subcutaneous cavities which it suppresses are true contraction cavities. In the second place the smoothness of the inner surface of ingots and ice bottles which have been partially frozen indicates that the solid growth of the branches and the solidification of the matter between them keep pace with that of the trunks so closely, and that the growth proceeds through trunks so closely adjacent, that none but microscopic cavities would be formed between them. In the third place it is probable that iron actually expands in the very act of solidification, though indeed contracting as the temperature falls still farther: contraction would not occur in any one of these local retreats till the metal in that retreat was distinctly solid:[b] it is very doubtful whether contraction would then actually cause even a microscopic cavity: it would be more likely to temporarily distend the metal.

It is clear that the cavities in the neighborhood of the central pipe are far too large to have been caused by the contraction of matter originally completely enclosed within crystal tree trunks and so shut out from external sources of supply. They are clearly due to the ebbing away of the material which originally existed in the now hollow spaces, and which has later sunk away into the central pipe, as it yawns and widens with the contraction of the already solidified metal between it and the ingot's skin.

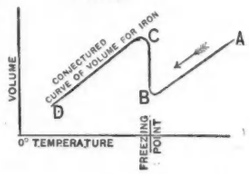
§ 224. PIPING. *The Position of the Pipe.*—Let us neglect for the moment the evolution of gas during solidification and cooling. Iron like other substances contracts in cooling: but during solidification it appears to expand,

[a] Revue Universelle, 2d Ser., VII., p. 140, 1880.

[b] The trunks themselves cannot form till the metal constituting them is at the freezing point, when the metal between them must necessarily be extremely near to that point.

so that its volume follows a reversing curve, whose general form may not be wholly unlike that of Figure 34.[a] In a cooling ingot the changes of volume would follow the

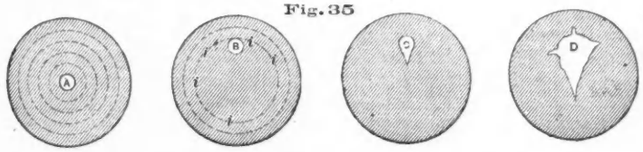
Fig. 34



direction of the arrow, and during any given period the changes of volume of the central part of the ingot would lie in this curve to the right hand of those of the outside. During the first moments of solidification, while the outside is freezing and the inside passing slowly through A B, the outside tends to expand, the inside to contract: later, while the shell is passing quickly through C D and the inside slowly through A B or even B C, the shell tends to contract more than the inside. As the latter is incompressible, it resists and may tear the outside. Later still, when the shell has grown comparatively cool and hence is contracting slowly, the center is passing through B C while the region intermediate between shell and center is passing comparatively rapidly through C D, and so contracting rather rapidly. Eventually a time t will be reached at which the contraction of the region intermediate between shell and center overtakes and begins to outweigh both the contraction of the now slowly cooling shell and the expansion of the small portion of the center which is passing through B C: when this point is reached a cavity or pipe will tend to form. If the shell of the ingot is still hot enough to be plastic, it may bend in and follow up the contraction of the interior, and this will continue till the time t' when the crust becomes too rigid to bend farther. This bending in clearly takes places much more readily in square than in round ingots, and still more readily in oblong ones: and we consequently find that round ingots are more and oblong ones less subject to serious piping than square ones.[b]

In a spherical ingot through whose walls heat is con-

Fig. 35

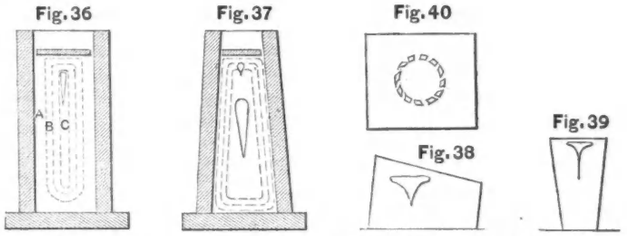


ducted uniformly in every direction, this cavity would lie at the center (Figure 35) but for gravity.

At any instant during cooling we may distinguish a set of isotherms, such as are sketched in broken lines in Figures 35, 36, 37. Solidification follows approximately similar lines. Now the top of the pipe will lie at the top of that layer or isotherm i, (B, Fig. 35), which at the time t' is just too viscid to flow down towards the bottom of the growing cavity. In other words the vacuous bubble will rise through the still liquid layers, and through the slightly viscid ones till it reaches one just too viscid to allow it to rise farther. With further solidification and contraction, as the metal draws apart centrifugally, the still fluid portions flow down to fill the bottom of the growing cavity, whose upper surface remains ever at the same point, (though indeed cracks may rise beyond as at D). But during a later stage the metal is too viscid to flow, and as it still contracts it draws apart somewhat as in C. If the metal contracts a great deal while it is mobile enough to draw apart but too viscid to run down from above to fill the lower parts of the cavity, a deep pipe may arise as at D.

In a prismatic ingot the pipe will lie as in Figure 36: if overturned it lies as in Figure 38: if inverted, as in Figure 39: if rolled over and over during solidification it may be broken up into many pipelets as in Figure 40. Figure 38 tells one disadvantage of heating ingots on their sides in common reverberatory furnaces, instead of on end, as in soaking-pits and similar furnaces. This point is brought out more plainly and probably more accurately in Figure 38 A, which shows the position of the pipe in ingots recently broken at an American Bessemer works, one of

Fig. 36 Fig. 37 Fig. 40



Figures 36-7.—Isotherms and position of pipe in prismatic and pyramidal ingots, the latter exaggerated. Figures 38-9.—Position of pipe in overturned and inverted ingots. Figure 40.—Pipe distributed by rotating ingot during solidification. Figures 38, 39 and 40 from Walrand, Van Nostrand's Eng. Mag., XXXIII., p. 358.

them standing upright, the other lying on its side while solidifying.

In order that the pipe may injure as little as possible of the ingot, it and hence the top of isotherm i should lie as high as possible: in other words solidification should be more rapid in the lower than in the upper part of the ingot, so that the last freezing portion which must hold the pipe may be as near the top of the ingot as possible. Hence the practice of certain American Bessemer works of filling the tops of the rail-ingot moulds above the steel with charcoal or coke dust,[c] and Krupp's plan of keeping the top of the ingot hot,[d] (1) by lining the top of the mould with refractory material, (2) by pouring molten slag upon the molten steel in the mould, and (3) by placing a thick cover of refractory material upon the molten metal or slag: these expedients further serve a special purpose in connection with his mode of compression. Hence too the use of the hot-top sinking head, (§ 227).

To the same end, if the ingot is to be heated or soaked on end, it should be placed in the furnace or pit as soon after teeming as possible, so that as much as possible of its upper part may be molten and so available as a sinking head to flow down and fill the pipe.

(TO BE CONTINUED.)

NOTE.—The publishers of the ENGINEERING AND MINING JOURNAL will thank the readers of this article if they will promptly call attention to any inaccuracies they may observe in it.

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[a] The curve of volume is probably far more complex than that here shown. In the first place, there is at least one reversal of the direction of change of temperature, that of the "after-glow," when, the temperature having fallen to low redness, suddenly rises again, on the change of hardening to cement carbon. In the second place, Chapter XIII. gives evidence that two or more recrystallizations occur during cooling. These may well cause change of volume (for the density of the new minerals may well differ from that of the old), and may indeed cause the absorption or evolution of heat. But it is not necessary to introduce these complications here.

Cf. Adamson and Snelus, Journ. Iron and Steel, 1887, I., pp. 148, 156.

[c] This practice involved so much delay that it has recently been abandoned: the manager believes it more profitable to allow the ingot to solidify rapidly, and to crop off a larger proportion of its upper end on account of unsoundness.

[d] F. A. Krupp, British Patent 2,860, June 30th, 1881.

PERSONAL.

Dr. Carl L. Jensen, the well-known chemist, died in Philadelphia, Pa., this week.

Mr. Frank Nicholson, mining engineer, of St. Louis, Mo., has accepted the general management of the Yuma copper property in Arizona.

Mr. W. L. Baker, superintendent and engineer of the Detroit Bridge and Iron-Works, died at Detroit on the 5th inst., aged thirty-eight years.

Mr. J. D. Dessart, Superintendent of the Standard Works, Connellsville, Pa., has been appointed General Superintendent of the Chartiers Block Coal Company.

The American Society of Civil Engineers will hold its annual convention at Milwaukee, Wis. The sessions will begin June 28th and will continue until July 2d.

The thirty-seventh meeting of the American Association for the Advancement of Science will be held at Cleveland, Ohio beginning August 15th and ending August 21st.

Mr. D. W. Brunton, mining engineer, of Leadville, Colo., has gone to Nevada to make an extended examination of some large gold mines in the southern portion of that State.

Capt. John White, for many years connected with mining matters in Nevada and California, has been appointed superintendent of the Dromedary Mining Company, Grass Valley, Cal.

Mr. Charles Connors, a member of the Mine Boss Examining Board, is likely to be appointed Mine Inspector of the Eighth Bituminous District, Pennsylvania, to succeed Mr. John M. Watt.

Mr. H. W. Lash, formerly with Park, Brother & Co., Limited, of the Black Diamond Steel Works, at Pittsburg, Pa., has been appointed general superintendent of the Carbon Iron Company, at the same place.

The examinations for mine foremen for the several districts of the antracite regions of Pennsylvania will be held on the 25th and 26th inst. The questions asked the mine foremen are 36, and the same rules will prevail as the last time.

Mr. John Bogart, secretary of the American Society of Civil Engineers, and at present State Engineer of New York, has written a very interesting article on "Feats of Railway Engineering" in *Scribner's* for July. The article is elaborately and beautifully illustrated.

There is a vacancy on the editorial staff of the ENGINEERING AND MINING JOURNAL. Applicants should have some literary training as well as practical experience in mining and metallurgy, and should read German and French. Address Managing Editor ENGINEERING AND MINING JOURNAL.

Mr. William Keates died at Leamington, England, May 25, aged eighty-eight years. He was the founder of the copper trade in Lancashire as it at present exists, and was the father of the copper trade in England. For many years he managed the copper works of Holywell and the lead works at Bagillt.

Mr James Lanigan, one of the oldest and most prominent residents of Pottsville, Pa., died suddenly on the 14th inst. He was one of the pioneer coal operators and iron masters of that city, and was intimately identified with the development of these industries, but of late years has been entirely retired from active business.

"Count" Mitkiewitz, who returned to America some time ago, claiming to have obtained from the Chinese Goverment gigantic concessions that gave him the telephone monopoly of that country, coupled with general banking, railroading and mining powers, with his associate Paine, has brought suit against Wharton Barker, of Philadelphia, Pa., for alleged breach of contract.

The trustees of the Illinois State Geological Museum at Springfield have appointed Joshua Lindahl, of Rock Island, curator of the museum, to fill the vacancy caused by the death of Professor Worthen. Professor Lindahl is a native of Sweden, and has lived in this country since 1880. He has held highly responsible scientific positions under the Swedish government, and under that of Great Britain as well, and is said to be eminently fitted for the place.

Mr. William Helme died on the 12th inst., at Philadelphia, Pa., aged sixty-four years. Mr. Helme was interested in the manufacture of gas, and constructed gas works in different parts of the country, and was a member of the firm of Harris, Helme & McIlhenny, extensive manufacturers of gas meters. He was also for many years an active member of the Franklin Institute, and was for a long time a member of its Board of Managers.

The following named gentlemen received the honors of Columbia College School of Mines on the 13th inst:

Degree of Engineer of Mines.—Robert Lawrence Allen, A.M., Frank Edward Hopke, Willard Fisher, Othy Bradley Parker, Joseph Brown Taylor.

Degree of Civil Engineer.—Frank Root Bartlett, George Barry, Claude Nicholas Comstock, Watts Deming Gardner, Octave Britton Hébert, Joseph John Koen, Henry Lipps, Jr., James Maclay, Rudolph Philip Miller, Henry Parsons, George Sydney Percival, Charles Henry Schumann, Edward Van Volkenburgh, Jr.

Degree of Metallurgical Engineer.—Charles Ellsworth Beckwith, Gustav Julius Volckening, Jr.

Degree of Doctor of Philosophy in the School of Mines.—John Isaiah Northrup, E. M., Henry Bedinger Cornwall, A.B., A.M., E.M.

Degree of Bachelor of Philosophy in the Course of Analytical and Applied Chemistry.—George Lewis Baker, Frank Despard Dodge, Walter Albert Dodsworth, Allan Wade Dow, Jerome William Frank, William Denison Jones, Lancaster Morgan, Thomas Slade Perkins, Harry Tower Shriver, Francis Pitt Smith, Jr., Charles Henry Smyth, Edwin Van Dyck, Leo Wampold, Delancey Walton Ward, and Louis Wertheimer.

FURNACE, MILL, AND FACTORY.

Operations at the Western Steel Works, St. Louis, Mo., are about to be suspended on account of dull business.

The Pennsylvania Steel Company expect to begin work on another blast-furnace at Steelton, Md., within a few months.

The Roanoke Iron Works of Virginia have given a mortgage for $5,000,000 on their property to the Norfolk & Western Railroad Company.

The North Star Iron-Works, of Minneapols, Minn., have been removed to Ashland, Wis., and under a reorganization will be capitalized at $150,000.

The Troy Steel and Iron Company, Troy, N. Y., is using oil under the Heine boilers at the new blast-furnace plant and are experimenting with the same fuel for puddling.

Operations have been resumed at the Portage Iron Company, at Duncansville, Pa., after a suspension of three months, owing to a strike. Seventeen furnaces are said to be in blast.

The plant of the Carbon Company, Pittsburg, Pa., is to be turned into a first-class modern steel-works. The erection of two Lash steel melting furnaces has already been commenced.

A patent furnace for drying flattening-stones for use in a glass factory, the invention of Mr. Gluber, of New Castle, is being erected near the Vulcan Iron-Works, New Castle, Pa.

Mr. Geo. D. Whitcomb, proprietor of the Harrison mining machine, Chicago, Ill., reports that the fiscal year closed on the 31st of May, pending which period 123 of the Harrison mining machines were put out.

The employés in the lap weld department of the Pennsylvania Tube Works, Pittsburg, Pa., have accepted a reduction of 8 per cent in their wages. The works have been closed several weeks pending a settlement.

The cyclone pulverizer is being exhibited in London, England, and preparations are making to organize a company there. The machine was described and illustrated in the ENGINEERING AND MINING JOURNAL of April 30th, 1887.

A fire broke out on the 9th inst. in the engine house of the blast-furnace owned by the Mahoning Valley Iron Company, Youngstown, Ohio, and by reason of damage to the heavy blowing engines it was necessary to shut down the furnace.

The Cleveland Rolling-Mills, Cleveland, Ohio, on the 11th inst. announced a reduction of 10 per cent from that date. The notice affects the employés of the Dennen-Martin and Bessemer steel mills, and the rail mill, and the blooming mills.

The Lickdale Iron Company, of Lebanon, Pa., has just started its works, making steel by the Clapp-Griffith process. The capacity is about 1000 tons per week, and will be devoted to making blooms, slabs and billets for nail works and for plate and structural purposes.

The Southern Wire Company, of St. Louis, Mo., which also has a large factory in Pittsburg, Pa., has concluded to move the whole concern to the last-named city. The president gives as a reason for this action that the railroads have frozen them out by high rates to points of consumption and the cost of bringing their crude material to St. Louis.

Messrs. O. P. Cobb, John Cobb and James Greer, of the Cobbs' Iron and Nail Company, Aurora, Ind., have agreed to assign to each creditor of the company $3 worth of par of their paid-up stock in exchange for and in payment of $2 of certified claims against the Cobbs' Iron and Steel Company, provided all creditors accept the proposition.

The furnace of the Clymer Iron Company, about a mile south of Temple Station, Pa., will shortly be blown out. This will then leave only the Topton and Alburtis furnaces in blast between Macungie and Allentown. After the blowing out of the Macungie furnace, at Macungie, in a few weeks from now, the entire hot blast will be torn away and a new and much larger one erected in its place.

The Warren Iron Company has lately blown in the Warren furnace at Hackettstown, N. J. For the week ending June 9th this ran up to 241 tons, of which only 44 tons was gray forge, the rest being 1 X, 2 X and 2 plain. The fuel used was Delaware, Lackawanna & Western coal, with 15 to 25 per cent of coke. The ores were magnetic and Kearney hematite, averaging upward of 55 per cent in the furnace.

All the window-glass factories in Pittsburg, Pa., and the West will close on the 15th inst., in accordance with a resolution adopted at the recent convention. The "shut-down" will continue until September 1st, and longer unless the workers and employers agree on a wage scale for the next "fire."

June 9th, Judge Biddle in the Philadelphia Court of Common Pleas No. 1 delivered an opinion in favor of the defendants in the case of Samuel Huston against E. M. Clark, William Sellers and John Sellers, Jr., and dismissed the plaintiff's bill with costs. An amount of $300,000 was involved in the case. The litigation concerned the Midvale Steel Company, whose works are at Nicetown, Pa. In our issue of April 14th, we referred extensively to this suit.

Users of steam power in New York city should note the following water rates just apportioned by the Commissioner of Public Works. Steam engines, when not metered, shall be charged by the horse-power as follows: For each horse power up to and not exceeding 10, $10 per year; for horse-power up to and not exceeding 15, $7.50 per year each; for each over 15, $5 per year. Water registered by the meter shall be 10 cents per foot.

The convention of the Machinery Constructors of North America has been in session in Washington, D. C. Among the objects which the members of the association desire to promote are the abolition of contract labor, the regulation of the apprenticeship system, and the enactment of a general eight hour law. A resolution was passed unanimously in favor of a radical restriction of immigration. The following officers were elected for the ensuing year: National N. W., P. R. Lyons, New Haven, Conn.; National W. F., Edward Callahan, Cincinnati, O.; National Secretary and Treasurer, Robert P. Creed, Cleveland, O.

The Scovel & Irwin Construction Company has been organized at Nashville, Tenn. It absolves the old firm of Scovel & Irwin, constructors and general supplies, of Nashville. The company will have its principal office at Birmingham, Ala., and an office at Nashville. The powers granting the charter to this company allows it to build and equip all characters of city and suburban railway lines, regular railroad lines, to build water-works, gas plants, blast furnaces, rolling mills, etc. The officers are: Minor Scovel, President; H. S. Jackson, Vice-President; A. M. Irwin, Secretary and Treasurer.

A charter was obtained in the Circuit Court in Richmond, Virginia, on the 9th inst., by Maurice B. Flynn, Dr. R. J. Gatling and others for the incorporation of the "Gatling Ordnance Company." The company will have control of the patents of Dr. Gatling obtained in the United States and foreign countries for improvements in manufacturing steel guns. The capital stock is to be not less than $1,000,000 nor more than $5,000,000. The principal office is to be in Richmond, but the plant will be located in New York. The charter was obtained in Richmond to save the heavy tax imposed by the State of New York.

The Alliance Aluminium Company has been formed in London, England, with a capital of £500,000, for the purpose of manufacturing aluminium, sodium and potassium. The company owns the English, German, French and Belgian patents of Professor Netto for the reduction of aluminium from its compounds, and for the manufacture of sodium and potassium; the processes of Mr. Cunningham for the reduction of the above metals; a process for the manufacture of artificial cryolite by the regeneration of its slags, provisionally protected by the inventor, Mr. Forster, Lonesome Chemical Works, Streatham; a process invented by Professor Netto and Dr. Saloman, of Essen, Germany, by which this metal can be raised to the highest standards of purity on a commercial scale. Exhaustive experiments have been made at the works of Krupp at Essen to test the practical value of the processes, and it is stated that he has the means of making the metal in tons. Instead of beads or marbles, solid chunks of the purest aluminium known, weighing from 5 pounds to 100 pounds (according to the size of the converter), are deposited at every fusion of the ingredients, chief among which are sodium and cryolite. The company has a contract with the owners of the cryolite mines in Greenland to supply it with practically the entire output. It is stated that the patents of the company enable it to manufacture it at considerably less than 1s. per pound.

CONTRACTING NOTES.

Machinery and supplies wanted. See page xiv.

Contracts open will be found on page xix. New contracts this week: No. 923, Pipe, Valves and Building Reservoir; No. 924, Earthern Reservoir; No. 925, Bridge Construction; No. 926, Canal Enlargement and Improvement; No. 927, Cast-Iron Pipe, Castings, etc.; No. 928, Iron Bridge; No. 929, Water Works; No. 930, Water-Works.

The contract for furnishing fuel for the Brilliant station pumping-works, Pittsburg, Pa., has been awarded to the Philadelphia Natural Gas Company at $40,000. Only two bids were received, the other being from the New York & Cleveland Gas Coal Company. Their proposal was to furnish coal and all labor and attention necessary for $39,500.

GENERAL MINING NEWS.

The City of Meridian, Miss., has subscribed $110,000 to the Warrior Coal Fields Railroad, extending from Meridian to Decatur, Ala., and passing through Gainesville and up the Bigbee Valley.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including June 6th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1888.	Tons. 1887.
Marquette, Marquette District	49,757	132,045
St. Ignace, " "	23,545	18,685
Escanaba, " "	119 824	173,177
" Menominee District	150,498	206,168
" Gogebic District	41,582	
Ashland, " "	83,972	142 600
Two Harbors, Minnesota Iron Company, Vermillion District	19 939	39,924
	489,117	712,599

ALASKA.

BEAR'S NEST.—It is reported that the controlling interest in the Bear's Nest mine has finally been transferred to an English company for $1,500,000. Hamilton Smith, Jr., of London, and Henry Janin, of New York, recently went to Alaska in the interest of the purchasers.

ARIZONA.

Mr. Cheney, proprietor of the concentrating works at Harshaw, has secured a lease on the American and old French properties and will reopen both. On the former he is putting up a whim for the better convenience of handling the output from the mine.

PIMA COUNTY.

HENSELEY MINING COMPANY.—The Bonanza, Estrelle, Louise, Indiana and others owned by this company are being worked. Concentrating machinery has been ordered. Immediately on the arrival of this machinery, which will be on the ground within the next three weeks, it will be put in place and the work of concentration begun. The ores to be worked are silver and lead bearing.

CALIFORNIA.

NEVADA COUNTY.

BRUNSWICK GOLD MINING COMPANY.— We have received the following official reported, dated the 6th inst.: The west drift in mine is steadily improving, showing now a ledge of 16 inches, with a well defined foot-wall, and the stringers, heretofore off in the hanging, dipping into the ledge; it is somewhat mixed, but from appearances we shall not have to go very far before we are in solid quartz, as from the formation, and its gradual improvement for the last 50 feet from a mere stringer to a formation 16 inches, shows we are approaching a new shoot entirely. Together with Mr. W. W. Wagoner, M.E, we thoroughly inspected the ledge and situation yesterday, and came to the above conclusion. One sampled and tested by Horn shows $10 per ton. In the east drift we are opened out to the old shaft, which we will use as an air-way and second shaft if necessary. The ledge in the face is small, but formation is good, and no doubt will open out in a few feet. At a short distance back there is a 4-foot ledge which has been stoped.

COLORADO.

In the United States Circuit Court at Denver the case of Keyes vs. the Pueblo and Smelting Refining Company has been concluded. The court held the patent to be valid and that defendants had infringed upon it. The case was referred to a master to establish the amount of damage; meantime, an injunction will issue. This is a suit for infringement upon a patent used in smelting. It is a repetition of the case brought by Keyes and Ahrens in the same court against the Grant Smelting Company in 1882, and which case was practically decided for the defendant, both in the Circuit Court and the Supreme Court of the United States, but upon appeal to the United States Supreme Court, was reversed and sent back for another trial in the Circuit Court.

LAKE COUNTY.

ADAMS MINING COMPANY.—The Denver *Mining Industry* is informed that the indebtedness incurred in putting the property in its present condition, placing new plants of machinery and adding new pumps will be liquidated from the sales of ore by July 1st; that within a very short time dividends can again be resumed, and that development is so well forwarded that the mine need not again be pushed beyond its capacity in the payment of monthly dividends.

MICHIGAN.

COPPER MINES.

The Boston *Transcript* publishes the following corrected figures, which differ somewhat from the figures published in our issue of last week. They represent, within a few tons, the entire Lake Superior output of mineral for May and the first five months of the current year.

	May.		Jan. 1 to May 31.	
Mines.	1888. Tons.	1887. Tons.	1888. Tons.	1887. Tons.
Calumet & Hecla	2,593	2,681	10,983	13,542
Tamarack	631	301	3,120	1,487
Atlantic	236	203	1,175	1,024
Osceola	219	164	1,043	766
Franklin	185	200	898	1,003
Quincy	183	280	1,585	1,161
Huron	129	15	609	380
Copper Falls	92	36	242	369
Central	86	61	472	535
Total 9 mines	4,345	3,941	20,127	20,258

According to the Boston *Transcript* a scarcity of lumber in the copper country at Lake Superior is reported this spring. Contractors have men idle waiting for lumber, and work at the Tamarack Junior, Kearsarge and other mines is delayed by the non-delivery of lumber and timber which the mills agreed to have on the ground a month ago.

IRON MINES.

AURORA MINING COMPANY.—The company reduced the wages 10 per cent, and curtailed its force considerably on the 1st inst. This is caused by the hard times in the ore trade. The Aurora has worked a strong force all winter.

LUDINGTON.—It is stated that a new vein of ore has been discovered, which lies west of the present workings. The vein where cross-cut is eight feet and a half wide.

MONTANA.

BEAVERHEAD COUNTY.

RENA MINING COMPANY.—This company has started up the Rena mine. The shaft is 200 feet deep; the ore will be shipped to Omaha. St. Louis parties are interested in this company.

NEVADA.

ELKO COUNTY.

The new concentrating plant for use at the leading productive mines at Tuscarora, is being hauled into the camps as fast as transportation facilities will allow. It is expected to be in full operation within the next thirty days.

PENNSYLVANIA.

Press dispatches report that the lately disavowed copper mines near Herrietta have been purchased by W. S. Taylor, and will be developed. About 250 tons have already been mined, showing, it is said, a large percentage of copper, with traces of silver.

COAL.

The anthracite coal lands, about four miles to the east of Shickshinny, Luzerne County, which lies on the verge of the Wyoming field, are to be developed by Mr. Charles Parrish and other capitalists, who have organized a company. For many years it has been a question in the minds of experienced mining engineers whether coal existed in paying quantities. It is proposed to open up the tract very thoroughly.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to June 9th.

	1888. Gallons	1887. Gallons.
From Boston	998,782	1,973 730
Philadelphia	48,123,650	64,830,004
Baltimore	1,009 401	3,018 106
Perth Amboy	9,691 264	7,592,782
New York	149,746,571	155,484,598
Total exports	210,469,468	232,899,220

The chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of May, 1888, and during the eleven months ended May 31st, 1888, as compared with similar exports during the corresponding periods of the preceding year, as follows: May, 1888, $3,764,420; May, 1887, $3,987,348; eleven months ended May 31st, 1888, $41,592,503; May 31st, 1888, $41,199,455. The exports from the above-named ports comprise about 99 per cent of the total exports of mineral oils. It is stated on good authority that the distillation of 100 gallons of crude petroleum will yield 76 gallons of illuminating oil, 12 gallons of gasoline, benzine or naphtha, 3 gallons of lubricating oil, and 9 gallons of residuum.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 15.

Statistics.

Production Anthracite Coal for week ended June 9th and year from January 1st:

Tons of 2240 lbs.	1888. Week.	1888. Year	1887. Year
P. & Read. RR. Co.	135,764	2,300,244	3,365,160
Cent. R. R. of N. J.	128,722	2,157,581	2,174,948
L. V. RR. Co.	160,325	2,498,339	3,126,784
D., L. & W. RR. Co.	99,720	2,738,335	2,272,390
D. & H. Canal Co.	75,134	1,853,232	1,648,405
Penna. RR.	80 941	1,738,241	1,336 554
Penna. Coal Co.	30 451	636,442	602,442
Penna. Canal Co.	†13,105	105,780	92,222
Total	724,152	14,026,204	14,568,905
Decrease		542,701	
Increase	15,780		

† Week ending June 2d.

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	12,102,090	1885	11,241,465
1884	11,702 121	1886	12,967,559

Production Bituminous Coal for week ended June 9th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated

EASTERN AND NORTHERN SHIPMENTS.

	1888. Week.	1888. Year.	1887. Year
Phila. & Erie RR.	24	27,465	3,388
*Cumberland, Md.	67 578	1,508,741	1,224,224
*Barton Pa.	2,446	80,728	97,632
Broad Top, Pa.			
H. & Broad Top RR	5,782	165,959	164,203
Clearfield Region, Pa.			
Snow Shoe	1,404	60.034	77,003
Karthaus (Keating)	800	65 680	8[illegible]16
Tyrone & Clearfield	61,078	1,521,953	1,445,440
Tipton	518	26,959	3,276
Alleghany Region, Pa.			
Gallitzin & Mountain	15,757	408,022	495,498
Pocahontas Flat Top Coal.			
Norf'k & West. RR.	30,516	703,497	521,363
Kanawha Region, W. Va.			
Ches. & Ohio RR.	†14,499	795,828	667,463
Total	230,402	5,364,846	4,781,606

* Tons of 2240 lbs. † Week ending May 31st.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.			
West Penn RR.	8,476	175 071	142,069
Southwest Penn. RR.	1,458	45,496	63,990
Pennsylvania RR.	7,485	134,278	93,510
Westmoreland Region, Pa.			
Pennsylvania RR.	27,547	777,434	661,915
Monongahela Region, Pa.			
Pennsylvania RR.	12,140	163,760	168,743
Total	57,106	1,295 930	1,139,227
Grand total	287,508	6 660,785	5,920,833

Production of Coke on line of Pennsylvania RR. for week ending June 9th, and year from January 1st, in tons of 2000 pounds: Week, 76,706 tons; year, 1,728,785 tons; to corresponding date in 1887, 1,564,380 tons.

Anthracite.

This market is heavy and dull, though coal is moving in fair quantity. The market appears to have little life to it, and individual operators, and the Lehigh Valley Coal Company, as well as, perhaps, another of the large companies, still continue to shade prices.

The sales agents held a meeting yesterday; it was not very fully attended. There was some plain talk about the Lehigh Valley prices and a little inquiry as to some of the Reading offers. No decision was arrived at regarding the prices for July, but they are to be settled at the meeting on the 28th of June. It is generally understood that an increase in prices will then be made, especially in broken and egg coal, and probably also in stove coal. Chestnut coal will probably remain as it is. Pea coal, as is well known, does not enter into the arrangement, and it has been freely slaughtered during the past week.

A telegram from Philadelphia to-day says: "The Reading Coal and Iron Company has sent out notices to its customers informing them that no more orders for coal will be received at present prices except for immediate shipment, and that all orders remaining unfilled for any cause whatever, on July 31, will be cancelled, as prices will be advanced the following day."

The inroads which bituminous coal has made upon the pea coal market have resulted in large accumulations of this size with some of the companies, and efforts are being made to move it at the best price obtainable. We hear of as low as $2.25 f.o.b. being asked by some companies, but $2.35 appears to be a not uncommon figure; and yet we learn of sales of a good many thousand tons of the Lehigh pea coal at $2.85 net.

There is some dissatisfaction with individual operators in the Wyoming Valley, who have exceeded their proportion of the output and are thus disturbing the market, otherwise the large companies keep very well to their quotas, and we hear of no complaint on that score.

The production for this year is greater than during the corresponding period in 1887, when it was enormous, as is shown in the statistics published on another page, and there is every prospect of an excellent business during the balance of the year; a better business, in fact, than in 1887, for prices are higher than they were then. It seems to us that consumers who can get their stocks at present prices will be prudent to take them, for an advance will, no doubt, be made and maintained next month.

Bituminous.

We still hear of a fairly good business in bituminous coal, though prices are considerably shaded; thus coal delivered at Fall River alongside has been sold at $3.35 per ton, and some Clearfield coal has sold in this harbor alongside as low as $2.85, while Pocahontas is said to be sold at $3.15 alongside here, a figure which, if correct, would leave about $2.20 f.o.b. at Norfolk.

The effect of these prices is undoubtedly to extend the market for this class of coal, and it has made heavy inroads upon the pea and buckwheat coal market of the anthracite companies.

The Canadian business west of Montreal is very good, but at Montreal and east of that point Nova Scotia coals naturally hold the market, so long as Canada imposes its present duty on entry. Montreal in 1887 imported from Pictou 65,297 tons; from Cape Breton, 277,311 tons; from the United Kingdom, 35,013 tons; from Spring Hill, Nova Scotia, by rail, 75,000 tons, making a total of something over 450,000 tons. Should the duty be taken off the coal in Canada, we could send a considerable amount even as far east as Montreal and greatly increase our exports, in the western direction.

Present price of bituminous coal at Montreal is for Cape Breton coal, $3.20 per ton of 2240 lbs.; Pictou, $3.76, and Scotch coal $4.25.

We continue to quote at our tide-water shipping ports $2.40@$2.60 f. o b.

Boston. June 14.

[From our Special Correspondent.]

No news is good news to the anthracite companies, I suppose, for it indicates here in Boston that the prophecies uttered in some quarters that prices could not be maintained are not being fulfilled, but that every thing is running along smoothly, although quietly. Trade is rather light, but is being done at good figures.

There is very little life to the bituminous coal market just at present. Rumors of cutting continue, and it is certain that some is done, even on straight Cumberland coal; but the market as a whole is not affected to any noteworthy extent. I quote as before; $2 50@$2.60 f.o.b. for outside coal can be had readily at the lower figure or its equivalent delivered. The gas coal movement has been about as usual in volume, but has been very quietly conducted this year on a basis of $4.15 alongside and $4.40 delivered. These figures

have been cut somewhat, but have been pretty fairly maintained. But little tonnage now remains to be placed in this line.

Freight rates are well maintained. An interesting bit of news is the fact that the Baltimore concern which has gone into the coal-carrying business has added to its two barges and a steamer a third barge; that is to say, a large vessel of 1200 tons register has been bought, and is to be fitted as a coal barge at once to run as far east as Boston.

We quote vessel rates, exclusive of discharging: New York, 80@85c.; Philadelphia, $1.05@$1.10; Baltimore, $1.10@$1.15; Newport News and Norfolk, $1.05@$1.10; Richmond, $1.15@$1.25.

The amount of retail trade is very light. Prices are nominally unchanged.

Retail quotations, 2000 pounds to the ton, delivered, are as follows: Stove, $6; Egg, $5.75; Broken, $5.50; Nut, $6; Franklin, $7.25; Lehigh Egg, $6; Broken, $5.75; Bituminous (on the wharf), $4.25.

A new list of pocket prices has been issued, but no change is made, except in Lykens Valley coal, which is marked up to $6 for Broken, $6.50 for Egg and $6.75 for Stove. As there is practically none to be had, prices make no great difference.

Buffalo.

June 14.

[From our Special Correspondent.]

The market has opened with a quiet trade for anthracite coal. There are no new features to report. Prices steady. Stocks ample for local consumption and the supply for shipment by lake westward well kept up.

The bituminous trade very quiet; supply abundant. There are no apparent prospects for improved demand. Manufacturers continue to maintain a conservative course. Prices are now so low that there is certainly no prospects of a further decline. All coals are nominally quoted at the same figures, excepting from the Pittsburg region mines, which are about 25c. higher than the average quotations. The railroad tracks are well stocked with loaded cars awaiting purchasers for the coal contained therein "at prices to suit," as the advertisers have it.

Coke unchanged, with average business. The following paragraph was published in yesterday's Buffalo *Courier:* The Coal Dealers' Association of Central New York was in special session at Auburn, Tuesday, for the purpose of devising measures to prevent private consumers from obtaining coal directly from the mines without the intervention of middlemen," and comments thereupon thus: "The attention of the so-called reformers of the legislature is directed to this pretty combine, which proposes to levy a tax on the fuel consumption of the interior of the State." What do you hear about this subject at your end of the State?

The Erie Railroad has over 1200 men employed in the construction of a double track on its Jefferson branch between Susquehanna and Carbondale, which is its principal coal line. In August, when completed, the operating expenses will be lowered about $50,000 pet annum.

Lake freights steady and business good to Chicago and Milwaukee, but movements light to other parts. The shipments of coal by lake from May 7th to 13th, both days inclusive, 93,520 net tons, namely, 40,550 to Chicago, 41,690 to Milwaukee, 3500 to Duluth, 330 to Bay City, 800 to Green Bay, 1450 to Kenosha, 1080 to Ashland, 1060 to Washburn, 700 to Windsor, 1600 to Racine, and 750 to Saginaw. Total shipments thus far this season (including vessels from Tonawanda not reported at Custom House), 584,500 net tons. The rates of freight were: 85c. to Chicago, Milwaukee, Racine, and Sheboygan, 90@85c. to Manitowoc, 80c. to Green Bay, 60c. to Duluth, Ashland, Washburn and Superior, 50c. to Saginaw, and 35c. to Detroit and Windsor

Canal shipments for first and second weeks in June, 914 net tons: receipts, 9476 net tons.

Canal freights as follows: Two loads coal to Oswego at 60c. net ton, free on and off; asking 50c. for coal-dust per gross ton to Syracuse, free on and off. The nominal rate to New York, $1 per net ton, free on and off; and to Albany or Troy, 80c. per net ton, free on and off.

The following statement shows the movement of coal from this port to Western points from the opening of navigation to June 12th to be about 560,000 net tons, as follows: To Chicago, 226,099; to Milwaukee, 170,337; to Duluth, 70,380; to Sandusky, 5240; to Racine, 8340; to Toledo, 17,735; to Bay City, 1480; to Port Colborne, 30; to Windsor, 700; to Manitowoc, 830; to St. Clair, 400; to Marine City, 550; to Alpena, 600; to Ashland, 2946; to Superior, 26,650; to Saginaw, 2500; to Port Arthur, 750; to Kincardine, 400; to Green Bay, 6060; to Sheboygan, 3740; to Kenosha, 3120; to Port Huron, 220; to Washburn, 6260; to Detroit, 1610, and by Tonawanda vessels, destination not named, about 35,000 net tons.

Cleveland.

The Western Association of Coal Dealers held its annual convention at Cleveland on the 13th inst. Twenty-five of the members have quit the business during the year, because they were unable to compete in their localities with natural gas. The chief topic of discussion was the coal exchange system, which was approved as being the best means of insuring stability of business and fair profits, as well as guaranteeing customers full weight and well-screened coal, and maintaining good wages for miners and employés. The association elected the following officers: President, C. A. Dean, of Detroit; Vice-Presidents, B. M. Baker, of Adrian; L. R. Doty, of Columbus; George H. Howard, of Ontario, Can.; J. W. Lowe, of Chicago; A. B. Meyer, of Indianapolis; Henry E Smith, of New York, and F. R. Layng, of Pittsburg; Treasurer, D. M. Clark, of Elyria; Executive Committee: C. E. Black, of Sandusky; George E. Howes, of Battle Creek, Mich.; D. C. Mather, of Richmond, Ind., for three years; J. W. Wilding, of Fort Wayne, for two years.

Pittsburg.

[From our Special Correspondent.]

Coal.—The dull season is at hand, the Ohio being too low for shipment. River men are waiting for the June rise, which up to this time has failed to put in an appearance. There is yet time, and many predict that there will be one. The season's shipments so far have been large. The low price of coal and competition in the Western and Southern markets have held prices to a very low figure.

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.—Dullness was the rule, not the exception, as far as relates to coke. The "war" among the manufacturers still goes on. There must be an end; the sooner the better. The nominal rates are: Blast-furnace, f.o.b. on cars at ovens, $1 per ton; foundries, $1.15.

Notice has been posted at the works of the Central and United coke companies that, owing to the depressed condition of the market and the fact that other works have reduced wages, they must either shut down the works or reduce wages of employés to the following rates, to take effect June 16: Mining coal, per 100 bushels, 80 cents; headings, 95 cents; mine haulers, $1.68 per day; roadmen, $1.68 per day; trappers, 60 cents per day; drawing coke, per 100 bushels charged, 48 cents; chargers, $1.68 per day; laborers, $1.20 per day.

Freights.—The rates are: To Pittsburg, 80 cents per ton; Chicago, $3; Springfield and Urbana, Ohio, $2.75; Toledo, $2.90; Cincinnati, $2; Indianapolis, $2; all valley points, $1.50; East St. Louis, $3.50; St. Louis, $3.65. Other points same proportion.

FREIGHTS.

Reduction of Pig-Iron Freights.—The executive committee of the trunk line met in New York on the 8th inst., and decided to reduce the rate, east and west-bound, on pig-iron from 25 cents to 20 cents per 100 pounds. The reduction was made, it was said, on account of the dullness of the iron trade.

Eastern Rates Reduced from Youngstown, Ohio.—On the 11th inst, the following reduced freight rates to Eastern points went into effect. They were obtained through the efforts of the recently organized Iron Manufacturers' Association, to which we referred in our issue of May 26th: Albany, $2.50 per ton; New York, $2.70; Boston, $3.70; Philadelphia, $2.30; Baltimore, $2.10.

The latest actual charters to June 14th, per ton of 2240 pounds:

From New York to:—Bangor, .80*; Bath, Me., .90*; Beverly, .90*; Boston, .80*; Bridgeport, Conn., .55; Cambridge, Mass., .80*‡c; Cambridgeport, 80*‡c.; Chelsea, .80*; E. Boston, .80*; E. Cambridge, .80*3c.; E. Greenwich, R. I., .80; Fall River, 75@.80; New Bedford, .80@.83; Newburyport, 95*; New Haven, .55; Newport, .75@.80; Portland, .80*; Portsmouth, N. H., .90*; Providence, .75; Sag Harbor, .75; Salem, .80*.

From Philadelphia to:—Alexandria, .85; Annapolis, .65@.70; Bath, Me., .95@1.05*; Boston, 95@1.05*; Cambridge, Mass., 1.10*; Charleston, .75@.80; Com. Point, Mass., 1.05*; Fall River, .90*; Gardner, Me., 1.00*‡; Gloucester, 1.05*; Lynn, 1.10@1.30*; Milton, 1.20*; New Bedford, .90*; Newburyport, 1.15@1.25*; Norfolk, .60@.65; Portland, .95@1.05*; Portsmouth, Va., .60@.75; Portsmouth, N. H., 1.10@1.15*; Providence, .30*; Richmond, Va., .75@.80; Salem, Mass., .95@1.15*; Savannah, .80@.90; Washington, .85; Wilmington, N. C., .80@.90.

From Baltimore to:—Bangor, Me., 1.10; Bath, 1.10; Boston, 1.10; Bristol, 90; Bridgeport, Conn., .90; Charleston, .70; Fall River, .90; Galveston, 2.90; Gardner, Me., 1.25; New Bedford, .90; Newburyport, 1.30; New Haven, .90; New London, .90; New York, .85; Portland, 1.05; Portsmouth, N. H., 1.10; Providence, .90; Salem, Mass., 1.05; Savannah, .90@1.00; Williamsburgh, N. Y., .85@.95; Wilmington, N. C., .95@1.10.

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

MARKETS.

NEW YORK, Friday Evening, June 15.

Prices of Silver per ounce troy.

J'ne	Sterling exchange	Lond'n Pence.	N. Y. Cents	J'ne	Sterling exchange	Lond'n Pence.	N. Y Cts.
9	4.88¼	42	91⅞	13	4.88½	42⅛	92⅛
11	4.88¾	42 1-16	91⅞	14	4.88½	42 1-16	92
12	4.88¾	42 1-16	92	15	4.88½	42 1-16	92

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 2½ per cent. During the week the bank gained £472,000, and the proportion of its reserve to its liabilities was raised from 41·21 to 42·50 per cent, against an advance from 47·04 to 48·01 per cent in the same week of last year, when its rate for discount was 2 per cent. The weekly statement of the Bank of France shows a loss of 3,500,000 francs gold and a gain of 4,325,000 francs silver

Copper.—The somewhat monotonous condition of the copper market during the last few weeks was altered a little on Thursday last, when the brokers understood to represent the French syndicate rather unexpectedly discontinued further purchases, this being the first sign of hesitation on their part for some time past. On the previous day some large sales were made at 16·60 for Spot and July, 16·50 for August, and 16·35 for September, and at these figures other quantities were still offered. Evidently these people were rather perplexed at the continued offerings, not expecting so much copper still to remain in the hands of parties outside the combination, and therefore left the market alone; but it is understood that they are now again buying Spot and July deliveries at 16·50, that being the price at which the recent pool sale was made to the consumers. The decline in value of Spot Copper has therefore only amounted to 10 points, but futures have given way considerably more than Spot. Let it be understood that sales have been made for September at 16·20; October, at 16·10, and November, @ 16, and at these prices more could probably be obtained. Some isolated transactions have also taken place for the first quarter of next year at about 15·75 but these being of a purely speculative character, have little or no bearing on the present state of the market.

Outside brands have declined to a relatively greater extent than Lake copper, and good brands are offered at 15¼, and might possibly be bought for a trifle less.

Furnace material is also said to be obtainable in limited quantities at slightly lower prices than recently; but it is of course well known that the bulk of this material (including, in fact, the entire output of the large producers) has been contracted for for some time to come. A few days ago cable reports were received from Paris announcing that one of the directors of the Comptoir d'Escompte of Paris (M. Jacques Siegfried) had tendered his resignation of that position, being opposed to the policy adopted by that institution in giving large financial support to the French copper speculators. This may, of course, mean very little if anything, but it is still a rather ominous sign. We don't think, however, that consumers need be at all afraid that the grand scheme is about to break down. On the contrary, we think that every thing has been really so admirably arranged that a collapse need not be anticipated for a considerable time to come, and we think consumers would make a mistake if they allowed themselves to get quite out of stocks in the hope of replenishing same on more favorable terms, as it is quite possible they might then find themselves compelled to pay much higher prices than those ruling at present. In London Chili Bars remain about the same as for some time past, to-day's closing quotations being £82 12s. 6d.@£82 17s. 6d. for spot and £79 10s. for three months prompt.

Private reports from England, however, are not at all encouraging. It appears that it is a very difficult thing to effect sales of copper, and business can only be accomplished by making important concessions in prices. The statistical position also continues to show increasing stocks. Messrs. Henry R. Merton & Co., of London, cable to-day that the increase in visible supplies for the first half of this month will be about 1600 tons. The total visible supplies of copper in Europe are now greater than they have ever been before.

The Boston & Montana copper mine produced in May 2,396,167 pounds of matte, and equal to 1,368,319 pounds of fine copper. The total product from January 1st to May 31st was 5,574,362 pounds.

A special from Boston, dated Houghton, Mich., June 12th, says the Calumet & Hecla output last week was 527 tons mineral.

Messrs. James Lewis & Son report, under date 1st June, as follows: "Although a considerable quantity of furnace material offers much below the price at which the Société des Métaux is willing to sell, it is most difficult to find purchasers, as smelters say they are unable to sell any copper. For Best Selected it is doubtful if £77 could be obtained, except for very small lots in Birmingham, though the official price is still £82.

"With the steady maintenance of the prices fixed by the French operators, it is hoped that consumers will ere long be obliged to come into the market, and so relieve them of part of their large holding.

"It is stated that a contract has been concluded by the French syndicate for a large quantity of Japan copper for delivery over three years.

"The terms of most of the contracts made by the Société des Métaux with the different producers having now been made public, we estimate that of a total production this year of about 275,000 tons, about 175,000 tons have been contracted for by the Société, at an average price to the English companies of about £65 per ton of fine copper, or £70 if delivered as best selected ingots: at 13 cents per lb. (£61 10s. per ton) to the Lake companies, some of them receiving half the excess realized over 13 cents; and 11 cents per lb. (£52 2s. per ton) to the Montana companies. The majority of the contracts are for three years, that with the Anaconda company being for one, but negotiations are pending for an extension to three years. No provision appears to have been made with any of the English companies for a diminution of production, though this has been provided for in some of the American contracts.

"In addition to the copper secured under these contracts, what is known as the 'French Syndicate,' apart from, but acting in unison with, the Société des Métaux, already hold about 45,000 tons of Chili bars, chief part of which were taken over from the Société des Métaux at £64 per ton, but the average cost of which we consider now to be about £70 per ton. As a good deal of Chili copper before arrival and the balance of the shipments thence after arrival are pur

chased by this syndicate, the French operators may be considered to control all the copper to be produced in Chili this year, say 35,000 tons, in addition to the above 175,000 tons, or some 210,000 tons in all. The balance between this quantity and 275,000 tons is represented by the production of European countries, consumed by themselves and not exported; by part of the United States and chief part of the Australian production; and by the product of a number of small mines, the owners of which think it to their advantage to sell in the open market."

The exports ofcopper from New York during the week were as follows:

			Lbs.	
To Liverpool—	Copper matte.			
By S. S. Sirius	Sacks	4,166	488,605	$25,000
By S. S. Ptolemy	"	4,404	509,198	26,000
By S. S. Ohio	Bbls.	110	107,525	5,000
To Liverpool—	Copper.			
By S. S. Wyoming	Pigs	554	189,984	25,000
By S. S. Wyoming	Casks	180	225,000	37,125
To Havre—				
By S. S. La Gascogne	"	237	59,036	8,955
To Liverpool—Old brass in transit.				
By S. S. Wyoming	Casks and Bags	12 / 35	16,649	1,103
To Amsterdam—	Copper.			
By S. S. Edam	Bars	701	112,000	16,750
By S. S. Edam	Cases	60	75,000	9,375

Tin.—The market has been rather sluggish, although the demand on the part of consumers may be regarded as satisfactory. The quantities ordered are so small as to indicate a want of confidence in the future. A further improvement in the statistical position may be expected during this month, as shipments from the East are likely to decrease. At present, however, there are no signs of this metal becoming scarce, and it can not be other than desirable that stocks should decrease, as this would doubtless bring about a more healthy condition of the market. We quote: Spot, 18; June, 18; July, 18; August, 18. London prices have given way during the week a little and are now at about the parity of this market, and the closing quotations are: Spot, £80 5s.; three months prompt, £80 15s.

Lead.—The large drop reported by us last week, bringing domestic lead down to 3·75, has had the effect of stimulating consumers to buy rather freely, and that not only to cover immediate wants, but also for three or four months ahead. Altogether the week's transactions have amounted to upwards of 2500 tons, and this could not fail to produce a better feeling. However, as offerings still continue plentiful, the market closed quieter again, and Spot can be bought at 3·72½ to 3·75; July, 3·75 to 3·77½; August, 3·77½ to 3·80. In London during the week the market was reported firmer, and the price of Spanish lead advanced 2s. 6d. to 5s., up to £12 5s. to £12 7s. 6d., whilst to-day's cable advices again report a dull market.

Messrs. Everett & Post, of Chicago, telegraph us to-day as follows: There is no change of any description in our market. There is but little doing and demand is from hand to mouth only. Offerings are only moderate. Sales will probably foot up 300 tons, at 3·60 for June and July.

Spelter remains very inactive, with little business doing. If any thing quotations may be said to be rather weaker again. We quote: Domestic, 4·50 to 4·55; Foreign, 5¼ to 5·40 nominal.

Antimony.—The makers in England have reduced their prices somewhat, special brands being quoted £44 to £46; other brands £40 to £42, and prices here have also given way somewhat: Cookson's to12½@13; Hallett's to 10c.

Chemicals.—The market for the past week presents few new features. The volume of business has been fair, though nothing outside the jobbing sales that have prevailed so long.

Among the heavy chemicals, carbonated soda ash, 48 per cent., has been fairly active, though most of the sales are for small lots. The spot supply continues light, and consequently the price is well maintained; 1·30@1·35 continues to be quoted by holders as the bottom prices for goods ex store. Goods afloat and for future shipment are still offering at 1·25, but this figure finds few takers, and would probably be shaded to a large buyer. High test remains inactive, and holders are apparently not anxious to sell, as the price continues to be firmly held at 1·20.

Caustic soda ash, 48 per cent, is in the same condition as at our last writing—nothing doing. The stock on the spot continues very light, and prices are still held at 1·30@1·35 for jobbing lots ex store. On large quantities 1·25 is quoted, but in the absence of business this quotation is more or less nominal.

The demand for sal soda continues good and the spot stock very good. Holders are not anxious to push the market at all, and quotations are very firm at 1·25. The prevailing high ocean freights prevent much being done in futures, though there is some little inquiry.

American sal soda is firm in sympathy with the market for English goods, and sales are making briskly; $1.20 for small lots in kegs, and 95c. for goods in barrrels.

Caustic soda has not changed any since our last. The increase in demand for high test has continued, and the market for this brand may be called fair. We continue to quote 2·25@2·30. Sixty per cent. caustic remains very inactive, and we note no change in prices since last writing.

Bleaching powder is also very dull, and we hear of no business of consequence. Boston quotations continue way below New York figures, and the large out-of-town buyers are drawing their supplies from that source. There is no change in quotations, which range from 1·87½@1·95, according to brand, quality, etc.

The market for acids is in the same condition as last week.

Acetic acid is doing fairly well in a jobbing way, but no large sales are reported. The price continues to be held at 2½@2½.

Sulphuric acid, 66 degrees, is steadily held at former quotations. The business done is all in a small way to meet current wants, no sales of importance being noted. Chamber acid is moving steadily on contract orders at old figures.

Nitric and muriatic acids are moving fairly in accordance to consumers' wants, and we hear of no change in quotations.

Oxalic acid is still depressed and unsettled, with very little doing. There is no change in quotations, which are 6½ c. in a large way and 7c. for small quantities.

Fertilizing chemicals have been fairly active and an almost complete depletion of stocks has in some instances resulted in an advance in prices, though it is not likely the present figures will hold long. High grade dried blood is not procurable under 2·30 per unit ammonia; low grade, 2·15@2·20. Tankage, high grade, $22@$23 per ton; low grade, $21. Azotin, 2·15@2·20 per unit. Refuse bone black, good quality, is $17 per ton. Ground steamed bone, light-colored and free of grease, $25@$27 per ton. Fish scrap f.o.b. factory, $25 per ton. Sulphate of ammonia, $3.20@$3.25 per cwt.

High-grade sulphate of potash is selling well at 2·05@2·10 on basis of 90 per cent sulphate of potash.

Muriate of potash is doing fairly well, with no change in quotation, of 1·80 for spot, 1·77½@1·80 for prompt delivery, and 1·75 for sail shipment.

Double manure salt is not very active, and offerings are freely made at our former quotations of 1@1·10c. without attracting much attention.

Kainit is very active, and the small quantity now in store is firmly held at $11 per ton. Considerable interest has been manifested in futures, and we note a considerable volume of business. The price in futures remains firm at $9 per ton.

Brimstone is very scarce and the market closes firm; $27 per ton is demanded on the spot for best unmixed seconds. The available spot supply is somewhat less than 300 tons, and little or nothing on the way that has not been sold. Futures are not now very active; $23 per ton is quoted for June shipment and $22 for July.

Nitrate of soda is quiet, but the price is well maintained at 2·07½ for goods ex store. The available stock on the spot aggregates some 30,000 bags, but even this stock has not resulted in a weakening of holders' ideas. Futures are in some demand at 2·05.

Arsenic, white, is quiet, the business transacted during the week being mostly of a jobbing character. No change in prices is noted, the quotations remaining firm at 3¼@3½.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 15.

The iron market is unquestionably in a very apathetic condition, and yet if we look into the statistics of the trade or the volume of consumption, there is nothing to justify the discouraging reports that are circulated. There are, however, some explanations that are occasionally heard.

First, there is some question whether bottom has been reached in Lake iron ore prices and in railroad freights, though since the reduction by the Pennsylvania Railroad this latter must be considered near bottom.

Second, the political question exerts a greater influence in the iron trade than in any other industry, perhaps, because the great majority of iron makers are Republicans, and all are, naturally, in favor of protection.

It is thought that the argument, that if the work men are shown the depressed condition of the market, "due to the talk of free trade," and are given to understand that if Cleveland is re-elected they must be prepared to accept much lower wages if the works do not close down altogether, while "if Mr. Blaine is elected wages will be advanced and every thing will boom again," may be a very useful one in a political way, and that even a sudden spurt in the market on the nomination of Mr. Blaine (which seems to be conceded) might be used as an illustration of what may be expected should he be elected. All of which we cite merely to show what is said in the trade to explain a dullness which statistics do not account for.

We do not anticipate any advance in prices for some time, for "tariff tinkering" is always an unsettling element in the market and "a presidential year" always an "off" year in business. When the result is known, no matter who is elected, business will revive, but it can scarcely be expected to do so much before that event.

We hear very little of Southern iron since the Thomas Co. dropped prices so suddenly to their present standard. Notwithstanding the low cost at some Southern furnaces, they are not going to close all the Northern furnaces just yet. The following are the latest rail rates on Southern iron:

	Cincinnati.	Louisville.
From Dayton, Tenn	$1.70	$1.70
" Chattanooga	1.90	1.90
" Birmingham	2.40	2.15
" Rising Fawn	2.15	2.15
	Buffalo.	Chicago.
From Dayton, Tenn	$3.70	$3.20
" Chattanooga	3.90	3.40
" Birmingham	4.15	3.65
" Rising Fawn	4.40	3.65

A better demand for consumption is reported here and manufacturers carrying extremely light stocks.

Scotch irons still come in small quantity, though there is no profit in them, either here or in Scotland, where nearly all the furnaces are run at a loss.

All kinds of manufactured iron are quiet, with unchanged prices, though in structural iron and steel the demand is quite active.

Steel rails continue to sell in fair amount. We hear of sales which during the past two weeks have aggregated about 60,000 tons. This week we hear of orders aggregating about 30,000 tons to Southern roads.

Up to May 1st the mills had sold 820,180 tons, and the sales at the present time must be fully 880,000 tons, which looks well for the year's business, notwithstanding the reported dullness of the market. Prices are unsatisfactory at $30 at Eastern mills.

Current quotations will be found in our weekly register on another page.

Louisville. June 14.

[Reported by HALL BROTHERS & Co.]

The same general conditions prevail, with the exception of an increased number of orders. While the sales during the past week have been greater in number there has been no large orders of special mention. The principal demand has been mail orders for carload lots and up to 200 or 300 tons, although there can be nothing encouraging said as to prices. While some furnaces express the opinion that there must be a change for the better in the near future, yet the buyers adhere to their belief that prices will still go lower, which belief is confirmed by their placing orders only for immediate or near by delivery. Quotations for cash f.o.b. Louisville, will be found in our weekly register of prices.

Philadelphia. June 14.

[From our Special Correspondent.]

The action of the Pennsylvania Railroad Company in reducing pig iron freights 20 per cent has not as yet produced noticeable results, but negotiations were begun on Monday and Tuesday for large blocks of Pennsylvania and Southern iron. The chances are against Southern irons getting in here in large lots. Buyers here are merely taking quotations. Brokers who are on the inside do not think the present inquiries will result in much business. Prices are no weaker. Choice lots and standard lots of No. 1 foundry are being taken almost every day to cover current wants. The output is not more than can be sold except in a few brands of inferior irons. A further adjustment of freight rates is expected. Stocks are low in mill and foundry yards.

There is more or less talk of orders going South, but it is difficult to find evidence to convict. Users of foreign material are in no hurry to place orders, especially as vessels are scarce. The home supply is low in price, prompt deliveries are made, and there is no inducement to go abroad. Muck bar orders this week reached the average for the busy season.

The bar-mill people throughout the State are quite anxious over the wages question at Pittsburg. Trade conditions and prices are unchanged. A few consumers are making purchases for July. The mill owners have not decided how long they will shut down. Each is anxious to hold what little trade he has. Prices are weak.

The only activity is in a few interior mills furnishing car iron. Several good-sized skelp-iron orders have been placed and the requirements have not been fully covered. The low prices are likely to attract business.

Tubes and pipes have been contracted for for summer delivery, but there is no improvement in prices. Discounts remain unchanged. There is said to be a large amount of wrought pipe business in sight. Nails are quiet and manufacturers say there will be very little improvement until July. The smaller sheet iron buyers have been supplying July and August wants, but the larger buyers have done nothing beyond taking small lots. Plate mills are gradually getting into better shape, and buyers who want iron within a few days after ordering it find they have to wait. Prices continue low, and as a good deal of business has been held back, mill owners feel more hopeful for the next two months.

The structural mills are all busy, but all are anxious for more business. The large requirements heard of frequently come into market all broken up into small orders, but they keep the mills going. No change in prices. The merchant steel output is large. Steel rail orders at mills represented here are for small lots at old figures, and there is no movement in sight of large lots. Makers say they know of considerable railroad building to be done this year for which rails have not yet been ordered. The holders of old rails are hanging for prices that buyers will not pay, except for just enough to keep going. Choice and selected scrap is selling very well. Quotations will be found in our weekly register of prices.

Pittsburg. June 14.

[From our Special Correspondent.]

The iron market since our last has exhibited but few changes. The trade has seldom been in a more unsettled state, with no improvement looked for until the iron scale is settled for the coming year. How that matter will be arranged no one can tell whether there will be a strike or not.

The question is an important one, and should a strike be inaugurated it will cost a large sum of money and bring idleness to many thousand workmen, and no one can tell when the end will come, as both sides have no doubt prepared for the conflict. As relates to prices there is no doubt that the position is unusually sensitive, and that a very little change in the proportion between supply and demand would be likely to influ-

ence quotations favorably or the reverse. Developments in the near future therefore will be looked for with much interest. There are two views of the position. Which will prove to be the correct one can not be clearly discovered at present. Those favoring the more hopeful side point to the increased demand for some days past. The other view is that the recent activity is a mere incident in an otherwise dull market, and is nothing more than a spurt before relapsing into midsummer dullness. The fact that prices remain stationary or shaded down on good sized lots shows either a lack of confidence or a desire for business that scarcely accords with the sanguine expressions that have been made. Coke—present prices $1.00@$1.15 for blast-furnace, and foundries are certainly satisfactory to the purchaser if not to the manufacturer who fail to obtain first cost for that matcrial. Of course there will be a change, out when is the question. Freights by rail from lake ports have further declined, very much to the satisfaction of parties interested.

Coal and Coke Smelted Lake Ore.

1000 Tons Bessemer	16 80 cash.
1000 Tons White Bessemer	15.75 4 mo.
500 Tons No. 3 Bessemer	16.75 4 mo.
200 Tons Low Phos. Bessemer	22.50 cash.
500 Tons Gray Forge	14 25 cash.
500 Tons Bessemer	16 75 cash.
50 Tons Bessemer	17.00 cash.
50 Tons White Bessemer	14.00 cash.

Coke, Native Ore.

100 Tons Gray Forge	14 50 cash.
50 Tons Silvery	16.75 4 mo.
50 Tons No 1 Foundry	16.75 4 mo.
50 Tons White and Mottled	13.75 cash.
50 Tons No. 1 Foundry all one	17.00 cash.

Muck Bar.

500 Tons Neutral	26 50 cash
500 Tons Neutral	26.00 cash.
300 Tons Neutral	26.50 cash.

Slabs and Billets.

750 Tons Nail Slabs, at makers works	27.75 cash.
500 Tons Billets	28.15 cash.
1000 Tons Nail Slabs	28.00 cash.

Steel Scrap.

2000 Tons Steel Scrap	17 25 cash.

Crop Ends.

2000 Tons Selected Rail Crops	18.50 cash.

Steel Wire Rods.

500 Tons American Fires	42 25 cash.
500 Tons American Fires	42 50 cash.
500 Tons American Fires	42.00 cash.

Old Iron Rails.

1000 Tons American T's	21.50 cash.
1000 Tons American T's	21.75 cash.

The sales this week show a variety of prices; all being from responsible parties can be relied on.

FINANCIAL.

NEW YORK, Friday Evening, June 15.

There has been an improved condition in the market this week, and more attention has been directed to mining stocks, in consequence the transactions have been larger, as compared with previous weeks; but prices show an advance only in a few instances.

One sale of Plymouth Consolidated is reported at $9.

The Quicksilver stocks show a small business. Preferred has declared a dividend of $64,500. The stock advanced in consequence from $35.25@$37; Common at from $9.50@$10.

Brunswick shows one sale at 15 cents.

Nothing is doing in the Bodie stocks. Bodie Consolidated is quoted at from $2.40 to $2.45, and Bulwer at from 72 cents to 85 cents.

Amador and Middle Bar were active, showing an upward tendency. The former went from $2.30 to $2.50, and the latter from 39 to 50 cents. Hollywood has not yet gained favor and was quiet at from 30 to 34 cents.

Taylor Plumas is selling at 1c. Mr. L. L. Levy, the secretary, informs us that the stock which is now sold at this price is worthless. It has been forfeited for non-payment of assessment, according to the clearly stated stipulations printed upon the back of the certificates.

The real stock is sold at five or six cents a share. He states that, owing to strong antagonism, it is not allowed to regularly record these sales on the list. The company does not intend to levy another assessment at present; it needs only a few hundred dollars to resume operations at the mine.

From another source we learn that an attempt has been made to have the stock stricken from the list of the Consolidated Stock and Petroleum Exchange. It is said that the stock, which the officers say is forfeited, can not be forfeited unless it is sold by the sheriff for debt.

A sudden boom struck Sutro Tunnel to-day when it was learnt that several days ago the foreign syndicate signed the agreement to purchase the remainder of the bonds offered by the company. This report created considerable excitement, and some 15,000 shares changed hads in fifteen minutes. The price advanced from 16 to 21c. A sale of one share of Sutro, assessment paid, at 73c., is reported.

Consolidated California was firm at from $9.25@$12. Little was doing in the other Comstock shares. Ophir shows an advance from $6.75@$9, and Bullion declined from $1.80@$1.25.

Considerable activity continues to be displayed in Barcelona, and the price again shows an advance, going from 93c. to $1.15.

Among the Tuscaroras Navajo showed the largest business, with a declining tendency going from $1.90 to $1.50. North Belle Isle was quoted at $3.

The Little Chief Mining Company has just declared a dividend of 10 cents per share, or $20,000. We are officially advised by the company that the mine is being worked on royalty leases at present. The dividend just declared is partly profits; the remainder is a portion of the amount lately realized from the suit with the Little Pittsburg Consolidated Mining Company. The cash balance at present is over $50,000, and after paying the dividend the company will have $30,000 in the treasury. In consequence of the "divy" the stock advanced from 28 to 37c. One sale of Little Pittsburg is reported at 16c. A few of Silver Cliff at 9c., and of Security at from 5 to 8c. Of Lacrosse and Cashier at 10c.

We are officially advised by the President of the Silver Mining Company of Lake Valley that the statement published in our last issue in reference to this company was not quite correct. The dividend is declared from net earnings. The laws of New Mexico only allow dividends from this source. The amount of cash in treasury after payment of dividend will be nearly 25 per cent more than voluntary assessment, and the policy of the company will be to keep a large reserve. The stock is held almost entirely in Philadelphia and not in New York, and the company has therefore no idea of changing its office to New York. No sales of the stock were made his week.

Ontario holds its own at from $29.75@$30.50. Horn Silver is quoted at 80c.

The Homestake Mining Company has just declared its 119th dividend, amounting to $25,000. The stock sold this week at $10.50. Father de Smet appeared on the list at 43c.

Silver King shows one sale at $4.

Some attention was again shown Proustite, which ruled at from $1.10@$1.15. Shoshone was quiet at 11@14c. Castle Creek at 9c., and Holyoke at 5c.

San Sebastian was again quite active at from 87 to 89c.

Rappahannock was firm at 13c.

El Cristo shows a further decline, going from $1.50 to $1.30. In our mining news we publish a letter from the superintendent at the mines, which will be of interest to many.

At the election of the officers of the Consolidated Stock and Petroleum Exchange, held on the 11th

IMPORTATIONS AT NEW YORK FROM JUNE 6 TO JUNE 12, AND FROM JAN. 1 TO SAME DATE.

Spelter.	Week. Tons.	Year. Tons.
American Metal Co., Lt.		236
Friedensville Zinc Co.		24
Lewisohn Bros.		33
Naylor & Co.		75
Osgood, F.		43
Perkins, C. L		725
Total		1,134
Corres. date 1887		1,798

Zinc Sheets.	Tons.	Tons.
H. Lemanche's Sons		594
Naylor & Co		25
Total		619

Nickel.	Lbs.	Lbs.
McCoy & Sanders	15,300	138,166
Total		124,866

Antimony.	Casks.	Casks.
Total	38	1,461
Corres. date 1887	55	1,894

Pig Lead.	Tons.	Tons.
Hendricks Bros		100
Total		100
Corres. date 1887		60

Pig-Iron.	Tons.	Tons.
Abbott & Co., Jere		600
Baldwin Bros. & Co		103
Bartlett & Co., N. S	100	2,600
Crocker Bros		4,780
Crooks & Co., R		700
Dana & Co		400
Downing & Co		51
Drum'nd, McCall & Co.		20
Erie Despatch		250
Henderson Bros	109	1,075
Holt, H. N		50
Lee & Co., James		300
Milne & Co., A		796
Naylor	230	960
Pierson & Co		15
Sanderson & Sons		2
Stetson & Co., G. W	200	9,947
Walbaum, W. H		200
Williamson & Co., Jas.		2,003
Total	630	24,746
Corres. date 1887	1,668	60,595

Tin.	Tons.	Tons.
Abbott & Co., Jere		3,448
American Metal Co		35
Birdwell & French		44
Crooke S. & R. Co	11	109
Dickerson, Van Dusen		10
Hendricks Bros		95
Muller, Schall & Co	112	1,528
Naylor & Co		696
Phelps, Dodge & Co		381
Pope's Sons & Co		57
Schwarer Bros		7
Thomson & Co., D	11	152
Total	134	6,558
Corres. date 1887		4,945

Tin Plates.	Boxes.	Boxes.
American Metal Co	160	301
Bruce & Cook	110	44,383
Byrne, James	968	15,750
Central Stamping Co.		12,356
Coddington & Co., T. B.	4.192	72,894
Corbierre, Fellows & S.		1,332
Cort & Co., N. L	744	52,058
Cons. Fruit Jar Co		849
Crooks & Co., Robert	208	29,827
De Mill & Co., H. R	611	7,086
Dickerson, Van Dusen	5,300	122,049
Doily, T. G. F		112
Iron Clad Mfg. Co		81
Lalance & Gro-jean		893
Lombard, Ayres & Co.		5,978
Merchant & Co	200	6,440
Mersick & Co., C. S		5,853
Morewood & Co., G		15,239
Naylor & Co		8,899
Newall Bros		158
Phelps, Dodge & Co	8,873	214,442
Potts, W. A., Son & Co.		573
Pratt Mfg Co	7,131	74,354
Shepard & Co., Sidney	700	67,303
Stroud & Co		342
Taylor, N. & G.		295
Thomsen & Co., A. A		65,275
Warren & Co		1,065
Wheeler & Co	95	908
Whittemore & Co., H.	546	33,127
Wolff & Reesing		14,507
Wright & Sons, Peter		165
Total	29,838	872,598
Corres. date 1887	64,349	875,668

Steel & Iron Rods.	Week. Tons.	Year. Tons.
Abbott & Co., Jere	105	5,401
American Screw Co		748
Bacon & Co		109
Carey & Moen		360
Cohn, M		60
Dana & Co	5	1,071
Downing & Co., R. F		137
Galpin, S. A	100	2,110
Heyn, A	74	1,089
Hugill, Chas		33
Jacobus, E. Y		12
Lezard Freres	77	327
Leng, J. S		17
Lundberg, Gustaf		120
Milne & Co., A		1,408
Montgomery & Co		48
Muller, Schall & Co		150
Naylor & Co	450	10,031
Newton, & Shipman		2
N. Y. Barb Wire Co		20
Page, Newell & Co		152
Pierson & Co		10
Pilditch, F. S		11
Prosser, Thos		20
Roebling's Sons, J. A	62	1,258
Sanderson & Son		67
Sheldon & Co., G. W		11
Walschid C. A		15
Washburn Mfg. Co.		35
Whittemore & Co.		1,700
Wolff & Co., R. H	133	701
Total	1,056	29,079
Corres. date 1887	3,322	61,509

Steel Sheets, Billets, Forgings, etc.	Tons.	Tons.
Abbott & Co, Jere		1,311
Arkell, Jas		17
Bowker, C. F	3	194
Bruce & Cook		7
Carey & Moen		24
Carter, G. T		273
Cohn, M		83
Co ney, D. J		20
Crooks, R. & Co		561
Crousbey, H		236
Dana & Co		51
Downing & Co., R. F		207
Henderson Bros	5	30
Holt, H. N		6
Hondolette & D	18	86
Hugill, Chas	6	85
Lalance & G. Mfg. Co.	25	192
Lazard Freres		50
Leng, J. S		22
Littlejohn, Jas		40
Mersick & Co		124
Milne & Co., A	50	884
Montgomery & Co.		33
Moore's Son & Co		25
Muller, Schall & Co		5
Manas, J. & Son		10
Naylor & Co	274	3,700
Newton & Shipman	2	34
Ogden & Wallace		181
Phelps, Dodge & Co		3
Phœnix Steel Co		20
Pierson & Co	229	520
Pilditch, F. S		137
Power, C. W		35
Prosser, Thomas	159	1,471
Roebling's Sons, J. A		224
Sanderson & Son		40
Shotts Iron Co		15
Strouse & Co		25
Temple & S		6
Union Bridge Co		287
Wagner, W. F	12	460
Walbaum, W. H		2,479
Walschid, C. A		
Wallace, W. H & Co		15
Whitney & Co		27
Wilson, J. G	5	3
Wetherill & Co		2
Wolff, R. H	11	119
Wright's Sons & Co		10
Total	797	14,525
Corres. date 1887	1,244	37,416

Bar-Iron.	Tons.	Tons.
Abbott & Co., Jere		1,471
Abeel Bros		3
Bacon & Co		13
Downing & Co		50
Jacobus, E. Y		11
Lilienberg, N		5
Lundberg, Gustaf		112
Milne & Co., A		95
Naylor & Co		25
Page, Newell & Co		122
Philip, C. M		20
Wallace & Co., W. H		12
Wilson, J. G		7
Totals		1,946
Corres. date 1887	134	4,463

Old Rails.	Week. Tons.	Year. Tons.
Baldwin Bros		100
Bowening & Archibald		100
Brown Bros. & Co		668
Crossman & Bro., W. H		1,005
Frankfort, M		100
Geisenheimer & Co		100
Henderson Bros		457
Neumark & Gross		1,512
Stetson & Co., Geo. W		230
Waltam & Co		300
Winter & Smillie		80
Total		5,032
Corres. date 1887	3,160	95,713

Sheet Iron.	Tons	Tons.
Coddington & Co	25	1,065
Newton & S		4
Wagner, W. F		40
Whitney & Co		5
Total	25	1,114
Corres. date 1887	26	1,100

Scrap-Iron.	Tons.	Tons.
Brown Bros. & Co		50
Burgess & Co		172
Crossman, W. H. & Co.		47
Geisenheimer & Co		565
Gerhardt, P. T		8
Muller, Schall & Co		15
Neumark & Gross		321
Purdon & W		75
Trowbridge & Co., D		75
Ward & Co., J. E		100
Total		1,398
Corres. date 1887	274	11,524

Charcoal Iron.	Tons.	Tons.
Abbott & Co., Jere		3
Lundberg, G		16
Mersick & Co		10
Milne & Co		15
Muller, Schall & Co		2
Naylor & Co		25
Page, Newell & Co	56	307
Sanderson & Son		1
Total	56	379
Corres. date 1887	274	11,524

Spiegeleisen.	Tons.	Tons.
Abbott & Co., Jere		205
Arkell, Jas		28
Crocker Bros		1,248
Dana & Co		251
Geisenheimer & Co		203
Jansen, J. A		9,903
Naylor & Co	213	5,518
Perkins, C. L		2,443
Pierson & Co		1,045
Total	213	19,249
Corres. date 1887	1,970	45,004

Iron Ore.	Tons.	Tons.
De Flores, R	696	4,413
Earnshaw, A		4,670
Ennis & Co		1,721
Johnston & Co		300
Naylor & Co		3,706
Wright, Chas. L. & Co.		1,630
Total	696	16,440
Corres. date 1887	1,800	22,814

EXPORTS.

Copper.	Week. Pounds.	Year. Pounds.
Abbott & Co	257,572	4,927,612
Amer. Metal Co	270,000	4,121,300
Becker, & Co., H.		1,250
Bridgpt. Copper Co		112,000
Copper Queen		224,034
Herold, Emil		250,000
Ismay, J. Bruce		115,000
Jones, R. W.	189,984	189,984
Ledoux & Co		110,576
Lewisohn Bros	108,750	4,860,254
Lomal, F. A		2,691,293
Meade, R.		560,000
Mendel, S		1,105,000
Muller, Schall		126,143
Neumark & Gross		349,881
Orford Co		67,500
Parsons & Co		230,664
Phelps, Dodge		1,282,530
Pope's Sons		112,026
Todd & Co		
Total	826,306	20,950,797
Corres. date 1887		5,659,047

Copper Matte.		
Abbott & Co		601,145
Amer. Metal Co.,	107,525	1,126,822
Ledoux & Co		469,720
Lewisohn Bros		1,126,822
Nichols & Co		516,783
Wilm's, Verhune		27,605,648
Total	107,525	31,392,838
Corres. date 1887		12,753,495

WEEKLY REGISTER OF

CURRENT QUOTATIONS.

CHEMICALS.

Acid—Acetic ....2⅝@2½
Muriatic, 18°, per 100 lbs 1.20
Muriatic, 20°, per 100 lbs.... 1.35@1.50
Nitric, 36°, per 100 lbs ..... 4.50@5.00
Nitric, 42°, per 100 lbs.... .. .... 6.00
Oxalic....6¼@7
Sulphuric, 60°, per 100 lbs..... .. 90
Sulphuric, 66°, per 100 lbs 1.10
Alkali—36 p. c..... .. 1.10@1.15
48 p. c .....1.22½@1.25
Refined, 58°..... 1.15
Alum—Lump, per lb..... ..... 1¾
Ground, per lb..... 2½
Lump per ton, Liverpool £5
Sulphate of Alumina, ₱ ton....£3 15
Aqua Ammonia—18°, ₱ lb..... 4
20°, ₱ lb..... 5
22°, ₱ lb..... 6¾
26°, ₱ lb..... 9¾
Ammonia—Sul., per 100 lbs. 3.00@3.50
Carb., per lb..... 7¾
Muriate, per lb..... 7
Arsenic—White, powdered, ₱ lb.3¼@3½
White, glass..... .. 6½
Red. per lb ....
White, at Plymouth, per 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 $30.00
Barytes—Sulph., Am. prime white16.00
Sulph., foreign, floated, p. ton....19.00
Sulph., off color, p. ton 12.50
Carb., lump, f. o. b. L'pool, ton ...£6 0 0
No. 1, casks, Runcorn " "£4 10 10
No. 2, bags, Runcorn " " 3 15 0
Bleach—Over 35 p.c., ₱ lb.1.82½@1.95
Borax—Per lb 7¾
Refined at Liverpool, per ton..... £31
Brimstone—*See Sulphur.*
Bromine—Per lb 36
Cement—Rosendale, per bbl..... 1.00
Portland, American, per bbl.... . 2.00
Portland, foreign, per bbl.... .... 2.25
Chalk—Per ton..... .... 3.00
Precipitated, per lb..... 4
China Clay—English, per ton....18.50
Southern, per ton 13.50
Chrome Yellow—Per lb 8
Cobalt—Oxide, per lb..... 270
Copper—Sulph. English Wks ,ton £23
Precip., Eng. Wks, unit . ..fluctuating
Copperas—Common, per 100 lbs.$ 65
Best, per 100 lbs..... .. .. 1.00
Liverpool, per ton, in casks, £1 16 1.20
Cream of Tartar—Am. 99%....32@32½
Powdered, 99 p c 33½
Emery—Grain, per lb 4
Flour, per lb 2½
Feldspar—Ground, per ton....14.00
Fuller's Earth—Lump, per bbl. 95
Powdered, per lb 2
Gypsum—Calcined, per bbl.... 1.25
Iodine—Resublimed..... 3.00
Kainit—Per ton..... ....11.50
Kaolin—*See China Clay.*
Lead—Red, per lb 6
White, American, in oil, per lb.... 6½
White, English, per lb 7½
Acetate, or sugar of .....13@13½
Lime Acetate—Amer. Brown.1.50@1.55
" Gray.2.37½@2.40
Litharge—Powdered, per lb ..... 6@6¼
English flake, per lb..... 9
Magnesite—Greek, per ton.... .10.00
Manganese—lump, c. i. f. L'pool.£ 15
Per unit, up or down . . .. 1s. 6d.
Ground £5 10
Mercuric-Chloride—(*Corrosive Sublimate*) per lb 55
Mineral Wool—Per lb..... 2
Mica—
In sheets according to size, 1st quality, ₱ lb..... ....25@$6 00
Phosphate Rock—S. Carolina, per ton f. o. b Charleston..... 5.80
Ground, f. o. b. New York..9.00@ 9.50
Canadian Apatite, lump, f. o. b. at shipping port, per unit 24
Phosphorus—Per lb..... 65
Plumbago—Ceylon, per lb... . 4@5
American, per lb..... 5@7
London, per cwt £0 15 0
Potassium—Cyanide, per lb ...39@41
Bromide, per lb..... 37
Chlorate, per lb ....15¼@15½
Carb. per lb 5
Caustic, per lb 7½
Iodide ....2.70@2.75
Muriate, per 100 lbs..... 1.77½@1.80
Nitrate, refined, per lb..... .. 6
Bichromate, per lb.... ..... 10½
Sulphate, per 100 lbs..... .... 1.10
Yellow Prussiate, per lb..... 19
Red Prussiate, per lb..... 42
Pumice Stone—Select lumps, lb. 3@5
Original cks., per lb..... . .... 1¾
Powdered, pure, per lb..... 2
Pyrites—Non-cupreous, p. unit, s. 14
Quartz—Ground, per ton 18.00
Rotten Stone—Powdered, per lb. 8½
Lump, per lb..... 5
Eng., powdered, per ton £4
Lump, per ton..... £5
Salt—Liverpool, ground per bbl. 70
Turk's Island, per bbl 25
Salt Cake—Per 100 lbs..... 50
Saltpeter—Crude, per lb..... .. 4½
Refined, per lb..... 6
Soda Ash—Carb.,48 ₱ 100 ₱...1.30 @1.35
Caustic, 48 ₱..... .. ..1.30 @1.35
High test ..... 1.12½@1.15
Soda Caustic, 60%..... 2.40@2.50
" " 70%..... 2.25
" " 74–5%..... 2.20
Sal. English, per 100 lbs..... ..1.15
Sal. American, per 100 lbs..... 1.15
Nitrate, per 100 lbs..... 2.05
Strontium—Nitrate per lb..... 10½
Sulphur—Roll, per lb..... .... 1¾
Flour, per lb 2
Crude Brimstone, 2s., ₱ ton ... 27@28
Crude Brimstone, thrds, per ton 24@25
Talc—Ground French, per lb.. ... 1¼
Domestic, per lb..... 6
Domestic, per ton 15.00
c. i. f. Liverpool, per ton..... £4 5 0
Tannin—Pure, per lb. .. ..
Vermillion—American, per lb... 50
English, per lb. 65
Vitriol—(Blue), Ordinary, per lb.. 5½
Extra, per lb 6
Zinc Oxide—Am., Dry, per lb.... 4½
Antwerp, Red Seal, per lb..... 6@6½
Paris, Red Seal, per lb ....6½@7
* Spot.

BUILDING MATERIAL.

Bricks—Pale, per 1,000 ..... 5.00
Jerseys, per 1,000 ..... 7.50
Haverstraw, per 1,000 ..... 8.50
Front bricks, per 1,000, from 10.00
Building Stone—Amherst free-stone, per cu. ft., from.... 75
Brownstone, per cu. ft., from..... 1.00
Granite, rough, per cu. ft., from.. 45
Slate—Purple and green roofing, per 100 ft 6.00
Red roofing, per 100 sq. ft.... ....15.00
Black, roofing, per 100 sq. ft. ... 5.00

THE RARER METALS.

Aluminum—(Metallic), per lb...11.00
Arsenic—Metallic, per lb..... 32
Barium—(Metallic), per lb..... .975.00
Bismuth—(Metallic), per lb..... 2.40
Cadmium—(Metallic), per lb.... 1.45
Calcium—(Metallic), per oz.....150.00
Cesium—(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.... .... 4.50
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.... 16·60@16·70c.
Electrolytic, ₱ lb ..... 16·25c.
Casting Brands, ₱ lb. ... 15·25@15·50c.
Chili Bars, London, ₱ ton..... .....£82 15s.
Sheet Copper (according to size), ₱ lb..... .....25 @38c.
Lead—
Domestic, Common, Spot.. 3·75@3·80c.
Foreign .... 4·60@4·70c.
Sheet, ₱ lb .... 6½@6·60c. net
Pipe, ₱ lb ..... 6c. "
Tin lined Pipe, ₱ lb..... 12c. "
Shot, ₱ lb..... 6 @ 7c.
Tin—
Tin Plates..... .. .. 14s. 6d.
Tin Spot..... .... £80 5s.
Banca pigs, ₱ lb..... .. .... 18·25c.
Zinc—
Domestic spelter, ₱ lb.... ..4·60@4·70c.
Foreign spelter, ₱ lb ... . 5·30@5·40c.
Silesian, ton..... £17
Sheet, American, ₱ lb .... 6¼@6½c
Antimony—Hallet's, per lb...10@10½c.
Cookson's, per lb..... .... 12½
Star Antimony £41
Quicksilver—Per lb..... .....61@63c.
London, ₱ flask..... .....£7@£7¼

IRON AND STEEL.

American Pig-Iron.
No. 1 X .. .$18 00@$18.50 at tidewater
No. 2 X..... $17.00@ 17 50 " "
Forge .. .. $16.00@.. .... " "
Scotch Pig—Coltness... $20.25@ .....
Clyde ....
Dalmellington..... 18 50@ 18.75
Summerlee..... 20 00@ 20.25
Shotts..... 20.25@ ....
By Cable to-day to the Metal Exchange:
Scotch Warrants..... .....37s. 8d.
Coltness, at Glasgow ....46s. 9d.
Langloan, at Glasgow ....44s. 3d.
Summerlee, at Glasgow..... .....46s. 6d.
Gartsherrie, at Glasgow..... .....44s.
Glengarnock, at Ardrossan..... .....43s. 6d.
Dalmellington, at Ardrossan.....39s. 6d.
Eglinton, at Ardrossan ....38s.
Bessemer Pig—
Foreign, nominally..... ..... $19.00
Domestic ....18@18.50 at furnace
Spiegeleisen—
German, 20 per cent..... $26.50
English, 20 " " ..... $26.50@ 27.00
" 30 " " ..... 31.00@ 31.50
Ferro Manganese..... 50.00@ 51.00
Steel Blooms, nominally. ... @ .....
Steel Billets, " 29.50@ .....
Steel Nail Slabs, " 30.00@ .....
Steel Wire Rods, " 40.50@ 41.00
Steel Rails—
Heavy sections, at mill....$30.50@ 31.50
Light " " .... 31.50@ 36.50
Structural Iron and Steel—
Bridge Plate, at mill.. .....1·9 @2c.
Angles, at mill ....2·00@2·05c.
Tees, at mill..... .. ..2·40@2·50c.
Steel Angles, at mill..... ....2·1 @2·2c.
Beams and Channels, on wharf, 3·35c. base
Steel Plates—
Tank and Ship, on wharf..... 2·3 @2·4
Boiler Shell, on wharf.... .... 2·75 @2·8
" Flange, " .... 3 @3
" Fire-Box, on wharf..... 3¼ @4
Iron Plates—
Common tank, on wharf....2 @2·1c.
Refined tank, on wharf.....2·1@2·3c.
Boiler shell, " .... 2·4@2·5c.
Boiler flange, " .....3¼@3½
Extra flange, " .....3¾@4
Bar Iron—
Refined..... .... 1·8@1·9c. "
Common..... .. .. 1·6@1·7c. "
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..... . $26 00@$32.00
Wrought Iron Pipe—nominally—
Butt-Welded, Plain and Tarred, 57½ per cent disc.; Galv., 47½ per cent disc.
Lap-Welded, Plain and Tarred, 67½ per cent disc.; Galv., 52½ per cent disc.
Boiler Tubes—Per cent disc..... 65%
Rail Fastenings—
Spikes..... .....2 @2·1c. delv'd
Angle Fish-bars..... .1·8 @1·9c.
Bolts and Sq. Nuts.....2·7 @2·8c
" " Hex. " .....3 @
Wrought Scrap—
Foreign, *ex store*.....$19 00@
No. 1 Yard *to vessel*..... 19.00@
Cast Scrap ..... 15.50@ 16.50
Old Car Wheels..... .... @ 19.50
Old Rails—Tees ..... 20.00@ 20.50
—Doubles ..... 21.00@
Nails—In car-load lots.. .. 1·90@1·95c.
—From store..... .... 2·00@2·05c.

Louisville Prices.

Hot Blast Irons—
So. Coke, No. 1..... ....$16.50@$17.50
" " No. 2..... 15.50@ 16.50
" " No. 2½..... 15.00@ 15.50
Mahoning Valley (Lake Ore Mixture) .... 18.50@ 19.50
So. Charcoal, No. 1 ..... 18.50@ 19.00
" " No. 2 ..... 16.50@ 17.50
Missouri Charcoal No. 1 .... 19.50@ 20.50
" " No. 2.... 19.00@ 19.50
Forge Irons—
Neutral Coke.... ..... $14.00@$14.50
Cold Short ..... 13.75@ 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..... ...$17.00@ ....
Foundry No. 2..... .... 16.00@ ...
Gray Forge No. 3..... .... 14.25@14.50
" " No. 4..... .. .. 14.25@ ....
White .... 14.25@ ...
Mottled..... 14.25@14.50
Silvery ..... 16.50@18.00
Bessemer..... 16.50@16 75
Charcoal Pig—
Foundry No. 1. .... 23.00@24.50
Foundry No. 2..... . 22.00@24.00
Cold-Blast..... 25.00@26.00
Warm-Blast..... 24.00@25.00
20 p. c. Spiegel..... 27.50@28.00
Muck-Bar..... .... 26.25@26.50
Steel Blooms..... .... 28.00@28.50
Steel Slabs ..... 27.75@28.00
Steel Crop Ends..... .... 18.00@
Steel Bloom Ends.. .... @17 50
Steel Billets..... .... 28.00@28.50
Old Iron Rails..... . 21.50@21.75
Old Steel Rails..... .... 20.00@ ...
No. 1 W. Scrap..... .... 19.00@19.50
No. 2 W. Scrap.. .... 17.00@18.00
Steel Rails..... .... *31.50@32.00
" light sections... .....*33.00@34.00
Bar Iron, nominal..... 1.75@ 1.85
Nails ....$1.90 usual discount
Steel Nails..... ....$1.90
Two per cent off for cash.
* At works.

Philadelphia Prices.

Foundry No. 1..... ... $18.00@19.50
Foundry No. 2..... 17.00@18 50
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@ 2·00
Skelp Iron..... 1.80@ 1.90
Angles..... .... 2.00@ 2.10
Beams and Channels..... .. 3.30@...
Nails .... 1.90@ 2.00
Steel Rails..... .... 31.50@33.50
Old Rails..... 21.00@22.00
Best refined..... .....2@2·1c. base

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid.	Asked.
Atlantic Coal....	$1.40	$1.45@$1.75
Balt. & N. C.....	.25@ .35	.25@ .40
Big Vein Coal.. ...		
Conrad Hill . . .	.08	.15
Diamond Tunnel	.50	60
George's Crk. C.	100@101	105@ 110
Lake Chrome .	.05	
N. State, Balto..	.20@ .28	.30
Ore Knob	.05	.10
Silver Valley . . .	.90	.90@1.25

Highest and lowest prices bid and asked during the week ending June 14th.

Birmingham, Ala.

COMPANY.	Bid.	Asked.
Ala. Coon. C..	....	45
Bir. Min. & Mfg.	...	190 @192½
Bir. Fur. & Mg.	...	22½@ 25
Broken Arrow C. & M.....	7½	15
Corona C. & C.	15	....
Decat. L. Imp. & Fur.....	14½@17	16 @ 18½
DecaturMin. L.	....	27½
Enterprise Mfg Co	35	50
Jagger-Townley C & C. Co.	....	11 @11½
Mag-Ellen C. & Mg	35@40	....
No Bus. Crk., C. & Mg.....	5	12½
Pioneer M. & Mfg	.. ..	....
Sloss I. & S. ..	...	...
*Sloss I. & S..	75	82
Sheffield C & I.	...	70 @ 74
Tenn. C. & I. Co.	25½	27½
*Williamson Iron Co....	....	102
WoodstockS&I	55	58 @ 58½

* Bonds.

Highest and lowest prices bid and asked during the week ending June 11th.

Pittsburg, Pa.

COMPANY.	H.	L.	Closing.
Allegegheny Gas .	35.00	35.00	35 00
Bridgewater Gas..	85.00	81.00	83.00
Charlotte Mg. Co..	....	....	....
Chartiers Val. Gas.	80.00	73.00	75 00
Columbia Oil Co..	3.63	3.00	3.63
Consignee Mg. Co.	.....	.....	... .
Forest Oil Co....	.....	.....	... ..
Iron City Mining..	.....	.....	.....
Kittanning Gas...	.....	.....	.....
La Noria Mining ..	2.38	2.00	2.13
Lustre Mining ...	.50	.50	.50
M'f'turers' Gas....	30.13	29.50	30.00
Nat. Gas Co. of W. Va.....	65.00	62.00	62.00
N. Y. & C. Gas Coal	.....	.....	.....
N. Y. & Westmoreland G., C. & C..	.....	.....	.....
Ohio Valley Gas ..	.....	.....	.....
Pennsylvania Gas.	.....	.....	.....
People's Nat. Gas.	.....	.....	.....
Philadelphia Gas..	45.50	44 50	44.88
Pine Run Gas	84.00	84.00	84.00
Pittsburg Gas....	65.00	60.00	65.00
Silverton Mining..	2.50	2 00	2.00
South Side Gas...	....	.....	.....
Tuna Oil Co.....	63 00	63.00	63 00
Washington Oil ..	45.00	45.00	45.00
W't'h'se Air-Brake	.....	.....	.....
West house Brake	.....	.....	... ..
Westmoreland & Cambria Gas..	.....	.....	.....
Wheeling Nat. Gas.	25 50	23.00	25 13
Yankee Girl Min..	7.00	7.00	7.00

Highest and lowest prices bid and asked during the week ending June 14th.

Foreign Quotations.

	London.	June 2.
COMPANY.	Highest.	Lowest.
Alturas Gold, Idaho...	15s.	14s.
Arizona Copper, Ariz..	18s.	17s. 6d.
Birdseye Creek, Cal. ..	9s.	7s.
Carlisle, N. Mex	24s.	23s.
Centennial Cal	7s. 6d.	5s.
Colorado United, Colo..	5s.	4s.
Columbian, S A.....	30s.	28s.
Denver Gold, Colo....	2s. 6d.	1s. 6d.
Dickens Custer, Idaho.	8s.	7s.
Eberhardt, Nev	2s	1s.
El Callao, Venezuela....	£3¾	£3½
Empire, Mont	£1⅛	£1
Flagstaff, Utah.....	4s. 6d.	3s. 6d.
Garfield, Nev	20s.	19s.
Gold Hill, N. C.....	2s.	1s.
Idaho.....	15s. 6d.	14s. 6d.
Ilex, Cal	18s. 9d.	13s. 3d.
Josephine, Cal.....	£1⅛	£⅞
Kohinoor, Colo.....	2s.	2s.
Lady Franklin N. Mex .	6s.	5s.
Mason & Barry, Portugal	£10¼	£10
Montana Lt., Mont	£1⅜	£1¼
New California, Colo...	5s. 6d.	4s 6d.
New Emma, S., Utah...	5s. 6d.	4s. 6d.
New Hoover Hill, N. C.	2s.	1s. 6d.
New La Plata, Colo...	1s. 9d.	1s. 3d.
Pittsburg Cons., Nev...	37s. 6d.	35s.
Plumas Eureka, Cal....	£15-16	£13-16
Quebrada, Venezuela...	£4⅞	£4⅜
Richmond Con., Nev...	£4¼	£4
Ruby&Dunderberg, Nev	3s.	2s.
Russell Gold, N. C.....	4s.	3s.
Sierra Buttes, Cal....	£⅝	£½
Stanly, N. C.....	15s.	12s. 6d.
Tolima, Colombia, S.A.	£3	£2
Union Gold, Colo.....	4s.	3s. 6d.
U. S. Placer, Colo.....	£¾	£⅝
Viola Lt., Idaho	23s.	21s.
	*Paris.**	May 31.
Boleo	650	650
El Callao.....	89.25	89 25
Golden River	440	440
Lexington.	70	70
" parts	4.25	4.25
Rio Tinto	472.50	472 50
" obligations...	501.25	501.25
" " 2d.	498.75	498.75
Tharsis	123.75	123.75

* France.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and amount of last.			Dividends. Total paid.	Date and amount of last.		
1	Adams, s. l.	Colo.	$1,500,000	150,000	$10					$555,000	Jan.	1887	15
2	Alice, s. c.	Mont	10,000,000	400,000	25	*				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	420,000	Feb.	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	2,666,000	Mar.	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	Big B'nd Hydraulic, g	Dak.	1,000,000	200,000	5	*				258,000	Aug.	1887	.03
13	Black Bear, g.	Cal.	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1883	.20
14	Bodie Con., g. s.	Cal.	10,000,000	100,000	100	450,000	Feb.	1888	.50	1,295,000	Apl.	1885	.50
15	Bonanza Developm't	C &M	3,000,000	300,000	10					135,000	Oct.	1882	.15
16	Bonanza K'g, Cons. s.	Cal.	1,000,000	100,000	10	*				185,000	Feb.	1885	.10
17	Boston & Mont, g.	Mont	2,500,000	250,000	10	*				520,000	Jun.	1886	.15
18	Breece, s.	Colo.	5,000,000	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				30,350,000	July	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	1,860,000	Feb.	1888	2.00
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	*				310,000	Jun.	1888	.05
31	Confidence, s. l	Nev.		24,960		287,440	Apl.	1887	.50	99,840	Jun.	1888	2.00
32	Cons. Cal. & Va., g. s.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	1,900,800	Jun.	1888	.50
33	Con. Gold Mining, g.	Ga.	500,000	100,000	5	*				108,000	Nov.	1888	02
34	Contention, s	Ariz.	12,500,000	250,000	50					‡2,587,000	Dec.	1884	.25
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					600,000	May	1888	.50
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	90,0 0	Dec.	1881	.10	180,000	May	1887	.10
40	Dunkin, s. l.	Colo.	5,000,000	200,000	25	*				330,000	Apl.	1888	.15
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	170,900	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					60,000	Mar.	1887	.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	5,251,000	Mar.	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					4,400,000	Apl.	1888	.50
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	1,710,000	Jun.	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					1,152,500	May	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	4,118,750	May	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	Idaho, g.	Cal.	310,000	3,100	100					4,846,750	May	1888	15.00
70	Ideal, s. l.	Colo.	1,500,000	50,000	10					15,000	Oct.	1886	.05
71	Illinois, s.	N. M.	100,000	100,000	1	*				25,000	Jan.	1887	.25
72	Independence, s.	Nev.	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
73	Indian Queen, s.	Nev.	250,000	125,000	2					368,750	July	1883	.03
74	Iron Hill, s.	Dak.	2,500,000	250,000	10	101,250	Mar.	1888	.07½	156,250	Nov.	1887	.07½
75	Iron-Silver, s. l	Colo.	10,000,000	500,000	20					2,200,000	Feb.	1888	.20
76	Jackson, g. s.	Nev	5,000,000	50,000	100	10,000	Nov	1880	.20	45,000	Oct.	1886	.10
77	Jay Gould	Mont	2,000,000	400,000	5	*				207,000	Apl.	1888	.09
78	Jocuistita, s.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
79	Jumbo, g.	Colo.	2,000,000	200,000	10					35,000	Oct.	1887	.02½
80	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov	1881	.30	1,350,000	Dec.	1886	.10
81	La Plata, s. l.	Colo.	2,000,000	200,000	10	*				610,000	Sept	1882	.30
82	Leadville Cons., s. l. i.	Colo.	4,000,000	400,000	10	*				423,000	Apl.	1887	.05
83	Lexington, g. s.	Mont	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
84	Little Chief, s. l	Colo.	10,000,000	200,000	50	*				800,000	July	1888	.10
85	Little Pittsburg, s. l	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	50
86	Manhattan, s.	Nev	5,000,000	50,000	100	250,000	Dec.	1887	1.00	437,500	Feb	1886	.25
87	Marion Bullion, g	N.C.	500,000							15,000	Jan.	1886	
88	Martin White, s.	Nev.	10,000,000	100,000	100	1,150,000	Mar.	1886	25	140,000	Dec.	1886	.25
89	Mary Murphy, g. s.	Colo.	350,000	3,500	100	*				122,500	Feb.	1888	5.00
90	Minnesota, c.	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1.00	1,820,000	Mar.	1876	
91	Mono, g.	Cal.	5,000,000	50,000	100	616,000	Sept	1887	.50	12,500	Mar.	1886	.25
92	Montana, Lt., g. s.	Mont	3,300,000	660,000	5	*				2,010,968	Apl.	1888	.25
93	Morning Star, s. l.	Colo.	1,000,000	100,000	10					775,000	Mar.	1888	.25
94	Moulton, s. g.	Mont	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
95	Mount Pleasant, g.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
96	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	90,000	May	1888	.20
97	Napa, q	Cal.	700,000	100,000	7					290,000	Jan.	1883	.10
98	Navajo, g. s.	Nev.	10,000,000	100,000	100	485,000	Apl.	1888	.30	§325,000	Feb.	1885	.25
99	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06¼
100	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.50	2,400,000	Apl.	1883	50
101	North Belle Isle, s.	Nev.	10,000,000	100,000	100	250,000	Mar.	1887	.50	230,000	May	1888	.50
102	Ontario, s. l.	Utah	15,000,000	150,000	100					9,200,000	May	1888	.50
103	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,059,440	Aug	1887	.50	1,595,800	July	1882	1.00
104	Original, s. c.	Mont	1,500,000	60,000	25	*				117,000	Dec.	1887	.05
105	Osceola, c.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,122,500	Jun.	1888	1.00
106	Oxford, g.	N. S.	125,000	125,000	1	*				33,500	Oct.	1885	.02
107	Paradise Valley, g. s	Nev.	10,000,000	100,000	100	62,000	Apl.	1888	.15	150,000	Apl.	1887	.10
108	Parrott, c.	Mont	1,800,000	180,000	10					156,000	Jan.	1888	.10
109	Peacock, s. g. c.	N.M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
110	Pleasant Valley, g. s.	Cal.	10,000,000	100,000	100	10,000	Mar.	1884	.10	30,000	Dec.	1882	.05
111	Plutus, g. s. c. l.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
112	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
113	Prussian, s. l.	Colo.	1,500,000	150,000	10					132,000	Jan.	1883	.10
114	Quicksilver, pref., q.	Cal.	4,300,000	43,000	100					1,417,692	July	1888	1.50
115	" com., q.	Cal.	5,700,000	57,000	100					151,000	July	1882	.40
116	Quincy, c.	Mich	1,000,000	40,000	25	200,000	Dec.	1862		4,770,000	Feb.	1888	4.00
117	Richmond, s. l.	Nev.	1,350,000	54,000	25	*				4,312,587	Jun.	1887	1.25
118	Ridge, c.	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	99,785	Feb.	1880	.50
119	Rising Sun, s.	Dak.	750,000	150,000	5	*				52,000	May	1881	.07½
120	Robinson Con., s. l.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
121	Robert E. Lee, s. l.	Colo	10,000,000	500,000	20					100,000	Dec.	1882	.50
122	Rooks, g.	Vt.	500,000	50,000	10	*				61,000	Apr	1885	.30
123	Savage, s.	Nev.	11,200,000	112,000	100	6,324,000	Sept	1887	50	4,460,000	July	1869	3.00
124	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				50,000	July	1884	
125	Shoshone, g.	Idah.	150,000	150,000	1					7,500	Apl.	1883	.01
126	Sierra Buttes, g.	Cal.	2,225,000	122,500	10					1,492,557	Apl.	1888	.12½
127	Sierra Grande, s.	N. M.	2,500,000	500,000	5					860,000	Sept	1884	.25
128	Sierra Nevada, g. s.	Nev.	10,000,000	100,000	100	6,100,000	Apl.	1888	.25	102,000	Jan.	1871	1.00
129	Silver Cord, g. s. l.	Colo.	5,000,000	500,000	10					225,000	Nov.	1883	.25
130	Silver King, s.	Ariz.	10,000,000	100,000	100					1,950,000	July	1887	.25
131	Silverton, g. s. l.	Colo.	2,000,000	200,000	10	*				80,000	Nov.	1886	.02
132	Small Hopes Cons., s.	Colo.	5,000,000	250,000	20	*				3,112,500	Dec.	1887	.20
133	Smuggler, s. l.	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25
134	Socorro, c.	N. M.	250,000	2,500	100					4,000	Mch	1882	.00¾
135	Spring Valley, g.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan	1881	25
136	Standard, g. s.	Cal.	10,000,000	100,000	100	25,000	Oct.	1884	.25	8,595,000	Jun.	1888	.05
137	Stormont, s	Utah	500,000	500,000	1	*				155,000	Nov	1881	.05
138	St. Joseph, l	Mo.	1,500,000	150,000	10	*				844,000	Dec	1887	.20
139	Surinam, g.	D. G.	3,000,000	600,000	5					105,000	Nov	1887	.05
140	Swansea, c.	Colo.	600,000	60,000	10	*				9,000	Apl.	1888	.02½
141	Syndicate, g.	Cal.	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
142	Tamarack, c.	Mich.	1,000,000	40,000	25	520,000	Apl.	1885	3.00	240,000	July	1888	3.00
143	Tip Top, s	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20
144	Tombstone, g. s. l.	Ariz.	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
145	United Verde, c.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
146	Valencia, m.	N. H.	150,000	1,500	100					37,500	Apl	1886	2.50
147	Viola Lt., s. l.	Idah.	750,000	150,000	5					222,500	Dec.	1887	.12
148	Vizina, s.	Ariz.	5,000,000	200,000	25					140,000	Apl.	1882	.10
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	$577,000	Feb	1884	
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.	1883	.10
12	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	Apl.	1886	.10
13	Best & Belcher, g. s.	Nev.	10,080,000	100,800	100	2,029,390	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	Boston & Mont., c. s	Mon.	2,500,000	100,000	25	*			
19	Bremen, s.	N. M.	5,000,000	500,000	10	*			
20	Brunswick, g.	Cal.	2,000,000	400,000	5	*			
21	Bullion, g. s.	Nev.	10,000,000	100,000	100	3,957,000	Aug.	1887	.50
22	Bye and Bye	Ariz.	1,000,000	100,000	10	*			
23	Calaveras, g.	Cal.	500,000	500,000	1	*			
24	Carisa, g.	Wy.	500,000	100,000	5	*			
25	Carupano, g. s. l. c.	Ven.	200,000	100,000	2	*			
26	Cashier, g. s.	Colo.	500,000	250,000	2	*			
27	Cen. Contin'l, g. s. l.	C.&A	2,000,000	200,000	10	*			
28	Charles Dickens, g. s.	Idah.	1,250,000	250,000	5	*			
29	Cherokee, g.	Cal.	1,500,000	150,000	10				
30	Chollar, s.	Nev.	11,200,000	112,000	100	1,208,000	Dec.	1887	.50
31	Cinnamon Mt., g. s.	Colo.	750,000	150,000	5				
32	Cleveland, t.	Dak.	1,000,000	500,000	2	*			
33	Comstock, g. s.	Nev.	10,000,000	100,000	100	30,000	Mar.	1887	.15
34	Con. Imperial, g. s.	Nev.	5,000,000	50,000	100	1,175,000	Sept	1887	.2
35	Con. Pacific, g.	Cal.	6,000,000	60,000	100	177,000	Sept	1887	.10
36	Cons. Silver, s.	Mo.	2,500,000	250,000	10				
37	**Cop. Queen Cons, c.	Ariz.	1,400,000	140,000	10				
38	Courtlandt	Colo.	500,000	50,000	10				
39	Crescent, s. l.	Colo.	3,000,000	300,000	10	*			
40	Crocker, s.	Ariz.	10,000,000	100,000	100	105,000	Feb.	1888	.20
41	Crowell, g.	N. C.	500,000	500,000	1				
42	Dahlonega, g.	Ga.	250,000	250,000	1	*			
43	Dandy, s.	Colo.	5,000,000	500,000	10				
44	Dardanelles, g.	Cal.	1,000,000	100,000	10				
45	Decatur, s.	Colo.	1,500,000	300,000	5	*			
46	Denver City, s. l	Colo.	5,000,000	500,000	10	*			
47	Denver Gold, g.	Colo.	300,000	60,000	5				
48	Durango, g.	Colo.	500,000	500,000	1	*			
49	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
50	El Cristo, g. s.	U.S.C	1,000,000	500,000	2	*			
51	El Dorado, g.	Cal.	1,000,000	250,000	4				
52	El Talento, g.	U.S.C	1,000,000	500,000	2				
53	Empire, s.	Utah	10,000,000	100,000	100	*			
54	Eureka Tunnel, s. l.	Nev.	10,000,000	100,000	100				
55	Exchequer	Nev.	10,000,000	100,000	100	770,000	Feb.	1888	.20
56	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	12,000	Jan.	1888	.06
57	Gogebic I. Syn., i	Wis.	5,600,000	200,000	25				
58	Gold Cup, s.	Colo.	500,000	500,000	1	*			
59	Golden Era, s.	Mon.	2,000,000	200,000	10	*			
60	Gold Placer, g.	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
61	Gold Rock, g.	Cal.	1,000,000	500,000	2	*			
62	Goodshaw, g.	Cal.	10,000,000	100,000	100	*			
63	Grand Belt, c.	Tex.	12,000,000	120,000	100				
64	Grand Duke	Colo.	800,000	80,000	10				
65	Great Remance, g.	U.S.C	1,000,000	500,000	2	*			
66	Gregory-Bobtail, g.	Colo.	550,000	550,000	1	*			
67	Gregory Con., g.	Mon.	3,000,000	300,000	10				
68	Harlem M.& M.Co, g.	Cal.	1,000,000	200,000	5				
69	Head Cent. & Tr. s. g	Ariz.	10,000,000	100,000	100				
70	Hector, g.	Cal.	1,500,000	300,000	5				
71	Highland, c	Mich	500,000	25,000	25				
72	Hollywood	Cal.	200,000	100,000	2				
73	Hortense, s.	Colo.	2,000,000	200,000	10				
74	Huron, c	Mich	1,000,000	40,000	25	280,000	May	1887	3 00
75	Iron Gold & Silver, s	N. M.	2,000,000	200,000	10	*			
76	Ironton, i.	Wis.	1,000,000	40,000	25				
77	Iroquois, c	Mich	1,250,000	50,000	25				
78	J. D. Reymert	Ariz.	10,000,000	100,000	100	*			
79	Julia Cons., g. s.	Nev.	11,000,000	110,000	100	1,650,000	Apl.	1887	.10
80	Kearsarge, c.	Mich	1,250,000	50,000	25	190,000	Oct.	1887	1.00
81	Laclede	N. M.	2,000,000	200,000	10	*			
82	Lacrosse, g.	Colo.	1,000,000	100,000	10	*			
83	Lee Basin, s. l.	Colo.	5,000,000	500,000	10	*			
84	Lochiel, s.	N. M.	2,000,000	200,000	10	*			
85	Lucerne, s.	Colo.	5,000,000	500,000	10	*			
86	Mammoth Bar., g.	Cal.	10,000,000	100,000	100	50,000	Dec.	1881	
87	May Belle, g.	Cal.	10,000,000	100,000	100	84,000	Mar.	1884	.15
88	Mayflower Gravel	Cal.	1,000,000	100,000	10	325,000	Apl.	1888	.25
89	Medora, g.	Dak.	250,000	250,000	1				
90	Mexican, g. s	Nev.	10,000,000	100,000	100	2,700,760	Jan.	1888	.25
91	Middle Bar g.	Cal.	400,000	200,000	2	*			
92	Mike & Starr, s. l.	Colo.	1,000,000	200,000	5	*			
93	Monitor, g.	Colo.	100,000	100,000	1	*			
94	Moose Silver, s.	Colo.	3,000,000	300,000	10				
95	Native, c.	Mich	1,000,000	40,000	25				
96	Neath, g.	Colo.	1,000,000	100,000	10				
97	Nevada Queen, s.	Nev.	10,000,000	100,000	100	130,000	Dec.	1887	.50
98	New Germany, g	N. S.	100,000	100,000	1	*			
99	New Pittsburg, s. l.	Colo.	2,000,000	200,000	10	*			
100	North Standard, g.	Cal.	10,000,000	100,000	100	20,000	Nov		
101	Noonday	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
102	Oneida Chief, g.	Cal.	500,000	125,000	4	*			
103	Oriental & Miller, s.	Nev.	10,000,000	400,000	10				
104	Osceola, g.	Nev.	5,000,000	50,000	25	*			
105	Overman, g. s.	Nev.	11,520,000	115,200	100	3,737,180	Aug.	1887	.25
106	Park, s.	Utah	2,000,000	200,000	100				
107	Peer, s.	Ariz.	10,000,000	100,000	10	125,000	Nov.	1886	.10
108	Peerless, s.	Ariz.	10,000,000	100,000	100	345,000	Apl.	1888	.25
109	Phœnix	Ariz.	500,000	500,000	100				
110	Phœnix, g. s.	Ark.	5,000,000	200,000	1	*			
111	Phœnix Lead, s. l.	Colo.	100,000	100,000	25	*			
112	Pilgrim, g.	Cal.	600,000	300,000	1	*			
113	Potosi, s.	Nev.	11,200,000	112,000	2	1,293,600	Nov.	1887	.50
114	Proustite, s.	Idah	250,000	250,000	100	*			
115	Puritan s. g.	Colo.	1,500,000	150,000	1	*			
116	Quincy	Colo.	3,000,000	300,000	10				
117	Rappahannock, g. s.	Va.	250,000	250,000	10	*			
118	Red Elephant, s.	Colo.	500,000	500,000	1	*			
119	Ropes, g. s.	Mich	2,000,000	80,000	1	103,200	July	1887	.50
120	Russell, g	N. C.	1,500,000	300,000	25				
121	Sampson, g. s. l.	Utah	10,000,000	100,000	5	188,157	Mar.	1887	.25
122	San Sebastian, g.	San.S	1,600,000	320,000	5	*			
123	Santiago, g.	U.S.C	400,000	1,200,000	2	*			
124	Security, s.	Colo.	10,000,000	1,000,000	10				
125	Sheridan	N. M.	2,000,000	200,000	10				
126	Silver Queen, c.	Ariz.	5,000,000	200,000	25	*			
127	South Bulwer, g	Cal.	10,000,000	100,000	100	100,000	May	1881	.25
128	South Hite	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
129	South Pacific	Cal.	500,000	100,000	5				
130	Stanislaus, g.	Cal.	2,000,000	200,000	10				
131	State Line, s.	Nev.	250,000	250,000	1				
132	St. Kevin, g. s.	Colo.	100,000	100,000	1	*			
133	St. Louis & Mex., s.	Mex.	5,000,000	500,000	10	*			
134	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10				
135	St.L.& St.Felipe, g s.	Mex.	1,500,000	150,000	10				
136	St. L. & Sonora, g. s.	Mex.	1,500,000	150,000	10				
137	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*			
138	Sunday Lake, i.	Mich	1,250,000	50,000	25				
139	Sullivan, g. s. l.	Me.	500,000	100,000	5	125,000	Dec.	1882	.25
140	Sutro Tunnel	Nev.	20,000,000	2,000,000	10				
141	Taylor-Plumas, g.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.05
142	Tioga Cons., g.	Cal.	10,000,000	100,000	10	10,000	May	1888	10
143	Tornado Cons. g. s.	Nev.	100,000	100,000	1	*			
144	Tortilita, g. s.	Ariz.	1,000,000	100,000	2	*			
145	Tuscarora, s.	Nev.	10,000,000	500,000	100	110,000	Oct.	1881	.15
146	Union Con., g. s.	Nev.	10,000,000	100,000	100	2,185,000	Nov.	1887	.50
147	Utah, s.	Nev.	10,000,000	100,000	100	95,000	May	1888	.25
148	Washington, c.	Mich	1,000,000	40,000	25				
149	West Granite Mt., s.	Mon.	5,000,000	500,000	10	*			
150	Zelaya, g. s.	C. A.	600,000	300,000	2	*			

G. Gold. S. Silver. L. Lead C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. Non-assessable for three years. § The Deadwood previously paid $275,000 n 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, $42,390,000. Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1875, the Copper Queen had paid $1,350,000 in dividends.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 9.		June 11.		June 12.		June 13.		June 14.		June 15.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Alice, Mont.	....	....	....	....	....	....	....	....	....	....	....	....	....
Argenta, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bassick, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Belcher, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Blue Isle, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bodie Cons., Cal.	....	....	....	....	....	....	2 45	....	2 40	....	....	....	500
Breece, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bulwer, Cal.	....	....	....	....	.72	....	....	....	.85	....	....	....	200
Caledonia, Dak.	....	....	....	....	....	....	....	....	....	....	....	....	....
Central, Mich.	....	....	....	....	25.00	....	....	....	....	....	....	....	100
Chollar, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Chrysolite, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Colorado Cent'l, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Cal. & Va., Nev.	....	....	10 00	9.25	....	....	9.88	9.63	10.75	10 50	12 00	11.30	700
Crown Point, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Deadwood, Dak.	....	....	....	....	....	....	....	....	....	....	1.50	....	80
Dunkin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka Cons., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Father de Smet, Dak.	....	....	.43	....	....	....	....	....	....	....	....	....	400
Freeland, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Gould & Curry, Nev.	....	....	....	....	....	....	3.35	....	....	....	....	....	100
Grand Prize, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Green Mountain, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Hale & Norcross, Nev.	....	....	....	....	....	....	....	....	7 75	....	....	....	100
Holyoke, Idaho.	....	....	....	....	....	....	....	....	....	....	....	....	100
Homestake, Dak.	....	....	....	....	....	....	10.50	....	....	....	10.50	....	200
Horn-Silver, Ut.	....	....	.80	....	....	....	....	....	....	....	....	....	100
Iron Hill, Dak.	....	....	....	....	....	....	....	....	....	....	....	....	....
Iron Silver, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Leadville C., Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Chief, Colo.	....	....	....	....	....	....	.37	.28	....	....	.30	....	2,400
Little Pittsburg, Colo.	.16	....	....	....	....	....	....	....	....	....	....	....	100
Martin White, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Mono, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Mouiton, Mont.	....	....	....	....	....	....	....	....	....	....	....	....	....
Mount Diablo, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Navajo, Nev.	....	....	1.90	....	1.85	1.65	1.70	....	1.50	....	....	....	1,300
North Belle Isle, Nev.	....	....	3.00	....	....	....	....	....	....	....	....	....	100
Ontario, Ut.	....	....	....	....	30.50	....	29 75	....	....	....	30.50	....	450
Ophir, Nev.	....	....	6.75	....	....	....	....	....	8.00	....	9.00	8.13	650
Plymouth, Cal.	....	....	....	....	....	....	9.00	....	....	....	....	....	100
Quicksilver Pref., Cal.	....	....	35.50	....	35.25	....	....	....	35.25	....	37.00	36 25	500
" Com., Cal.	....	....	10.00	9 50	....	....	....	....	....	....	....	....	600
Robinson Cons., Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Savage, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nevada, Nev.	....	....	....	....	....	....	3.50	....	4.00	....	....	....	200
Silver King, Ariz.	....	....	4.00	....	....	....	....	....	....	....	....	....	25
Small Hopes, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Standard, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Stormont, Ut.	....	....	....	....	....	....	....	....	....	....	....	....	....
Yellow Jacket, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 9.		June 11.		June 12.		June 13.		June 14.		June 15.		SALES
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alta, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Amador, Cal.	2.35	2.30	2.30	....	2.40	2 35	2.40	2.35	2.50	2 40	2.50	....	4,900
Am'can Flag, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Barcelona, Nev.	.96	.93	1.00	.92	1.10	.94	1.10	1.00	1.15	1.00	1.15	1.05	10,950
Bechtel Con., Cal.	....	....	....	....	....	....	.11	....	....	....	....	....	100
Best & B'icher, Nev.	....	....	....	....	....	....	3.65	....	....	....	4.60	....	140
Brunswick, Cal.	....	....	....	....	....	....	....	....	.15	....	.15	....	200
Bullion, Nev.	1.80	....	1 40	....	1 25	....	....	....	....	....	....	....	550
Carupano, Venes.	....	....	....	....	....	....	....	....	....	....	....	....	....
Cashier, Colo.	....	....	....	....	....	....	....	....	.10	....	....	....	....
Castle Creek, Id.	....	....	....	....	....	....	.09	....	....	....	....	....	500
Central Ariz., Ariz.	....	....	....	....	....	....	....	....	....	....	....	....	500
Cleveland, Dak.	....	....	....	....	....	....	....	....	....	....	....	....	....
Confidence, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Imperial, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Pacific.	....	....	....	....	....	....	....	....	....	....	....	....	....
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Eastern Oregon	.02	....	.02	....	....	....	....	....	....	....	.02	....	3,900
El Cristo, U. S. Col.	1.50	....	1.50	1.30	1.40	....	1.45	1.30	....	....	....	....	1,300
Excelsior, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Exchequer, Nev.	1.20	....	1.25	..	1.15	....	....	....	....	....	....	....	6 3
Found Treas'e, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Hector, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Hollywood, Cal.	.33	.30	.32	....	.33	....	.33	....	.34	.33	.34	.33	6,500
Huron, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Julia, Nev.	.50	....	.55	....	....	....	....	....	.50	....	.55	....	1,600
Kingst'n & Femb'ke	....	....	2 50	....	....	....	....	....	....	....	....	....	100
Kossuth, Nev.	.20	....	....	....	....	....	....	....	.20	....	....	....	1,100
Lacrosse, Colo.	....	....	.10	....	....	....	....	....	....	....	....	....	500
Lee Basin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Mexican, Nev.	....	....	3.50	....	....	....	3.60	....	....	....	4.90	....	500
Middle Bar, Cal.	.42	.41	.41	.40	.41	.39	.41	.40	.50	.40	.42	.40	4,400
Monitor, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Ori'tal Mill'r, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix Lead, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Ark.	....	....	....	....	....	....	....	....	....	....	....	....	....
Potosi, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Proustite, Idaho	1.15	1.10	1.15	....	1.15	....	1.15	....	1.15	....	1.15	1.10	2,600
Rappahann'k, Va.	.13	....	.13	....	....	....	.13	....	.13	....	.13	....	3,900
San Sebastian, S'nS	.89	.87	.88	....	.88	.87	.88	....	.80	....	.88	....	1,900
Santiago, U. S. Col.	....	....	....	....	....	....	....	....	....	....	....	....	....
Scorpion, Nev.	....	....	.75	....	....	....	....	....	....	....	....	....	200
†Security, Colo.	....	....	....	....	.05	....	.08	....	....	....	....	....	700
Shosnone, Idaho.	.12	.11	.12	....	....	....	.12	....	.12	.11	.14	.11	8,100
Silver Cliff, Colo.	....	....	.09	....	....	....	.09	....	....	....	....	....	1,000
Silver Cord, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Mg. of L. V.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Queen, Ariz.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutro Tunnel, Nev.	....	....	.13	....	.14	.13	.15	.14	.17	.15	.21	.16	34,550
Taylor Plumas, Cal.	....	....	....	....	.01	....	....	....	.01	....	.01	....	5,700
Tioga, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Tornado, Nev.	....	....	....	....	....	....	....	....	....	....	.50	....	500
Union Cons., Nev.	....	....	....	....	....	....	....	....	....	....	4.75	....	200

*Assessment unpaid. †Dealt in at the New York Stock Ex. Unlisted Securities Dividend shares sold, 9,025. Non-dividend shares sold, 102,090. Total New York, 111,115.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	June 8.		June 9.		June 11.		June 12.		June 13		June 14.		SALES.
Atlantic, Mich.	....	....	17.50	....	17.00	....	17.00	....	....	....	....	....	300
Bodie, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bonanza Developm't	1.50	....	1.50	....	1.50	1.38	1.50	....	1.50	....	1.50	1 38	1,600
Boston & Mont., Mont.	....	....	....	....	....	....	....	....	....	....	....	....	....
Breece, Colo.	.28	....	....	....	.28	....	....	....	....	....	....	....	400
Calumet & Hecla, Mich.	....	....	*244	242	....	....	....	....	239	....	....	....	92
Catalpa, Colo.	.20	....	....	....	.20	....	....	....	.20	....	....	....	800
Central, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Chrysolite, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Cal. & Va., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo.	.83	*.75	.80	.78	....	....	.80	.75	.80	.77½	.80	.77½	2,700
Enterprise.	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich.	15 13	....	15.25	15.13	15.00	....	15.25	15.00	15.00	14.75	15.00	14.75	1,093
Freeland, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Hale & Norcross, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Honorine, Utah.	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Chief, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Pittsburg, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Napa, Cal.	....	....	1.75	....	1.75	....	....	....	1.75	....	1.75	....	850
Osceola, Mich.	*21.	20.	21.	....	21.	*20¾	*20.	....	*20½	....	20.00	....	146
Pewabic, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Quincy, Mich.	....	....	....	....	71.50	71.00	71.75	71.50	72.00	71.50	72.00	....	321
Ridge, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nev., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver King, Ariz.	....	....	4.25	....	....	....	....	....	....	....	....	....	50
Standard, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Tamarack, Mich.	165	164½	....	....	....	....	....	....	....	....	....	....	15

NAME OF COMPANY.	June 8.		June 9.		June 11		June 12.		June 13.		June 14.		SALES
Alloues, Mich.	1.13	....	1.13	....	....	....	1.13	1.00	1.00	....	1.00	....	1,200
Arnold, Mich.	....	....	....	....	....	....	....	....	.20	....	....	....	400
Aztec, Mich.	....	....	....	....	.07	....	....	....	....	....	....	....	150
Bos. & Mont., Mont.	50.00	49.75	50.00	....	....	....	48.00	....	48.00	....	50.00	48.25	900
Bowman.	....	....	....	....	....	....	....	....	....	....	....	....	....
Brunswick, Cal.	.18	....	.18	....	.18	....	.18	....	....	....	....	....	1,400
Crescent, Colo.	....	....	.09	....	.09	....	....	....	.09	....	.09	....	3,000
Cusi, N. Mex.	....	....	....	....	....	.08	....	....	....	....	....	....	100
El Cristo, U.S. Col.	....	....	....	....	....	....	....	....	....	....	....	....	....
Everett.	....	....	.25	....	....	....	....	....	....	....	....	....	200
Hanover, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Humboldt, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Hungarian, Mich.	.10	....	....	....	....	....	....	....	....	....	....	....	100
Huron, Mich.	4.50	....	4.50	....	4.50	....	4.50	....	4.50	....	4.50	....	550
Kearsarge, Mich.	6.50	....	6.50	....	6.50	6 25	....	....	6.00	....	5.75	....	520
Mesnard, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	100
National, Mich.	....	....	....	....	2.25	2.06	....	....	....	....	2.13	....	250
Oriental & M., Nev.	....	....	....	....	....	....	.10	....	....	....	....	....	400
Rappahannock, Va.	....	....	.13	....	.12	....	....	....	.13	....	.13	....	1,100
Royal, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Security, Colo.	.08	....	.08	....	....	....	.07	....	....	....	.07	....	1,900
Sampson, Utah.	....	....	....	....	....	....	....	....	....	....	....	....	....
South Side, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
St. Marys, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
St. Louis, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutro Tunnel, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Taylor Plumas, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Winthrop, Mich.	....	....	....	....	....	....	....	....	.20	....	....	....	100

*Ex-dividend. Boston: Dividend shares sold, 8,367. Non-dividend shares sold, 12,370. Total Boston, 20,737.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	June 9.		June 11.		June 12.		June 13.		June 14.		June 15.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal.	....	†16	....	†16	....	†16	....	†16	....	†16	....	....	....	....
Buck Mt. Coal.	....	*4	....	*4	....	*1	....	*4	....	*4	....	....	....	....
Ches. & O. RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Chic. & Ind. Coal RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Col. & Hocking Coal.	100	....	....	19	....	....	....	19	....	....	....	....	....	150
Col., C. & I.	100	....	....	33	....	32½	32	....	....	32¾	....	34	....	610
Connellsville Gas Coal.	....	†50½	*50	†50½	*50	†50½	*50	†50⅛	*50	....	....	....	....	....
Consol. Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & H. C.	100	108⅞	108¾	108¾	108⅞	108⅝	108	109	108¼	108¼	....	108½	108¼	4,627
D., L. & W. RR.	50	128⅝	128¼	128½	127½	127⅞	127⅛	128¼	127⅜	128⅜	127⅜	128⅜	127¼	44,276
Hocking Valley.	100	....	....	....	....	19	....	....	....	19	....	....	....	27
Hunt. & Broad Top	....	....	....	....	....	16½	....	17	16½	17⅛	17	....	....	1,449
Do. pref.	....	40¼	39⅞	....	....	....	....	40¼	....	40¾	....	....	....	500
Lehigh C. & N.	50	48¼	....	48⅝	48¼	48¾	48¼	48⅛	....	48⅛	....	....	....	675
Lehigh Valley RR.	50	53¼	53⅛	53½	53¼	53¼	53⅜	52⅜	....	52¼	52⅛	....	....	461
L. & W. C. & I. Co.	....	....	....	....	....	....	....	....	....	15	....	....	....	200
Mahoning Coal RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Marshall Con. Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Maryland Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Montauk Coal.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Morris & Essex.	100	....	....	139¾	....	140	....	....	....	....	....	....	....	250
New Central Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
N. J. C. RR.	50	....	....	82⅛	81½	81¾	80¾	82	81⅛	82	80⅝	81⅞	81	6,450
N. Y. & S. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Y., Susq. & Western	100	....	....	....	....	8¼	....	....	....	....	....	8⅛	....	170
Do. pref.	100	....	....	....	....	28⅝	28½	28¾	....	28⅝	....	....	....	500
N. Y. & Perry C. & I.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Norfolk & Western R.R.	100	....	....	....	....	....	....	17¼	16	....	....	....	....	110
Do. pref.	50	46⅛	45¾	45⅝	45½	45½	44⅝	45¾	45	45¼	45	46¾	45⅞	4,800
Penn. Coal.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. Gas Coal.	....	....	....	....	....	....	....	†50	....	†50	....	....	....	....
Penn. RR.	50	53	52¾	52⅞	52½	52⅝	52½	52⅝	52¼	52½	52¾	....	....	5,574
Ph. & R. RR.**	50	59¾	59¼	59½	57⅝	58	56½	58¼	56¾	57⅞	56⅝	58¼	57¼	439,981
Tennessee C. & I. Co.	100	28	....	27	26½	26¾	25¾	28	27	27½	27¼	....	....	1,875
Westmoreland Coal.	100	....	....	*69½	....	69½	....	....	....	†70	....	....	....	10
Whitebreast Fuel Co.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wyoming Valley Coal	....	†46	*45	†46	*45	....	....	†46	*45	*46	....	....	....	....

*Bid. †Asked.
**Of the sales of this stock, 83,481 were in Philadelphia, and 356,500 in New York. Total sales, 512,695.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS. June 8.	June 9.	June 11.	June 12.	June 13.	June 14.
Alpha	....	....	....	....	....	....
Alta	.90	.90	1.00	1.55	1.60	1.65
Belcher	....	....	....	....	....	....
Belle Isle	.50	....	....	....	....	....
Best & Bel.	3.55	3.55	3.80	3.55	4.15	4.65
Bodie	2.20	2.20	2.35	2.40	2.35	2.40
Bulwer	.70	.70	.75	.80	.90	.85
Chollar	3.50	3.50	4.15	3.70	3.95	4.15
C'm'weal'h	....	....	....	4.25	4.25	4.15
Con. C. & V	9.25	9.25	10.00*	9.62½	10.25	11.00
Con. Pac.	....	....	....	....	....	....
Crown Pt.	4.50	4.50	4.65	4.45	4.95	5.00
Eureka C.	6.00	6.00	....	6.00	....	....
Gould & C.	3.20	3.20	3.75	3.40	3.75	4.00
Grd. Prize.	1.90	1.90	....	1.75	1.75	....
Hale & N.	6.75	6.75	7.50	7.12½	7.37½	7.75
Mexican	3.50	3.50	3.90	3.75	4.25	4.55
Mono	1.20	1.20	....	1.55	1.50	1.45
Mt. Diablo	3.40	3.40	....	....	....	....
Navajo	1.75	1.75	....	1.80	1.65	1.70
Nev. Queen	....	....	....	3.50	3.60	3.90
N. Belle I.	3.00	3.00	3.00	3.10	3.20	3.30
Ophir.	6.62½	6.62½	7.37½	7.00	7.50	8.00
Potosi.	2.85	2.85	3.40	3.25	3.55	3.70
Savage	4.20	4.20	4.50	4.25	4.50	4.55
Scorpion	....	....	....	....	....	....
Sierra Nev	3.25	3.25	3.80	3.45	4.00	4.20
Sutro Tun.	....	....	....	....	....	....
Tip Top.	....	....	....	....	....	....
Union Con.	3.15	3.15	3.45	3.85	4.05	4.45
Utah.	1.35	1.30	1.50	1.50	1.60	1.75
Yellow Jkt.	4.40	4.40	4.85	4.50	4.90	5.25

*Ex-dividend, 50 cents.

inst., the whole list of regular nominations as given in our last issue was elected, with the exception of T. T. Forest and J. A. Macpherson, who were elected in place of Messrs. Dudenhofer and Hard. The annual report for the fiscal year ending May 31st, 1888, shows that the transactions for the year aggregated 1,348,690,000 barrels of oil, or about 330,000,000 barrels less than for the preceding year. Pipe Line stocks have been reduced from 32,358,422 barrels to 25,084,034, and outstanding certificates from 22,428,-036 barrels to 17,013,288 barrels.

The transactions in railroad stocks for the year amounted to 50,602,640 shares. Transactions in miscellaneous security and bonds aggregated $35,429,-000, and in mining stocks, 6,924,373. The membership of the exchange is 2358, of which all but 51 are participants in the gratuity fund. The receipts of the exchange for the year were $166,565.20, and the expenses, $155,064.04. The surplus shows a credit balance of $397,813.86.

The *Daily Indicator* squirms under our allusion to the disgraceful part it took in inflating the *Security* bubble, and seeks to divert attention by misrepresenting what Dr. Raymond said concerning some other mines in which neither the ENGINEERING AND MINING JOURNAL nor either of its editors ever had a dollar of interest.

This trick is far too old to be effective, and however disappointed the *Indicator* may feel over the collapse of its Security and the impossibility of floating any more of the worthless stock, it is senseless as well as useless for it to add slander and falsehood to its other offenses.

We also beg to inform the angry and disappointed *Indicator* that when the ENGINEERING AND MINING JOURNAL exposed the Security fraud more than a year ago, it was not "guessing," but knew the facts, and, as is its wont, stated them fearlessly, when by doing so it could protect the investing public.

Our contemporary's *post mortem* virtue, which denounces "the promoters (who) have wilfully misrepresented things" only when the public won't buy the stock it has exhausted every effort to inflate and float, is indeed a sorry foundation on which to build a criticism of others. Having been caught *flagrante delicto*, it were more becoming for it to grin and bear it in silence "like a man," and determine to get good collateral with the worthless stuff it takes the next time it goes into the bubble floating business; this at least might improve its temper if not its morals.

The stock of the Extension Gold Mining Company, of Amador County, Cal., is being offered in this market at $2 a share, which would be on the basis of $200,000 for the prospect. The company publishes some very brief opinions by experts, the principal of which is by W. A. Irwin, formerly of Bodie, Cal., whose gross misrepresentation of the Bulwer mine, of which he was manager, has not yet been forgotten.

The editor of the Amador *Ledger*, under date 26th May, says: "This property adjoins the Pacific on the southeast. There is a shaft about 40 feet deep, and the development, as far as it has been pushed, gives well-founded hopes that it will prove a good property. It is not claimed by those interested that it is a proven mine; it is but a prospect, which holds forth the promise of developing into a mine. The original owners are all poor men, unable to develop it. Consequently they have sold or bonded it to Eastern parties, who are placing the stock in New York and Boston for the purpose of raising the necessary money to work the property in good shape." This certainly does not justify the $200,000 valuation, and there is no information as to the proportion of the capital in the treasury for working capital nor what the mine cost. Nor have we been able to obtain any definite information on application to the office of the company in this city.'

The Tortilita Gold and Silver Mining Co. has issued the following circular:

"THE MONEY RAISED FOR TORTILITA.

'57 BROADWAY, June 11, 1888.

"MY DEAR SIR: Having arranged for the necessary funds to supply steam hoisting works and increase the capacity of our mill, the sale of stock in the Tortilita Gold and Silver Mining Company will be discontinued until it is earning dividends, after the few remaining shares of the first allotment are disposed of, the price for which is one dollar per share to immediate purchasers—our last offer. The money for this machinery would have been raised long ago, but for the published misrepresentations of the property, based upon false and malicious reports. It has been a long and trying contest of right against wrong, but we have won it, and I am sincerely grateful for the generous support of my friends every where, and for the confidence and aid of the stockholders of the company, whose interests alone have been my concern.

"My best thought and attention will continue to be devoted to the development and successful operation of the Tortilita property, and I shall leave nothing undone within my power to make it one of the greatest bullion producers in the country.

Yours truly, JOSEPH H. REALL.

"P. S.—In reply to inquiries about the stock of the Extension Gold Mining Company, whose shares are being offered to the public, I can recommend it as a safe and most promising investment."

Evidently the public has ceased to buy, and "the few remaining shares" are now offered at one dollar a share, or about one half what the company was asking for them a year ago. As the company has 500,000 shares, this would still make the price of the mine probably ten to twenty times what it is worth, so far as any value has been shown in it.

Mr. F. K. Moreland, the counsel for the company, said to an ENGINEERING AND MINING JOURNAL representative: "We have raised $15,000 for the improvement and enlargement of our mill and machinery and to supply steam hoisting machinery.

"In reference to our suit against James Gordon Bennett for $100,000, we have served the necessary papers. As soon as the trial is begun, we shall engage some of the ablest lawyers in the city to press our case.

"The five-stamp mill at the mine has been shut down, but will probably be opened very shortly." Has the mill been shut down because the mine can not supply even five stamps with ore?

Auction Sale of Stocks.

The following securities were sold at auction in this city on the 13th inst.: $1000 Borden Mining Company 6 per cent bond, due January 1st, 1907, 90; $7000 Union Steel and Iron Company, of Chicago, 1st mortgage 6 per cent bonds, 98¼; $19,900 Clearfield Bituminous Coal Corporation "Series A" 1st mortgage 5 per cent bonds, due 1917, 65.

Meetings.

Copper Queen Consolidated Mining Company, No. 52 William street, New York City, June 26th, at one o'clock P.M. Special meeting for the purpose of receiving a report of the action of the Board of Trustees relative to the building of a railroad between Fairbank and Bisbee, Arizona, and to take such action thereon as may be deemed advisable.

Green Mountain Gold Mining Company, office of De Forest & Weeks, No. 120 Broadway, New York City, June 20th, at twelve o'clock noon. Special meeting for the purpose of considering what steps can be taken for the redemption of the property from sale under execution.

Libertad Mining Company, No. 1145 Broadway, New York City, July 3d, in the evening.

Small Hopes Consolidated Mining Company, No. 1 Broadway, New York City, June 26th, at one o'clock P.M.

Southern Mining and Transportation Company, No. 2024½ Second avenue, Birmingham, Ala., July 2d, at twelve o'clock noon. Special meeting (1) to elect a board of directors; (2) to act upon a proposition to borrow a sum of money, not exceeding $500,000, to issue the bonds of the company therefore, and to secure the payment of the same by a mortgage or trust deed upon the company's property, etc.

Dividends.

Confidence Silver Mining Company, of Nevada, has declared a dividend of two dollars per share, or $49,-920, payable June 11th, in San Francisco.

Calumet & Hecla Mining Company, of Michigan, has declared a dividend of five dollars per share, or $500,000, payable July 6th, in Boston.

Hale & Norcross Mining Company, of Nevada, has declared a dividend, No. 38, of fifty cents per share, or $56,000, payable June 8th, at Room 58, Nevada Block, San Francisco, Cal.

Homestake Mining Company has declared a dividend, No. 119, of twenty cents per share, or $25,000, payable June 25th, at Messrs. Lounsbery & Co., No. 15 Broad Street, New York City.

Lehigh Valley Railroad Company has declared a quarterly dividend of one and one quarter per cent, payable Jnly 16th, at 228 South Third street, Philadelphia, Pa.

Little Chief Mining Company, of Colorado, has declared a dividend, No. 12, of ten cents per share, or $20,000, payable July 7th, at No. 137 Broadway, New York City.

Philadelphia (Natural Gas) Company has declared a dividend, No. 32, of one per cent, or $75,000, payable June 25th at No. 935 Penn avenue, Pittsburg, Pa. Checks will be mailed as usual to stockholders.

Quicksilver Mining Company, of California, has declared a dividend upon preferred stock of one dollar and a half per share, or $64,500, payable July 2d.

Assessments.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am'nt per share.
Alta, Nev.	37	May 12	June 12	July 9	.50
Alta Idalia, Dak.	1	May 24	June 20	July 16	.001
Anchor, Utah.	6	June 1	July 5	July 26	.10
Arnold, Ariz.	4	May 1	June 4	June 26	.75
Best & Belcher, Nev.	40	June 5	July 10	July 31	.25
Big Hole Pl., Utah.	3	May 7	*Jne12	Aug 15	.01
Bulwer Cons., Cal.	4	May 3	June 7	July 5	.20
Challenge Cons., Nev	4	May 29	June 29	July 18	.50
Cora, Dak.	2	June 2	July 6	July 27	.00½
Florence, Dak.	2	May 10	June 17	July 2	.00½
Golden Reward, Dak	2	.....	June 8	June25	.01¼
Homeward B'd, Dak.	5	Mar. 24	May 26	June21	.001
Himalaya, Utah.	3	Apr. 26	May 26	June26	.005
Justice, Nev.	46	May 7	June 11	July 2	.25
Last Chance, Nev.	10	May 7	May 8	June30	.10
New La Plata, Dak.	2	May 7	June 7	June25	.001
Nye, Nev	1	May 28	July 5	July 24	.05
Paradise Valley, Nev.	5	May 29	May 29	June18	.15
Occidental Con., Nev	2	Mar. 3	July 2	July 25	.20
Rochester Utah.	..	May 15	June 16	July 2	.05
Scorpion, Nev	23	May 25	June 22	July 16	.10
Searcy-Calkins Dak	9	June 5	July 10	Aug. 1	.00½
Silver Bar, Dak.	1	May 24	June20	July 16	.001
Seg. Belcher Cons., Nev.	1	June 5	July 9	July 30	.25
Tioga Cons., Cal.	18	May 1	June 5	June27	.10
Utah, Nev.	4	May 4	June 8	June26	.25

* One half cent a share is delinquent if unpaid June 12th, and the other if unpaid July 12th.

Pipe Line Certificates.

The oil market has shared in the prevailing dullness in Wall street during the past week. While volumes are written concerning the probable action of the Producers' Association, and the effect of the increasing sources of supply upon the market, all this philosophy does not restore activity in the oil pit.

A well-known broker says the room traders are much more interested in the Sheepshead races just now than they are in oil speculation. Unless some striking new feature presents itself, we may look for a continuance of this state of affairs.

On Saturday the market opened strong at 79 and reached 79⅝.

On Monday a relapse occurred, and 77⅝ has been the highest point reached since then. In short, the appended tables tell all there is to be said.

The National Transit Company gives notice that all credit balances at the close of business on June 15th, and all certificates and acceptances made prior to that time are liable to assessment, owing to the destruction of fire tank No. 1629, located on Saddle River, Bergen County, N. J.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 9..	79c.	79⅝c.	78¼c.	78¼c.	483,000
11..	77⅛	77⅛	75¼	76¼	1,789,000
12..	76⅝	77⅛	76	77⅛	864,000
13..	77⅛	77⅝	76¼	76½	542,000
14..	76⅝	77⅛	76¼	77⅛	826,000
15..	77⅛	77¾	76⅞	77	210,000

Total sales in barrels..... 4,714,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 9..	79½c.	79⅝c.	78¼c.	78¼c.	149,000
11..	77⅛	77⅝	75¼	76	743,000
12..	76¼	77⅛	76½	77⅛	308,000
13..	77⅛	77⅝	76½	76¾	315,000
14..	76½	77⅛	76¼	77	317,000
15..	77¼	77¾	76⅞	77⅛	483,000

Total sales in barrels..... 2,315,000

Financial Statements.

The following are the financial balances of the various mining companies on June 1st:

	CASH ON HAND.		
Alpha Con.	$17,426.93	Independence.	$4,987 15
Alta.	4,192 90	Julia.	1,830.88
Andes.	17,016 02	Justice.	2,560.47
Belcher.	19,138.62	Mexican.	10,814.88
Belle Isle	9,189.14	Mono.	20,975.55
Bodie	51,070.85	¶North Belle Isle	40,000 00
Bullion.	13,512.52	Navajo.	4,070.57
Bulwer.	382.81	North Peer.	143.85
Caledonia.	1,155.02	Orleans.	410.59
*Con. Cal. & Va.	106,160.23	Ophir.	4,539 94
‡Confidence	154,265.83	Overman.	20,618.88
Crocker.	16,897.00	Peerless	23,357.34
**Crown Point.	24,516.87	Poudere.	13 55
Dudley.	539 16	Sierra Nevada.	23,340 15
Eureka Cons.	8,205.73	Scorpion.	260.00
Exchequer.	13,694.01	¶¶Standard	52,016 46
Found Treasure.	1,974.97	Syndicate.	9,970.89
Gould & Curry.	13,749 91	Tioga.	19.47
†Hale & Norcross	96,675.32	Union	26,740.87
Imperial	6,294.03	Weldon	4,548.80

‡With the closing bullion shipment for May to be added.

*Cash in bank and unsold bullion on hand of the value of $189,338.70, with large shipment to be received before the close of the fiscal month.

**With $2602.25 to be collected on pending assessments.

†With other shipments yet to arrive, which will swell the April product to nearly $150,000.

¶In crude bullion unsold with indebtedness of $1798.52.

¶¶On hand here and in New York, $52,016.46.

	INDEBTEDNESS.		
Best & Belcher.	$909.64	Nevada Queen.	$22,708.84
Challenge Con.	13,347.66	North Common-wealth.	6,373.51
*Chollar	25,988.13	Occidental Con.	3,168.60
Commonwealth.	7,026.97	Peer.	200.32
Del Monte.	5,130 16	Potosi.	5,673.24
Diana.	3,817.65	†Savage.	42,357.71
Grand Prize.	25,927.13	Seg. Belcher	24,318 86
Holmes	2,034.39	‡Utah Con.	436.49
Locomotive	5,987.29		
Mount Cory.	49,120.16		

*Less bullion to be received before the fiscal month closes.

†Less 8,926 ounces of fine silver bullion and other shipments to be received before the fiscal month closes.

‡With an assessment now pending to be collected.

Boston Mining Stocks. June 14.

[From our Special Correspondent.]

The copper stock market has ruled extremely dull the past week, but prices generally have been well sustained, although in a few instances there has been some falling off in consequence of a pressure to sell when there were no buying orders in the market.

Calumet & Hecla sold ex-dividend at $242@$244 on the 9th, but declined to $239 to-day on a lot of five shares only; but there was no stock offered at the close at less than $242. Quincy has been in good demand and advanced to $72, with $71¾ bid and $72 asked.

Franklin declined from $15 to $14⅞, which was bid for it at the close.

Osceola advanced to $21 but declined to $20½ on small transactions.

Boston & Montana declined to $48, at which about 300 shares were sold. To-day fresh orders to buy the stock advanced prices to $50, and it was strong with $50, bid and none offered.

Tamarack sold at $165 but was offered to-day at $161 and no bid.

Kearsarge declined to $5¾, and was offered at $6, with $5½ bid.

Atlantic sold at $17, and was offered at the same price.