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

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Cable address: "Rothwell," New York.

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

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THE great explosion at Flood Rock, which occurred on the 10th inst., was completely successful. About 280,000 pounds of explosive, rend-rock and rackarock, were used, and the results were quite satisfactory to the engineers in charge. The engineering features of the work will be discussed and illustrated in the next issue of the ENGINEERING AND MINING JOURNAL. A desire to make this record as complete and valua ble as possible has induced us to delay its appearance for a week.

UNDER the title "A Deluge of Copper," the London *Times* some time ago contained a strong "bear" article, written apparently from this side of the Atlantic, and with the view of depressing the London market, in-which it apparently was successful; for at the date of its issue, Chili Bars were quoted at £43 10s., and a few days ago were quoted at £39 5s. We have nothing to do with the market further than to record faithfully its fluctuations and give the data on which each may base a reasonable forecast of the future; but the *Times's* article makes many erroneous assumptions, more especially as to the probable future copper output of this country; and it is desirable that these misstatements and erroneous deductions be corrected. It seemed appropriate to make these corrections in the London *Times*, and our correspondent, Mr. JAMES DOUGLAS, Jr. —than whom we have no higher authority on the copper industry in this country—promptly addressed a letter to that paper. For some reason not stated, the publication of that letter has been delayed in the *Times* office, and we now feel justified in publishing what, out of courtesy to our great contemporary, we refrained from publishing some weeks ago. Mr. DOUGLAS'S able letter, which will be found on another page, is full of important and suggestive information, which can be used, with all confidence, by those interested in the copper market.

IN the ENGINEERING AND MINING JOURNAL of August 29th, in referring to the Copper Queen-Atlanta combination, we made reference to the suit of the Copper Prince against the Queen in the following words, which have been taken exception to by some of the parties interested in the Prince: "The Queen still has a suit brought by the Copper Prince for a considerable amount; but the character of that suit is well known, and it is quite unlikely that it will succeed."

The suit here referred to is for ore taken out by the Queen Company from ground claimed by the Prince. The suit is brought for, we believe, $150,000, which is many times the value of the ore claimed to have been taken, and many times what even some of the owners of the Prince expect to get, should the decision of the court favor them. In the recent suit, in which the verdict was for the Prince, the judge before whom the case was appealed, while refusing a new trial to the Queen, stated that, after carefully examining the evidence, it appeared that there was not a single important fact sworn to by the witnesses on either side that was not controverted by equally positive sworn testimony by those on the other side. Apparently, little or no credit was given to the testimony on either side; and certainly the whole case had a very unsavory reputation. It appears, however, that the Prince won the first case, both in the lower court and on appeal, and now has a suit against the Queen for the ore extracted, as above stated.

THE gold yield of Victoria, Australia, is declining, having amounted to only 185,037¾ ounces for the quarter ended June 30th, 1885, as against 192,438½ ounces for the previous quarter, and less than in the corresponding quarter of any year since 1876 at least. The decrease is principally from alluvial mines. From quartz mining, the yield is increasing, and some of the mines are attaining a considerable depth. The Madala Company, Stowell, has a shaft 2409 feet in depth, and Lausell's 180 mine, Sandhurst, 2041 feet. These are the deepest shafts in the colony.

The quantity of quartz crushed during the quarter ended June 30th, 1885, was 211,643·3 gross tons; average yield of gold per ton, 10 dwt. 8·9 grs. Not a single district averaged as high as one ounce to the ton, and the lowest average for a large quantity was 7 dwt. 10·9 grs., although the average of 8586 tons in the Ararat District was only 4 dwt. 9·4 grs. The pyrites and blanketings treated amounted to 1509 tons, of an average yield of 2 oz. 1 dwt. 15·78 grs. per ton; and 8785 tons of quartz tailings and "mullock" were treated, which yielded only 1 dwt. 11·88 grs. per ton.

Nova Scotia and this country can make a better showing than these figures indicate. The reports of the Mining Registrars, from which we take this information, contain much other matter going to show that the gold mining industry is not in a very booming condition, though no less than £181,059 19s. 4d. were paid in dividends during the quarter; that is, about $5 in dividends were paid out of every ounce produced, or 25 per cent of the gross product. This is by no means a bad showing on ores as low in grade (yield) as $10 a ton.

THE COAST SURVEY.

PROF. ALEXANDER AGASSIZ, having declined the superintendency of the Coast Survey, it is reported that the President is greatly in doubt whom to appoint, and that he is embarrassed in considering the names of certain navy officers by another doubt, to wit, whether an officer appointed to superintend the Coast Survey would thereby lose his permanent rank. Since the law requires that "officers of the army and navy shall, as far as practicable, be employed in the work of surveying the coast of the United States," it seems reasonable to suppose that an officer could be detailed to superintend that work. If that be done, no better selection could be made than that of Lieut.-Col. CYRUS B. COMSTOCK, whose conduct of the Lake Survey demonstrated that he possesses the precise combination of scientific with administrative ability required for the work. On the other hand, the detail of an officer of the army or navy to this service, instead of the permanent appointment of a superintendent, without other rank or relations, might affect the independent position of the Coast Survey, which is in some respects a good thing,

though it has been abused. The main point is, that the head of this important bureau should have both the scientific training and the administrative temperament. High personal character and attainments are certainly not enough. The flagrant abuses recently exposed in the Coast Survey had existed under a series of superintendents of scientific eminence and personal purity, under whose very noses evils existed unsuspected, in which they took no part, but which they should have detected and repressed.

Distinction in science is not incompatible with the administrative temperament; yet it must be confessed that they do not often coexist. Great thinkers and investigators are apt to have habits of concentration and reflection, indifference to details aside from their main purpose, and general "absent-mindedness," which make it easy to hoodwink and deceive them. To appoint such a man to superintend the Coast Survey would be the worst possible blunder; since he would certainly not be able to reform it thoroughly and direct it vigilantly; while, on the other hand, his fame and the general esteem in which he was held would prevent his removal for mere administrative incompetency, not involving personal delinquency. It ought not to be impossible to find a man combining the two requirements we have named; but of the two, let it be frankly avowed, scientific eminence is the less vitally important. *

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.]

Tests of Coxheath Copper Ore.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Some ten tons or more of ore from the Coxheath mine, of Cape Breton, owned by the Eastern Development Company, were smelted at the Bay State Smelting and Refining-Works, in East Boston, on the 6th and 7th of October.

The ore, which is reported to be the average run of the mine, consists of copper pyrites in a siliceous gangue, accompanied by a small percentage of iron pyrites, and assayed between six and seven per cent. But the peculiar interest of the test arises from the fact that both the fuel and flux, consisting respectively of coke and limestone and iron ore, were all brought from Cape Breton, being the same as would be used in smelting on the spot.

The run was made under the management of Dr. E. D. Peters, in a blast-furnace belonging to the works, and produced a matte assaying about 38 per cent of copper, while the slag carried less than one third of one per cent of that metal. The present aspect of the copper market offers little encouragement for the development of new copper enterprises; but with coke at 75 cents a ton, and labor and fluxes at very low prices, it certainly seems that copper can be produced about as cheaply at Cape Breton as at any place on the continent, provided the quality and quantity of the ore supply are satisfactory.

Dr. Peters reports the matte free from all deleterious substances, and certain to make copper of excellent quality.

Quite a number of Boston gentlemen interested in copper matters visited the works during the two days' run of the little cupola-furnace, and expressed much satisfaction at seeing such a fair test of the quality of the coke and the suitability of the fluxes. COXHEATH.

The Herreshoff Copper Furnace Work.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In answer to your inquiries, allow me to say that, since the description of my furnace was first published, I have greatly improved it and its *well*, which is its important feature. The old cuts will not fairly represent these improvements.

We are running our furnace easily on a low pressure of blast, but in the last twelve days we have smelted *each day* from 115 to 125 tons of roasted ore. During this time, the blast has not been off the furnace one instant. The arrangement of the well is now such that we might tap it out for six months or more without chilling up. The tapping takes place always in the same water-jacketed, conical hole. It required but a few blows with a light sledge. The well is never run empty; indeed, not enough allowed to run out to prevent the complete trapping of the blast, which is kept on all the time while matte is running out. No slag is allowed to run out of the matte-hole, this conical shaped water-jacketed hole being plugged up with a ball of clay while it flows. As we have it arranged, out of about 200 times we have tapped in the past twelve days, I am informed that not one miss plug was made. There is no brick in either furnace or well, and there is no wear on any part of the iron of either, they both being water-jacketed.

We are smelting with 1 coke to 7 to 8 of ore, and turn out a matte of from 50 to 57 per cent, starting from an ore of 5 per cent copper. We find the utmost capacity of our furnace to be from 140 to 150 tons of ore smelted in twenty-four hours.

At the tuyeres, the size of furnace is 3 feet 10 inches by 6 feet 10 inches, and from tuyeres to charging-door 8 feet. It is 12 inches wider and longer at the top than at the tuyeres. It is oval in section. Yours very truly,

LAUREL HILL, L. I., Oct. J. B. F. HERRESHOFF.

The Poetsch System of Shaft-Sinking.—This system of sinking through water-bearing strata, already described in the ENGINEERING AND MINING JOURNAL, Vol. XXXVII., p. 458, is now in progress at the Houssu Colliery, near Charleroi, Belgium. The sinking is 14 feet in diameter, and the sand-bed to be passed through is about 19 feet thick. The inventor has contracted to sink through this bed for the sum of £1000.

THE COPPER PRODUCTION OUTLOOK.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In the issue of the London *Times* of August 26th appeared a communication entitled "A Deluge of Copper." It commented on the remarkable increase of production since 1880, and predicted a similar ratio of increase in the future, especially from our mines.

I sent the following reply to the *Times*, but it has not yet appeared. As my letter presents a different view of the question, and, as I think, a more correct one, I should feel obliged if you could find space for its insertion. J. DOUGLAS, JR.

The title, "A Deluge of Copper," as applied to the copper trade of to-day, is hardly appropriate. It is true that, during the past five years, there has been an extraordinary increase in the production of copper, though not in a ratio beyond precedent. This your correspondent fails to note, and he omits to point out the still more important fact that there has been a corresponding and even more extraordinary increase in the consumption. The imports into England and France from January, 1881, to July 31st, 1885, have been about 547,000 tons; the consumption, about 550,000 tons. The visible supply is about 5000 tons less now, with Chili Bars at £42, than with Bars at £62. The deluge of copper has evidently not overwhelmed us thus.

The relation of value to supply in the metal market is one difficult to determine. The statistical condition of copper in the past has certainly not been the omen whereby to forecast prices.

There is no doubt, of course, that, if the supply of late had not kept pace with the increasing demand, the price would have been higher; but as there is not more than a safe stock in the world's storehouse—a stock less than when the production was less and the price much higher—it is fair to assume that the problem is not a simple one to be solved by mere inference to the law of supply and demand, whatever that law may be.

For instance, in August, 1879, the stock in England and France and of Chili produce afloat was 49,700 tons, and the price £53. In February of the following year, the visible supply had increased to 51,200 tons, and yet the price had run up to £72 10s. Why was this?

In this market, the statistical position can never be ascertained with accuracy; but during 1877, 1878, and 1879, the increase in production was only about 2000 tons. In 1877, the price varied from 20½ to 17⅞ cents; in 1878, the vacillation was between 17⅝ and 15⅞ cents; in 1879, with no increase in production and normal demand, the price continued falling till February, when Lake sold at 15½ cents, and common copper at 14½ cents. Then the reaction set in. Before the close of the year, the price had reached 21½ cents, and in January, 1880, touched 25 cents. During the summer of 1879, the country shook off the commercial lethargy that had oppressed it since 1872, and with the general revival of business, consumers took courage, bought more freely, laid in larger stocks than they had carried for years, and prices sympathized. The statistical position of the metal would seem not to have been the only cause of the rise.

As already remarked, the present rate of increase is not without a parallel. In 1850, the importation of copper ore and regulus, and copper wrought and unwrought, into Great Britain was 59,743 tons. In 1855, it had risen to 74,643 tons, or an increase in five years of 23,900 tons, or 47 per cent of the total imports of 1850.

The increase of imports into Great Britain and France, between 1879 and 1884, or during another period of five years, has been only 17,333 tons, or but 16 per cent of the imports of 1879. These quantities are of pure copper—those between 1850 and 1855, of copper ore and furnace stuff; but the comparison is none the less correct.

The rapid accession to the world's stock after 1850 was due to the development of certain copper deposits, known from time immemorial, in Chili, but then for the first time worked systematically with proper appliances. It is a significant fact that the increased production of this period did not depress prices; for in 1850 copper was worth only £63 a ton, while in 1855 it brought £100 a ton.

There can be no doubt, however, that, if copper should continue to flow in fresh streams through new channels as abundantly as during the past few years, the balance between supply and demand would be disturbed, and the market would be glutted. But there are no signs of such a catastrophe.

The smaller centers of copper production the world over are feeling acutely the low prices. Many foreign mines that have ranked in the second class are now run at a loss, as, for instance, the New Quebrada, Wallaroo, and Little Bay. In such cases, where there is no actual profit, there is no inducement to increase production for the purpose of maintaining a given dividend, as is done in the case of certain large mines that are supplying the deficit arising from reduced profits by an increased production.

Chili is exporting less than in her palmy days. Most of the great mines that have made her famous are decaying and approaching extinction. Of the three prominent districts of Tomayal, Carrizal Alta, and Chañaral, the last only is to-day prosperous. But that she maintains even her present production in the face of such a market is due to the favorable rate of exchange. Her miners and smelters really get now from 17 to 18 cents in paper money per pound of copper, and pay their labor in this currency at par. They are enjoying the same advantages as we did in the old greenback days at the close of the war, when, gold standing at 250, copper sold at 55 cents. The power of resistance of Chili's mines will be tested only when she returns to specie payment.

From the rest of South America, if we except the New Quebrada, of Venezuela, nothing is coming forward. The native copper beds of Corocoro, in Bolivia, are shipping no *barilla*, and not a single large copper mine has been opened in Peru, in Ecuador, in the United States of Colombia, in the Argentine Republic, or in Brazil. Vague notions are afloat that Peru is rich in copper; but for fifteen years the Peruvian Andes have been traversed by more than one railroad, and still Peru ships no copper. These are not unknown lands. They have been laboriously prospected for minerals for centuries past, and though a silver ore may be overlooked, copper is not a mineral that escapes detection.

The only profitable concerns under existing circumstances are some of the Spanish and certain of our own mines. Our production has doubtless been the most disturbing element in the copper market of late, while

the fear of an abnormal increase from America is the most depressing influence at present at work. The impression seems to prevail, and to be accepted as unquestionable, that, because within five years we have grown from being barely self-supporting, into one of the largest exporting countries, this rate of growth will continue as though we were endowed with the power of perpetual increase.

The history of our mining industry does not bear out this theory. Our methods partake of the impatient, live-for-the-present character of our people. A large mineral deposit is discovered, and the problem the owners set themselves to solve is, not how the utmost profit may be recovered in the long run, but how it may be made to yield the largest dividend regardless of waste, in the very short run. The most notable instance of the application of this method, and of its results, is the Comstock. A lode that should have been a source of wealth to Nevada and the whole country for centuries was worked out in less than half a generation, at a reckless cost and with appalling waste. The same inordinate haste to realize has characterized the mining of the Leadville lead ores, with the result of rapid exhaustion. It was applied to the Horn-Silver, of Utah, and already that splendid mine shows symptoms of rapid decline; and it ruined the Robinson Consolidated.

Gold mining commenced in the West in 1848. The gold product reached its maximum of $65,000,000 in 1853, and has since, with some fluctuation, steadily declined to $36,000,000.

Silver mining only attained important proportions in 1864, when the product was $11,000,000. The maximum was attained in 1878, by a production of $45,281,385, when a notable decline set in, which, however, was retrieved by the silver extracted from the Leadville ore.

I cite these instances to show that, under the high pressure system adopted here, maximum results are speedily attained, and as a consequence never maintained. Now, what has taken place in the case of gold and silver and lead will assuredly occur in the case of copper.

The sudden impulse to the copper production after 1880 was due to the opening of certain Western mines, and these both in the South and the North were awaiting the approach of railroads for their development. Once opened, they have been worked on the same extravagant scale as the gold and silver mines I have already referred to, and their life will necessarily be, like theirs, curtailed. Prior to 1880, one copper mine in Arizona, the Longfellow, had been worked, and its bullion carted many hundreds of miles to a railroad terminus; and one mine in Montana, the Gagnon, of Butte, whose copper carried a valuable amount of silver, could afford to cart its ore four hundred miles to the Union Pacific; but in 1880, the Southern Pacific was run through Arizona and New Mexico, and made connection with the Atchison, Topeka & Santa Fé at Deming. It was in that same year that the Copper Queen Company began operations at Bisbee; the Detroit Company at Clifton; and the Old Dominion Company at Globe; these, with the old Longfellow, are the only copper producers to-day. The ore-deposits from which they are extracting their copper had been previously discovered, but were utterly valueless till freight facilities were afforded. The territory has since been provided with another parallel line of railroad running only 200 miles north of the Southern Pacific, and with several feeders, and yet not another copper mine has been thereby fostered into prosperous existence. Innumerable enterprises, both in Arizona and New Mexico, have been started, furnaces have been erected on all sides, and little driblets of copper have trickled from them into the stream for a few weeks; but the bunches of ore that it had been hoped would support mines have been either entirely exhausted, or the ore has proved to be too poor for profitable treatment. The fact remains that, despite the promises made by the Verde, the San Carlos, the Pima, the Omega, and a number of other Arizona affairs, which all put up furnaces and ran them; and by the Santa Rita, the San Pedro, and another host of defunct concerns in New Mexico, the only copper producers to-day are the Queen, the Arizona Copper Company or Longfellow, the Detroit, and the Old Dominion. The last is now out of blast, but may resume work. The history of the Arizona Copper Company is written in Scotland, and can best be read there, and the Queen has lately been before the English public, which, however, failed to see the inexhaustible wealth in it that the promoters of the English companies offered them.

The same cause that stimulated the working of copper ores in Arizona has operated in Butte, Montana, the only other important center of copper mining in the West. Until the Utah & Northern Railroad approached the camp, smelting in Butte was out of the question. Immediately after freight facilities were afforded, huge works were erected all along the line of the one great lode that yields, with trifling exceptions, all the Butte copper, and there is now only one gap of undeveloped ground upon the lode. The principal mines, such as the Parrot, the Anaconda, the St. Lawrence, and the Colusa, are owned by companies that have invested very heavy capital in works, and continue mining between 1000 tons and 2000 tons of ore a day, regardless of profit and of the inevitable exhaustion. They are mining the rich decomposed surface ores, which are of necessity limited in quantity, and ere long they will have to face the problem of making a profit out of the leaner deep ores.

I am far from intending to belittle these mines; but wish merely to point out the fact that these great Montana mines contain lean deep ores as well as rich surface ores, and that, if the rich ores yield only so much copper, the lean will not yield more, and that therefore they are not capable of yielding an unlimited supply in a constantly increasing ratio.

It must not be forgotten, in judging of the future, that there was a day when California was to swamp the world with copper; its mines are now nearly all closed: when the rich surface ores of Ducktown raised the Tennessee mines into the first rank; they are also closed; when the same surface ores of Ore Knob, of North Carolina, would have made a casual observer laugh to scorn the idea that beneath them lay unaltered ore that would not yield 3 per cent; and when Vermont was the next largest producer to Michigan.

The West is wide, and, although there is probably not a single concealed and unknown copper deposit in it, it is possible that from time to time a great mine may be developed somewhere in the Rocky Mountains, but probably not oftener than an old one will drop out of the list.

The same is true of old Mexico. The accessible copper mines of the republic have been worked for generations; some of them are quite worked out. Others are known to exist in the fastnesses of the Sierra Madre, but their value or worthlessness will not be determined in this generation. Probably the most important group is on the Gulf of California. They have been exploited, and their ore shipped to England for a long time past, but a French company now proposes to work them systematically. It has occasionally happened that in certain localities and on certain classes of deposits, "systematic mining" has been less successful than unsystematic.

The only other new mining enterprise of any magnitude is the Grand Belt Copper Company, organized to work certain beds of copper ore in Texas, in the Triassic or Permian, similar to those in the Ural Mountains, worked by the Russian Copper Company.

Of even more importance to the copper market of the world than the Western yield, is the production of the native copper mines of Lake Superior. In 1884, there were twenty-six producing mines; twenty-five of them yielding from a few hundred pounds of copper to 5658 tons, the yield of the Quincy. The twenty-sixth, the Calumet & Hecla, produced 19,950 tons of copper, or 57 per cent of the whole, and this year its preeminence will be marked by a still larger output.

All these mines are wrought on a stupendous scale, though on lean ores; the Calumet & Hecla hoisting and stamping daily 2500 tons, the Atlantic 800 tons. Their mechanical equipment is undoubtedly superior to, and more costly than, that of any other mines in the world. The largest producers are from 1000 to 3000 feet deep. If we except the Osceola, the Wolverine, and the Tamarack—which is developing on part of the Calumet & Hecla bed on its dip, through a shaft 2400 feet in vertical depth, and which will necessarily not be a large producer for some time to come—no mines have been started since the Calumet & Hecla in 1867. The older mines are feeling the influence of deep working. Some of the large producers are struggling for existence with copper at 11 cents, and several of the smaller and weaker mines have actually discontinued operations. The Calumet & Hecla used to pay a quarterly dividend of $500,000. It had spare hoisting and crushing capacity and large reserves of ore when the decline in price occurred; and therefore, in order to sustain profits at as high a level as possible, it has lately worked its entire plant to its full capacity. Hence the rise in its production from 16,562 tons in 1883 to nearly 20,000 tons in 1884. It will this year show even a higher figure. But the limit has been reached, unless new shafts are sunk and new mills are erected, which it would take much time and much money to provide. It is certain, therefore, that, from this region, there will not be in the near future any great increase. If copper should fall another cent and remain at that figure, most of the mines would inevitably be closed.

If we review the copper industry of the world from the evidence afforded by the reports of public companies, and other reliable information, we should say that, at present prices, the limit of endurance, of all but a very few mines of exceptional character, has been reached, and these can not supply the world's wants.

Of Spain and Portugal, I hesitate to express an opinion. Copper being one only of the several valuable products of the same ore, the fate of these mines does not depend exclusively on the value of that metal. But of the mines of Chili and of this country I can speak from personal knowledge.

If Chili returns to specie payments before prices revive, her production will certainly fall below its present level, low as that now is below her maximum.

The New Quebrada, of Venezuela, if present prices prevail, can hardly continue the struggle it has kept up so bravely for so many years.

Australia is suffering severely, and some of her most famous mines are almost closed.

The Cape can keep up her steady supply; but it is not large, the stockholders merely suffering the inconvenience of reduced dividends.

Germany, through improved furnace methods of treating the Mansfeld schists, seems to more than maintain her position; and Japan is putting copper into the market, though whether it comes from accumulated stocks or from natural sources seems to be unknown.

In this country, during the past five years, there have been added to the mountain railroad system over 7000 miles of road, all of which is tributary to mining. There are now four parallel lines of railroad from ocean to ocean, traversing the continent, and three other parallel or diagonal roads intersecting the intermediate region, besides numberless feeders. The result is, that in this very short space of time, every mining camp in the West has been brought within reach of railroad facilities, and therefore the wonder is, not that there was a rapid increase of production, but that the production has been as small as it has proved to be, considering the extravagant statements of marvelous copper wealth here, there, and everywhere, which capitalists were asked by promoters to take in exchange for their moneyed wealth. The exchange has been made in numberless cases; but the capitalist has generally received in return only a confirmation of the fact known from time immemorial, and which yet every generation of speculative investors has to learn afresh, that nature is chary of her prizes, and that for one extraordinarily good mine, there are, the world over, ninety-nine uniformly bad ones. *Despite this extension of freight facilities, there has not been opened a single new lode or deposit on which work had not been commenced in* 1880; for the Anaconda, though a new mine, is on an old lode, and lies between mines worked prior to that date.

The increased production from Lake Superior comes almost entirely from the Calumet & Hecla, whose enormous plant is now utilized to its full capacity. The weaker mines of that region are succumbing, and from present appearances it seems probable that the decline from their stoppage will not be more than balanced by any increase from their stronger neighbors.

The enormous outlay and difficulties involved in starting a Lake Superior mine have been experienced by the Belt Company, of London, in its endeavor to resuscitate an abandoned group of mines in that region.

It must not be forgotten that mines do not last forever, even under the influence of the highest prices for their product. A quarter of a century ago, England produced 15,000 tons; she now produces only about 3000 tons. All the mines on this continent that were prosperous then—the Ducktown and the Ely in the East, the Minnesota and the Cliff on Lake Superior, the Bruce on Lake Huron, the Copperopolis, of California—are now closed.

The increased production of late years is due to one of those providen-

tial efforts by which nature provides for an extraordinary demand; but there is no surplus or other sign to indicate that the rank of copper among the metals, as determined by relative value, will be altered thereby.

OFFICIAL STATEMENTS AND REPORTS.

La Plata Mining and Smelting Company.

THE COST OF MINING AND SMELTING AT LEADVILLE, COLORADO.

The annual report of La Plata Mining and Smelting Company for the year ended June 30th, 1885, has been presented to the stockholders in London, and while it shows a profit for the year of $35,955 on the treatment of 6776 tons of ore, or $5.30 a ton, yet the company is issuing $50,000 of new bonds, to take the place of those already paid off. The sum of $4704, paid for improvements, was charged to capital account—the old familiar way of making the accounts show a profit. Every thing purchased at a mine should be charged to revenue after the original investment has been made and the mine put on a paying basis. Six thousand seven hundred and seventy-six (6776) dry tons of ore, of the "net cash value" of $147,660, or $21.80 a ton, were produced, and the mining expenses per ton were as follows:

Labor	$10.82	Development	$0.70
Supplies	2.31	General expenses	1.59
Hauling	1.08		
Total per ton	$16.50		

This is certainly *very much* above the average cost of mining in the camp.

SMELTING-WORKS.

The scarcity of ore rich in lead for flux was a heavy drawback on the smelting-works. We are told that as much as $40 a ton was paid for lead in the ore when only $32 a ton could be obtained for lead in bars. The furnaces, for this reason, were able to run only 77 per cent of the time, and smelted 42,491 dry tons of ore, at an average cost of $9.31 a ton, as follows:

Labor	$2.64	Fuel	$5.11
Supplies	.22	Flux	.72
Assay	.04	Water rent	.02
Transportation	.03	General expenses	.53
Total, per ton	$9.31		

This figure is also considerably higher than that at some of the other Leadville smelters.

A Workingman's Library from Mr. Carnegie.—Andrew Carnegie has presented the workmen at the Keystone Bridge-Works, of which establishment he is a large stockholder, a library building worth $25,000 or $30,000, and $1000 in cash for the purchase of books.

Manufacture of Aluminium by Electrolysis.—*La Lumière Électrique* says that Mr. L. Senet has devised a new process that permits of obtaining aluminium, as well as copper, silver, etc., by electrolysis. A current of from 6 to 7 volts and 4 ampères is made to act upon a saturated solution of sulphate of aluminium in the presence of a solution of chloride of sodium, the two solutions being separated by a porous vessel. There forms a double chloride of aluminium and sodium, which is decomposed; and the aluminium that is set free deposits upon the negative electrode. The process may be applied either for obtaining deposits of aluminium upon any objects whatever, or, what is more important, for the cheap manufacture of the metal.

Economical Use of Coal.—The steamer Burgos, built especially to carry cargoes cheaply at a low speed, recently left England for China with a cargo weighing 5,600,000 pounds. During the first part of the voyage, from Plymouth to Alexandria, the consumption of coal was 282,240 pounds, the distance being 3380 miles; the consumption per mile was, therefore, only 83·5 pounds, and the consumption per ton of cargo per mile, 0·028 pound; in other words, half an ounce of coal propelled one ton of cargo a mile. It is further stated that the best locomotive performance in this country shows a consumption of about two ounces of coal per ton of freight hauled one mile, at the rate of 13 miles an hour, including stoppages; on lines having grades of from 53 to 70 feet per mile, the consumption often rises to five or more ounces.

The Inventor of the Hot Blast.—A correspondent of the *Engineer* claims the invention of the hot blast, generally credited to Mr. James Beaumont Neilson, to have been really made by a Scotch blacksmith, John Buchan. He says: "His hot blast was obtained by placing coils of iron tubing immediately above the heat and flame of his forge, and driving the blast from the ordinary bellows through these coils to the fire. He was thus enabled to get a heat in much less time on a larger piece of iron, and more uniformly soft and mellow for welding, than by the common method. In those days, this proved to be a desideratum that brought grist to his mill from all parts in repairs to the anchors, etc., of the smacks plying between the ports of Carronshore and London, also in work from the numerous distilleries around, and it was not till after Mr. Neilson had paid a visit to 'Johnnie's shop' that the invention of the hot blast was given to the world."

A New Gold-Like Alloy.—The *Chemical News*, of London, calls attention to the fact that a new alloy, resembling gold in appearance, weight, and in withstanding the jeweler's test of strong acids, is extensively manufactured in England, chiefly, Mr. Lowe naïvely states, for the purpose of defrauding pawnbrokers, to whom articles of jewelry made of it are frequently offered in pledge. Mr. Lowe examined a bracelet that had been sold as gold to a gentleman in Liverpool. After scraping off the gilding, the article had the color of nine-carat gold. It was found on analysis to have the following composition:

Silver	2·48
Platinum	32·02
Copper (by difference)	65·50
Total	100·00

He adds that strong boiling in nitric acid, even when the article was left in it for some time, had apparently no effect upon the alloy. The alloy is called "mystery gold."

BUTTE, MONTANA, MINING NEWS.

Special Correspondence of the Engineering and Mining Journal.

In activity and solid progress, Butte City is the leading mining center of the West. It has had the advantage from the start of comparative freedom from wild-cat stock-bubble operations and grossly inflated valuations of mining property. On the contrary, a few sagacious capitalists took hold of some of the claims for development, and, to use a Western phrase, they have "staid with them" until they now have a respectable list of extensive mines, worked upon a large scale with the best modern appliances, but, for several reasons, with inadequate profits. These mines now sustain a population of from 15,000 to 20,000 people, besides stimulating the industrial growth of remote districts and giving the Utah & Northern Railroad a large part of its carrying trade. The canvass for the first city directory of Butte shows 7500 names. Great improvements in the city have been made. Gas and water have been introduced; a new court-house has been built; and it is estimated that at least $1,000,000 have been expended this year in new mills and buildings. The bullion production of the camp is steadily increasing. The shipment of silver bars is constant, and ranges from $115,000 to $125,000 in value a week, the ounce being reckoned at $1.29. For the week ended September 26th, 72 bars were shipped, aggregating $114,900 in value; and for the week ended October 3d, there were 76 bars from the following mills:

	Bars.	Value.		Bars.	Value.
Alice	30	$46,656	Silver Bow	8	$13,872
Moulton	23	33,648			
Lexington	15	29,088		76	$123,264

Each bar weighs about 100 pounds, and is about 500 fine, the alloy being chiefly copper. This bullion is sent by express to Omaha, to be refined. The project of starting a refinery here has been discussed, and it is believed that it would pay well; for there would be a considerable saving in express charges.

The cost of working ores at Butte varies, of course, with different mills. At the Alice mill, it is reported by Superintendent Hall to be a little less than $10 a ton, and the mining about $7. These figures seem particularly low, and show little cause for complaint; but the margin of profit does not correspond with them, taking the average value of the ores at $40. The loss in working continues to be great and there is great need of some more economical process, avoiding if possible the use of salt, and saving at least a portion of the base metals that occur in such large quantities, and which now go to waste.

The labor question is an important one, and is brought forward prominently by the recent order from the Knights of Labor, that the Chinese must leave Butte by the 1st of October. The Asiatics have not committed the offense of working in the mines; but they do a large part of the cooking and washing for the miners, and raise cheap vegetables, and are generally industrious and thrifty in positions where a "Knight" would starve or fail to give satisfaction. The morals of the Chinaman are complained of; but his real offending is, that his presence tends to cheapen labor. The Knights of Labor, however, do not control the mines of this camp, and dictate the rate of wages an employer shall pay; that is the special function of the Miners' Union, by which wages are kept at $3.50 a day, and any miners offering to work for less are driven out of the camp. Yet there probably a thousand idle men waiting for work. The action of the Union Pacific Railroad in employing the Chinese is loudly and fiercely condemned by the Knights of Labor, and it has hastened and given force to the anti-Chinese feeling, not only here, but throughout the Pacific States.

THE SALT MONOPOLY AND FUEL SUPPLY.

The Union Pacific Railroad management has not only deprived itself of any sympathy in the question of its right to employ the labor it prefers, but it is earning the execrations of the mine-owners here by its extortionate policy in regard to the supply of salt. This vital necessity to the mills, for chloridizing the ore, costs the silver mining companies of Butte about $26 a ton. The Alice Company alone consumes 300 tons a month, costing $100,000 yearly in round numbers.

Salt is cheap enough at Salt Lake, where it can be produced in any quantity at $1.50 a ton, or $3.50 on the railroad at Ogden; but the railroad adds $20 a ton for freight, while the same company can mine coal at a point 200 miles farther away and deliver it at Butte for $8.25, and presumably at a fair profit. But the Union Pacific has control of the salt supply, and intends to profit by it, even if it restrains enterprise and production. While the Northern Pacific road was approaching Butte, great hopes were indulged that at last this oppressive monopoly of salt would be broken; but it is believed that some bargain has been made by which the Union Pacific will still hold this very profitable trade, and in consequence, thousands of tons of the lower grades of ore must be thrown over the dump, unworked, and many claims must lie idle until the conditions of working are more favorable.

In regard to the lumber and fuel supply, about which some anxiety has been manifested, the dominant feeling is, that the camp is by no means dependent upon the Northern Pacific Railroad. It is asserted that there is timber enough within twelve miles to last for five years at least. An enormous amount is required; but the supply of fuel at present is ample, at $5.50 per cord delivered. The Alice Company has now 8000 cords piled up back of the mills, and 2000 cords are yet to be delivered. Other mills are correspondingly well supplied.

The new hoisting-works of the Alice, with direct-acting engines and flat steel wire cables, are in successful operation. The Cornish pump continues to give great satisfaction, and easily lifts the greatly increased flow of water at six strokes a minute. The cross-cut toward the main vein on the 800-foot level is now in 145 feet, and is expected soon to cut the vein—a result that will add largely to the value of the property. A cross-cut is also extending into the west country toward the Rooney, on the 700 level. The Curry, another parallel branch vein, is yielding excellent ore. They are now cutting out a chamber on the 600-foot level for an additional balance-bob to the pump-rods.

At the Lexington, the shaft is now down 800 feet, and will be sunk 200 feet deeper. This mine will soon have new hoisting-works run by a Corliss engine. The Moulton Company is sinking again from the 500-foot level, intending to open the mine to a depth of 700 feet. The mill is

run chiefly on ore from outside mines. Since January 1st, 1885, about 6000 tons have been milled from over 60 different claims. Besides the Moulton, the Silver Bow, the Dexter, and from fifteen to twenty stamps of the Lexington mill are run upon custom ore, showing that many small claims and mines are adding to the gross product of the camp.

THE BUTTE COPPER MINES.

The copper mines are in full operation, and the owners are not discouraged by the continued low price of copper. Improvements are making both in the mining and smelting plants. At the Anaconda, the shaft is to be sunk to the 1000-foot level, and meantime the ore is obtained chiefly from the St. Lawrence mine.

At the Parrot, Mr. Libbey is hoisting and sending to the smelter about 300 tons of ore a day, and could increase it to 400 tons, if desirable. The concentrating and smelting-works are in full operation, and are undergoing considerable enlargement. By the courtesy of the management, I had the privilege of inspecting the pneumatic process in full operation, producing about 30,000 pounds of black copper daily. The instant combustion of zinc, antimony, and arsenic when the blast is turned on is made evident by the immense volumes of white oxide escaping from the mouth of the converter.

Other copper properties are not idle. The Colusa and others are doing well under the present adverse circumstances. The Mountain View is simply prospected at present, but thousands of tons of ore are piled on the dump.

The important mining suit between the Rising Star Silver Mining Company and the Silver Safe Company, adjoining, which was to be tried at the present term of court, has happily been compromised on a basis that is honorable and satisfactory to both parties. WILLIAM P. BLAKE.

BUTTE, MONTANA, Oct. 6.

THE BEASLEY DEPHOSPHORIZING PROCESS.

This process, which is the invention of Mr. Joseph Beasley, was first put into operation at the Bromley Iron-Works, Pensnett, Staffordshire, about two years and a half ago, and it has been applied there to all the furnaces. It has continued steadily at work ever since, and it is stated that about 20,000 tons of bar iron of very superior quality have been pro duced there entirely from Northampton and cinder pig-iron. Its success, therefore, is demonstrated by two years and a half of steady practical working—a test to which it was predetermined that the process should be submitted before it was made public.

The Beasley process does not necessitate new plant or apparatus, but can be, and is, carried out with the ordinary puddling-furnace. It consists simply in employing a special kind of fettling in the furnace. This fettling is composed of one third calcined tap-cinder, or "bull-dog," as it is termed, and two thirds of ordinary rich ore, or of what is known as "blue billy." These are ground to the fineness of sand, and with each 100 pounds of this material is mixed 5 per cent by weight of hydrochloric acid diluted with an equal quantity of hot water. This mixture is allowed to stand for three or four days, during which time it is occasionally turned, so as to insure the thorough action of the acid upon the ore and "bull-dog." When the material is about to be used, ground lime and common salt are added to it, the lime being proportioned to the amount of phosphorus in the pig-iron to be puddled, and ranging from 20 to 30 per cent. The whole is then mixed into a stiff paste with water and plastered over the lumps of ore or "bull-dog," usually placed around the furnace bottom. Over this are thrown a few shovelfuls of a dry mixture, consisting of one third of ground ore and two thirds of ground squeezer, or hammer-slag, prepared much in the same way as the material for making the paste just described, but used as a powder without being incorporated with water. For puddling pig-iron containing from 2 to 4 per cent of phosphorus, a mixture is used consisting of ground puddler's tap-cinder or hammer-slag saturated with dilute hydrochloric acid and turned over during ten days. Neither salt nor lime is added to this mixture, which is laid on the furnace-bottom and forms the bath in which the phosphoretic pig is melted. In all cases when the iron is fairly melted and the slag has begun to thicken, the puddler throws on to the molten mass from 6 to 10 pounds of iron oxide in the form of simple rust. This addition causes a violent action in the mass of molten iron, and is held to play an important part in effecting its purification.

According to those who have carefully investigated the process, the first noteworthy result is an increase of from 5 to 10 per cent upon the weight of the pig-iron charged into the furnace, more pure iron being taken out from the fettling by the charge than in the ordinary process of puddling, in which the iron gained from the fettling passes into the slag and is tapped off into the cinder as a silicate of iron. The next result is, that the bars produced, when tested after reheating and rolling, are absolutely free from red-shortness, and on being nicked and broken cold, they disclose a highly fibrous formation fully equal to that of the best marked bars. Tests for tensile strength show an average breaking strain of 24 tons per square inch. With regard to the all-important question of cost, it is stated that the entire cost of all the materials used beyond those used in ordinary puddling does not exceed 1s. per ton of iron produced, while the gain in weight alone of the puddled bar made by the new process ranges from 5 to 10 per cent over that of bars produced by the old method. Thus, the cost of a ton of iron made on Mr. Beasley's plan is much less than that of a ton of iron made on the old principle, while the improved quality of metal produced enables a still larger profit to be realized. We thus have what appears to be a most important means of prolonging the life of the iron-making industry, and which stultifies the predictions of some of the more enthusiastic steel-makers.

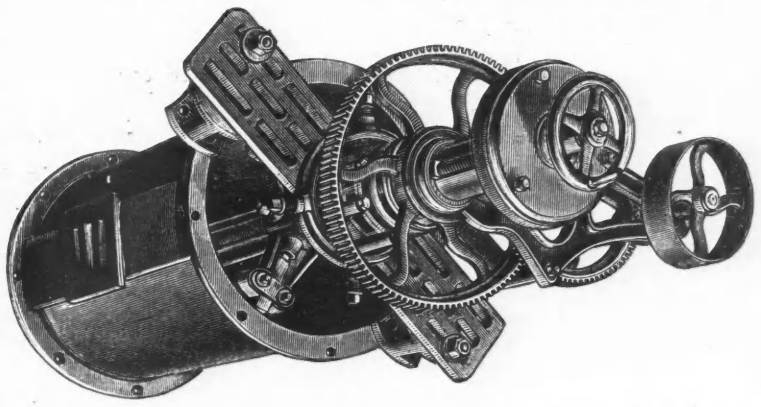
The Mineral Production of Greece.—The following table shows the mineral production of Greece in 1883:

	Metric tons.		Metric tons.
Manganiferous iron ore	56,803	Lignite	8,200
Ferruginous lead ore	33,938	Magnesite	3,642
Calamine, raw	2,601	Gypsum	426
" calcined	37,520	Mill stones	24,148
Blende, galena, iron pyrites	3,880	Pozzolana	37,000
Pig-lead	9,612	Emery	2,222
Manganese ore	400	Salt (evaporated)	13,860
Sulphur	14,175		

PORTABLE CYLINDER-BORING MACHINE.

The accompanying illustration shows a convenient form of portable cylinder-boring machine, which in many instances may be found convenient in boring out large wheels, pumps, and for other work of this kind in districts distant from machine-shops, or when the delay or the expense of sending the parts to a shop would be great. In fact, this would be an extremely useful tool at almost any large mining or metallurgical works. It is thus described by the manufacturers, the L. B. Flanders Machine-Works, whose address will be found in our advertising columns:

This bar is designed for boring steam-cylinders of engines, steam-pumps, steam-hammers, heavy housings, large wheels, etc., and in fact any thing that needs boring. It is made of different sizes ranging from 2½ inches diameter to 12 inches diameter. It will bore with one or both cylinder-heads off, either horizontal, vertical, or inclined, on the engine-bed or lying on the ground. The machine is so constructed that the



piece that is bored serves as the bed or support of the bar, making it entirely a portable tool, doing the truest of work, because no springing strains are brought on it.

It is built strong, with powerful geared driving-power, self-feed with two or more changes as desired; it is fed with a steel screw, and is built of the best of material and workmanship. Every machine has all the latest attachments. A bed or table with supports to use with our bar for new work is furnished, making a shop tool of it as well, and, when required, a facing-head for facing off cylinder flanges and turning them.

An Immense Lode of Silver-Bearing Ironstone.—A lode has been discovered at Carowa station, about sixty miles from Silverton, South Australia. It has been traced for over twelve miles, and in one place is 400 yards broad. A surface assay gives from 2 ounces to 24 ounces of silver a ton.

The Heaviest Pump-Lift in America.—The heaviest single lift on any mine pump in America is probably at the Acadia coal mine, Pictou, Nova Scotia, which is under the management of Mr. H. S. Poole. The mine is opened by a slope 2400 feet long; vertical depth, 1000 feet, or 435 pounds per square inch pressure on the pump. The pump is a Knowles, of the duplex-compound-condensing type, with high and low-pressure steam-cylinders, 12 inches and 22 inches diameter, 24-inch stroke, with four 5½-inch plungers working against a head of 435 pounds per square inch. The column is 6-inch diameter wrought pipe, fitted with flanges and Allison's vanishing thread. The air-chamber is 30 inches by 15 inches. Steam-pipe, 2600 feet long, four inches diameter, takes the steam from Babcock boilers on surface, working under a pressure of 105 pounds. The pipe is covered with infusorial earth from a local deposit. This pump started work last February, and has given no trouble, and none of the joints has leaked. There is no expansion-joint in the column. Seven 2¼-inch valves of brass, with leather face and rubber springs in each pot. The leather seats have been working for six months, and show no wear. There is no suction on the pump, the lower valves being below level of the sump. The pump usually makes 10 double strokes a minute, but could run 25 strokes, equal to 100 feet piston speed a minute. A small hydraulic ram will raise the water from the lower level to the pump.

Gas Cavities in Rolled Iron.—Some little time since, an article on this subject appeared in *Stahl und Eisen*, and in the last number of that paper a chemist, Arnold Friedmann, gives an instance observed by him, where he examined the contents of a large cavity formed in rolling a sheet 10 mm. thick from puddled iron. He drilled into the cavity under water and collected the gas contained in it. The volume of gas collected was a little over 100 cc., the cavity itself being equal to a volume of about 180 cc. The gas contained by volume:

	Per cent.
Carbonic acid	20·85
Carbonic oxide	70·42
Oxygen	0·85
Difference	7·88

The gas had not been collected quite free from air, which is the reason of the presence of the small amount of oxygen as above, which corresponds to 4·05 per cent of air in the gas examined, thus leaving a difference of 4·68 per cent still to account for. This was supposed to consist of nitrogen or hydrogen, or both, and could not be further determined. Inside the cavity was found a lighter-colored material in scales, easily distinguished and detached from the iron. This was collected and analyzed with results as follows:

	Per cent.
Silica	13·72
Lime	2·05
Magnesia	0·84
Manganous oxide	0·77
Ferric oxide and alumina	23·20
	100·58

COMMERCIAL ELECTROLYSIS.*

By Paget Higgs LL.D., D.Sc.

(*Concluded from page 236.*)

Before leaving the application of electrolysis to the production of copper on a commercial scale, it is necessary to mention another large works depending on electricity as a chief agent. The Italian Copper Mining and Electro-Metallurgical Company of Genoa has adopted the process for some time past at its works at Casarza, near Sestri-Ponente or Sestri-Levante. Part of the ore is smelted to a coarse metal or matte containing copper, 34·7; iron, 38·6; sulphur, 25·3, as given by a representative analysis. Another part of the ore is roasted and lixiviated, to obtain a solution containing as much copper sulphate as is required to render the ferrous sulphate of the anode available for the electrolytic decomposition of the copper salt.

The anodes are formed of the matte obtained directly after the fusion of the mineral, cast in iron molds in plates 32 inches by 32 inches by 1¼ inches. The melting is effected in a small furnace fed by a fan, and 15 tons of ore are operated on in twenty-four hours, yielding 50 plates, each weighing 176 pounds. To attach the plates to the conductor, small bands of copper are cast in, and to prevent these bands when in the bath being eaten through, the liquid of the bath is kept about three quarters of an inch below the edge of the plate. The residues from the anodes, after extraction of the sulphur, are returned to the furnace.

The cathodes are of very thin plates of red copper, 28 inches by 28 inches by $\frac{1}{64}$ of an inch, held in a wooden frame, and upon these plates the copper is deposited to a thickness of ¼ of an inch. By employing anodes of iron, copper, sulphur, such as ordinarily result from the first melting, the copper may be removed from the solution with an electrical efficiency comprised between 50 per cent, when there is no copper in the anodes, and of 100 per cent where, on the contrary, there is no iron. With the use of metallic sulphides in the anodes, all the sulphur contained in the mattes may be regained in a metalloidal state. The deposit is of good quality as long as the baths contain in solution about 0·1 per cent of copper. After exhaustion of the copper, the solution contains basic persulphate of iron, proto-sulphate of iron, and sulphuric acid.

To produce the electrolyte or sulphate of copper solution, very rich ores and mattes are roasted in a reverberatory furnace. The roasting is carried on so as to have more oxides than sulphides, because oxide of iron, not being soluble in dilute sulphuric acid, forms very little sulphate in the solution. Once prepared, the electrolytic solution is kept at normal strength of copper by circulation over roasted minerals. About 4 per cent of metal is contained in the solution at the commencement, and no change is made in the solution until, from excess of iron, the deposit of copper commences to become pulverulent and at the same time to disengage hydrogen. The baths are of wood, lined with lead, and are 6 feet 9 inches by 3 feet by 40 inches in hight. About a dozen of these baths are required to produce 2 cwt. of copper daily. Twenty machines are employed, arranged in two batteries of ten each, and each dynamo is connected with a dozen baths, arranged in chain. Turbines furnish the motive power. Each bath is composed of 15 anodes and 16 cathodes, placed 2 inches apart. The dynamos each furnish a current of 250 ampères at 15 volts.

ELECTROLYSIS OF OTHER METALS.

Although, in these papers, the particular metal copper has been dealt with exclusively, it must not be considered that either the subject, so far as regards this metal, is exhausted, or that commercial electrolysis is confined to this metal alone. In fact, there has been touched upon only the refining of copper from the crude metal or from the prepared mineral; no reference whatever has been made to the deposits of the metal copper upon other metals, which as a process aggregates in the world many thousands of tons weekly. In this commerce, copper appears a nearly indestructible material, because, no sooner is the article to which the metal has been applied worn out, than it can be, and is frequently, made the source of supplying this metal to a new object, similar electric currents being employed to effect its removal from the old object to the new as were used to cause its first deposition. Neither have the various applications of the electrotype process been alluded to either in regard to its use in daily printing or to its occasional employment in the replication of such massive works of art as the gates and doors prepared by Mr. Franchi for the authorities of the South Kensington Museum. All these applications are, however, more or less well known, whereas it is the aim of these papers to draw attention to those valuable and extensive commercial results that do not, in the writer's experience, appear to be matters of common knowledge.

This series of papers must, however, be limited to the metallurgical applications that have met with considerable application; otherwise, it would be necessary to include reference to the preparation of magnesium—a method that has much promise; the preparation of pure oxygen for the oxygenation, under the pressure obtained by electrolyzing the water from which the gas is produced in a confined space, of potable waters; the perhaps not so innocent improvement of wines and whisky, in which latter application a large works is being established by private hands; the preparation of pure alkalies, and some twenty other uses that have already passed much beyond the experimental stage.

To return, then, to the use in metallurgy of the electric current where commercial results have been obtained, there must be mentioned the refining of lead. This process is due to Mr. N. S. Keith, and [was] carried on by the Electro Metal Refining Company of New York. [This process, fully described and illustrated in the Engineering and Mining Journal, Vol. XXVI., July 13th, 1878, is no longer in operation. The New York works were closed some years ago.—Editor E. and M. J.

These articles have extended to such length that very little more can be done than merely to make reference to the various processes of treating ores and minerals directly by the electrical way. This is of less importance, as the various processes, although proposed by men of eminent standing, have not met with extended practical trial; and for this there is the sufficient reason that, with such metals as copper, lead, and zinc, the cost of electrical treatment is always likely to be much too high. With the precious metals, this objection will not apply; and here the electrician has before him an extensive field, especially with auriferous pyrites and the antimoniacal salts and arsenical sulphides of silver. But the proposition to treat gold, silver, and copper ores by electrical methods is of very old date. Becquerel, more than thirty years ago, proposed perfectly feasible methods, which were again brought to the notice of the scientific public in 1875 by the publication of the treatise, *d'Électricité et de Magnétisme*, C. and E. Becquerel. It is not here the place to give the details of processes that, however feasible in themselves, have not met with practical application even on a small scale. Yet, it would be very interesting so to do, and might be of some value, were it only to prevent the so frequent repatenting of these methods. Briefly, the treatment was based on the property that chloride of silver and sulphate of lead possess of dissolving in a saturated solution of sea-salt.

But Becquerel very clearly saw from the trials superintended by him at Grenelle that these electrical processes must necessarily be more costly than the processes of amalgamation and roasting commonly adopted. It is true that continuous currents were not then produced from dynamo-electric machines at the present cheap rate; but the electricity employed at Grenelle was obtained at a very small cost, too small to be the cause of economic failure of the processes.

Of the more recent processes for the treatment of gold and silver ores, that of Lambert has the greatest novelty. The ore is dissolved by nascent chlorine, obtained by the decomposition of a soluble chloride, with the aid of the electric current. A continuous subsequent treatment obtains the deposit of the metal. Polarization of the anode is prevented by constant motion imparted to the mass of ore. The apparatus consists of baths divided into two compartments by a porous division. In one compartment, is the cathode and solution from which the deposit is obtained; in the other, is a plate of carbon facing the cathode, and carrying transversal divisions, also of carbon. In these divisions, is placed the ore, which is agitated by a current of water.

Although electricity alone has not yet proved capable of providing means of reducing the precious metals from their ores, and may not and certainly will not do so until better knowledge is got of the actions involved, yet as an auxiliary it is of the greatest practical value. We refer to its combination with the process of amalgamation. In America, the patent electric amalgamators are very numerous, dating from 1859 and 1860. The first process to which attention is necessary was brought forward in 1869 by Nolf and Pioche, and this consisted in immersing the finely powdered ore in a solution of salt and of sulphate of copper contained in a wooden vat or cistern, the sides of which were furnished with copper sheets to within 3 inches or 4 inches of the bottom. In the center of the vat, was a vertical axle carrying agitating arms covered with copper, and extending to a layer of mercury in the bottom of the vat. This mercury, by the intervention of the agitator, was connected with the negative pole of a powerful electrical source, while the plates of copper were connected with the positive pole. The contact of the particles to be reduced being with this apparatus of an intermittent character, the operation was very lengthy. To remedy this, Partz carried out some improvements, but eventually adopted a process dispensing with the direct treatment of the ores and employing sulphides previously chlorinated by roasting.

There must, however, be distinguished two amalgamation methods, accordingly as there are two conditions in which the gold or silver exists. In those referred to, the metals are not in a free state, but are disengaged from their combinations by the electrolytic action, and the mercury might be suppressed if the deposit of metal could be made compact. Its use is, however, to fix at the negative pole those particles that, non-adherent to the electrode, would be carried away by the motion of the mass. In the processes of the extraction of metals by amalgamation, in which, either naturally or from previous treatment, the ore contains metal already reduced, the part played by the mercury is to extract this metal from the mass by solution, and to this action electricity is not necessary. It permits, however, of remedying some of the inconveniences of the process. At the contact of the different substances that contain the metal, the mercury oxidizes, and in this condition will not absorb the metal. The object of the use of the electric current is to produce hydrogen to reduce this oxide and render the mercury fluid. It was to produce this hydrogen, and the reduction, that Crookes employed sodium-amalgam. Barker introduced the amalgam of hydrogen with mercury by connecting this metal with the negative pole of a dynamo machine. Molloy combines not only the production of an amalgam of hydrogen, but adds others, such as the amalgams of sodium and potassium, as may be necessary to oppose the action of certain impurities of the ore. Thus, the process is adapted to situations where water is scarce and where no currents of water are available. As a rule, only about 4 volts electro-motive force are necessary for these amalgamation processes, and the quantity of current required is so small that it may be economically derived from a good battery.

The remaining metal to which we shall refer in these articles, as concerned in the extension of electrolytic processes, is zinc. The Lambotte-Doucet process has been applied to zinc ores at the Bleiberg mines. This process consists in dissolving the previously roasted ore in commercial hydrochloric acid, to obtain a concentrated and neutral chloride of zinc. The iron is eliminated by means of chloride of lime and oxide of zinc, being precipitated as ferric oxide. The chloride of zinc obtained is electrolyzed with carbon anodes and zinc cathodes. Under the action of the current, zinc is deposited on the cathode and chlorine is disengaged at the anode, by which polarization is quickly set up and the deposit of metal stopped. The use of anodes of carbon, however, may be regarded as always entailing, with so positive a metal as zinc, a great waste of energy. This remark applies equally to Luckow's process and to Létrange's method. Luckow directly employs the zinc ore as anode, and states that a convenient liquor for the direct extraction of zinc from blende is a solution of sea-salt slightly acidulated.

Létrange's process has been tried on the large scale at Romilly and St. Denis. Sulphate of zinc is obtained by roasting, a concentrated solution is obtained, and the metal is precipitated by the electric current from this solution. To produce 2000 tons of zinc yearly, the cost of works for the usual processes is estimated at £40,000, while with the use of electrolytic methods half the capital suffices. From twenty to twenty-five pounds of zinc can be produced daily per horse-power, as stated by Létrange; but M. Hospitalier disputes these figures, and states that it requires 5 horse-

* From the *Engineer*.

power to produce 2·2 pounds an hour, and that theoretically 2·6 horse-power are necessary to liberate 2·2 pounds of zinc. Practically, however, the writer would say that no reliance can be placed on the results of any method employing anodes of carbon, on account of the unknown and difficult polarization and secondary actions involved. The first step necessary to produce good results, and those that shall be economical, is the use of electrodes, or rather of anodes more nearly related in the electro-motive force scale than are carbon plates to zinc. The reason that carbon plates are used is, that the acid of the bath, or that set free, would attack ordinary metal plates. To avoid the use of carbon plates, Kiliani, of Münich, treats such zinc ores as calamine with an ammoniacal liquor containing carbonate of ammonia. When the liquor is saturated, it is filtered and electrolyzed with iron plates as anodes.

Were we to consider all the processes that have given successful results on a minor scale, we should have to include the production of many important chemical substances. Enough, however, has been advanced to prove the initial argument for these articles—namely, that electrolysis has a commercial value that is already of a high standard, but that its true value in the future is little appreciated.

THE RELATIVE MERITS OF IRON AND COPPER WIRE FOR TELEGRAPH LINES.

Mr. W. H. Preece recently read a paper before the British Association, in which he discussed the results of experiments made to determine this question. His conclusions, which we give, indicate a wide market for copper:

"Copper is gradually replacing iron for aërial telegraphs, owing to its greater durability in the atmosphere; but its greater cost has led to the use of smaller-sized wires. This can be done without detriment to the economy of the line, for the resistance of copper, as compared with iron, varies very nearly inversely as its price per ton, and hence the cost per mile remains about the same.

"It will be observed that copper shows a very decided superiority over iron, the speeds being as follows:

	Copper.	Iron.
Simplex working	414	345 words per minute.
Duplex "	270	237 " " "

"It is anticipated that the superiority of copper over iron indicated by these experiments will have a beneficial and economical influence on our telegraph system, and that its extended use will enable us not only to work better, but to dispense with intermediate repeaters in many cases where, on long lines, they are now necessary.

"The most interesting point, however, in connection with these experiments is, that they apparently prove that the superiority of copper is not simply due to its smaller electrostatic capacity and resistance, but that it is more susceptible to rapid changes of electric currents than iron; for when the resistance and capacity of the copper and iron wires were equalized by the insertion of resistance coils and condensers, the speed on the former was not thereby diminished. Possibly the magnetic susceptibility of the iron is the cause of this. The magnetization of the iron acts as a kind of drag on the currents. It is well known that telephones always work better on copper than on iron wires, doubtless for the same reason.

"These experiments also show the high speed of working that is now attained by the post-office authorities with the Wheatstone automatic apparatus. The following table gives an interesting *resumé* of the different stages of the process made, and its rate of growth:

1877	80 words per minute.
1878	100 " " "
1879	130 " " "
1880	170 " " "
1881	190 " " "
1882	200 " " "
1883	250 " " "
1884	350 " " "
1885	420 " " "

New Apparatus for Measuring the Modulus of Elasticity.—At a recent meeting of the Berlin Physical Society, Dr. König produced a new apparatus for the measurement of the modulus of elasticity, which was constructed according to the suggestions of Herr von Helmholtz, and was utilized in the Institute for measurements of elasticity. The modulus of elasticity was determined by loading in the middle a bar of the substance to be examined, resting both ends on firm supports. The flexion that set in was measured by means of the cathetometer, and, its value being introduced into the formula of the elastic theory, furnished the modulus of elasticity. A source of error in these measurements arose from the circumstance that the bar resting on edges was in part pressed in and sank, as a whole. This depression was the greater as the loading was greater, and it added to the magnitude of the deflex. To avoid this disturbance in the account, Professor Kirchhoff, in 1859, placed horizontal mirrors on the two ends of the bar, and, by means of telescope and scale, observed at each side the change in situation of each mirror, a change that occurred in consequence of the deflection under the loading in the middle, and which produced on both sides an opposite displacement of the scale. The sinking of the bar on account of the pressure on the edges, and even a slanting position on the part of the whole bar, exercised no influence on these measurements. The apparatus suggested by Professor von Helmholtz developed this principle still farther. It had two perpendicular mirrors, with the reflecting surface directed inward at the two ends of the bar; on one side, stood a scale, on the other, a telescope. The image of the scale fell on the opposite mirror, then on the second mirror, and thence into the telescope. If, now, the bar were loaded so that deflection occurred, then the image in the telescope became displaced to the extent corresponding with the angular changes of the two mirrors. By glancing, therefore, into the telescope, the whole amount of deflection might be very rapidly and conveniently measured, and the loading altered at pleasure. The commencement of the elastic after-effect might likewise be directly observed with great facility.

MODERN AMERICAN METHODS OF COPPER SMELTING.*

By Edward D. Peters, Jr., M.E., M.D.

CHAPTER IX.

THE SMELTING OF COPPER.

Both of these substances have a strong tendency to chill, especially when using the exterior crucible, which is for the most part prevented by the use of steep, which, besides being an excellent non-conductor, seems actually to generate heat—possibly from the slow combustion of its carbon—thus preserving the metal fluid, while any chill that may form in the crucible is easily removed without damaging its walls and interior, as would be the case with clay or brick-work.

The permanency of the basin and tap-hole depends greatly upon the quality of the steep, which should be made as follows: Crush the constituents separately through a 20-mesh screen, or as much finer as is practicable. A Bogardus or Sturtevant mill will be found useful for this purpose, and has a much greater capacity than the light stamps often used. Mix very thoroughly while dry, and moisten with water through a rose nozzle to such a degree that the mass will ball when pressed vigorously in the hand, without imparting any dampness to the skin. Tamp firmly with inch square bars, and avoid stratification by adding a shovelful at frequent intervals and before a hard surface is produced by the pounding. The following proportions are suitable for varying conditions. When the product is metallic copper, use by measure: 3 parts coke, 2 parts raw fire-clay; or 4 parts coke, 2 parts raw clay, 1 part burnt clay or ground brick; or 3 parts charcoal-dust, 2 parts raw clay, 1 part ground red brick. For a product of rich matte, use: 7 parts coke, 5 parts raw clay; or 3 parts charcoal, 2 parts raw clay, 1 part burnt red brick.

A large proportion of carbon counteracts the chilling of the metal and the consequent formation of skulls in the fore-hearth, but is less able to stand mechanical violence than the heavier steep, which has more plasticity. Charcoal-dust makes a somewhat fragile mixture, but an excellent one for retaining heat.

The arrangement just described is particularly suited to a small slow-running furnace, where it is intended to make a rich product, and where reasons exist for producing a slag sufficiently free from copper to be at once rejected. That this is perfectly practicable is demonstrated at various establishments in this country, where, by a somewhat lavish expenditure of fuel, a light blast, and a very slow run, a slag containing below 0·7 per cent of copper and exceedingly ferruginous is produced in conjunction with pig-copper. The material smelted is stall-roasted matte, with a very small addition of old brick and furnace ends, and in spite of the character of the charge and the powerful reducing action due to the slow run, the formation of all metallic iron is avoided—a result almost impossible to obtain in furnaces with an interior crucible.†

To prevent the delay arising from the frequent though slight repairs indispensable from this form of furnace, it is sometimes customary to widen the fore-hearth sufficiently to contain two crucibles side by side and used alternately.

The copper may be removed from the crucible either by tapping into molds of sand or iron, or by ladling, the latter method being more frequently employed where the product is pig-copper, owing to the difficulty of opening the tap-hole after a run of some length. For ordinary ore-smelting, producing a matte below 50 per cent copper—usually between 33 and 40 per cent—no arrangement can approach the modern brick fore-hearth for convenience, economy, and safety; nor can the solid brick base just described compare with the simple iron drop bottom, as used in cupolas devoted to the melting of pig-iron for castings. A most useful modification of this is shown in the illustrations of the Herreshoff furnace, in Vol. XIII. of the Transactions of the American Institute of Mining Engineers, and which we shall probably give next week. The profession is indebted to Mr. J. B. F. Herreshoff for this as well as for several other improvements in connection with this furnace. The author also desires to express his obligations to the same gentleman for many valuable practical suggestions that he will not attempt to specify in detail. The fore-hearth or "well" is here placed on wheels, for convenience of removal, though more frequently it rests upon the solid ground.

Another feature of especial value is the arrangement of the bottom of this furnace, which consists merely of a circular, concave cast-iron plate, firmly bolted to the lower border of the water-jacket, which extends some twelve inches below the tuyeres. This bottom is covered with a single course of fire-brick, resting on a shallow layer of sand, and might seem to be but a feeble barrier to such material as molten ore. It would, in fact, last but a very short time, were it not that the outlet of the furnace, through which all its liquid contents must pass, consists of a 4-inch by 7-inch circular opening through one side of the water-jacket, and is consequently so protected that the slag and matte can cut their way no deeper than the lower rim of the opening. There stands, therefore, constantly within the furnace a pool of molten material at least as deep as the lower border of the orifice referred to, while the constant loss of heat therefrom by radiation through the thin bottom of the furnace speedily converts it into a solid and permanent block, which need only be removed when cause exists for detaching the bottom. The most novel feature of this arrangement consists in a similar opening in the back wall of the movable fore-hearth, which, being also protected by a small separate water-jacketed plate, and backed up until it exactly meets the furnace opening, forms a continuous though very short water-cooled channel from furnace to fore-hearth. The slag discharge of the latter is several inches higher than this channel, so that when the well is full and slag begins to run over into the pots, the opening just described is covered several inches deep with liquid material, which stands at the same depth in the interior of the furnace as in the fore-hearth, except in so far as lowered by the pressure of the blast. The wind is thus completely trapped, and its constant blowing through, which is one of the most common and obstinate annoyances of blast-furnace practice, is effectually prevented.

The products of the fusion, usually only two in number in cop-

† The best example of this interesting but somewhat antiquated practice, though executed in brick furnaces, is found at Ely, Vermont, where there are some eight furnaces for the production of pig-copper in the manner indicated. Owing to legal difficulties, the works are not now in active operation.

per smelting, separate in this large fore-hearth very completely, the matte settling quietly to the bottom, while the slag flows through the anterior spout in a constant stream. When globules of matte begin to appear in the slag stream, as evinced by the sparkling of the same while falling into the pot, and its greater liquidity when a small portion of the suspected slag is caught in a shovel and inclined from side to side while cooling, the tap-hole in the side plate is opened with a pointed steel bar, driven in with a heavy hammer if necessary, and the metal allowed to flow into molds of sand or, in some cases, of cast-iron.

When the well is thus empty and the communicating channel between furnace and fore-hearth uncovered, the blast escapes through the same with full force, chilling the surface of the slag in its passage, and hurling glowing fragments of coke and globules of molten ore in every direction. This is completely obviated in the Herreshoff system by plugging the slag-spout opening with a ball of plastic clay heavily weighted. The fore-hearth being tightly covered with slabs formed of fire-brick held together by iron clamps, the blast is in this way entirely confined to the interior of the furnace, while the fore-hearth soon fills, and the wind is trapped as before.

Still another convenient feature is shown in the arrangement by which the matte, when tapped, is kept free from the aftercoming slag, of which a considerable quantity is present in the interior of the furnace and well, even after the appearance of matte at the slag-spout. As it is sometimes impossible or unadvisable to close the tap-hole at the exact moment when the last of the matte has escaped and the first of the slag begins to flow, Mr. Herreshoff has arranged a tilting iron launder between the matte-spout and molds, which, when held up by a chain passing over a pulley, conducts the liquid to the regular molds, but when released by a catch, turns upon a horizontal pivot, and conveys the slag in the opposite direction and into compartments in the sand, where it is obtained in proper shape for resmelting.

Brick fore-hearths of various patterns, but in the main resembling the type just described, have been in use in smelting sulphide copper ores for some eight or ten years, and are certainly superseding all other arrangements. A brick fore-hearth of this description, strengthened by iron plates cast dishing to prevent cracking, and firmly bolted together through projections at the corners, will last, according to the quality of the products and the rapidity of the process, for from two to thirty days, a week being perhaps the average life. Their destruction is brought about in two ways, by gradual chilling about the sides and bottom until the cavity becomes too small or tapping is rendered impossible; or by the cutting away of the brick lining from the action of a hot basic slag and a low-grade ferruginous matte. The former condition results usually from the presence of a siliceous, infusible slag, especially when accompanied by a matte of high grade, which, from its high conducting qualities, has a strong tendency to chill. It is also especially influenced by the rapidity of the smelting process, a quick run with a large stream of hot slag and metal keeping a basin open where the fusion of only half the amount in the same time would chill it within a few hours. Any long stoppage is particularly detrimental, and may spoil a new basin within the first few hours.

Even under the most favorable conditions, a certain minimum capacity, possibly about 20 tons in twenty-four hours, seems absolutely essential to the employment of the brick fore-hearths, and this minimum only if the matte is tolerably low grade—below 36 degrees. As this amount can usually be treated even in the smallest furnace likely to be erected, the conditions that forbid the employment of the brick fore-hearth do not often occur in the smelting of sulphide ores.

While the "chilling up" or "cutting out" of the old form of crucible in the interior of the furnace involved a costly and tedious series of operations, comprising the blowing out and cooling down of the furnace, the exterior basin can be taken down, replaced, and dried ready for work within a few hours; and it is here that the advantages of this method of practice become most apparent, as the stoppage of the blast for this short period causes little or no trouble in the furnace itself. The arrangement of the fore-hearth on wheels is a notable convenience, as the exchange can be made with great facility, and the new basin, heated to redness by a coke fire, is pushed into place between the two guiding rails, a gasket of clay being interposed between the respective abutting faces, to prevent the leakage of the liquid products. As soon as the connection is made between the main pipes and the diminutive jacket on the back plate of the fore-hearth, the clay plug with which the main orifice into the furnace was closed is pierced, and the process goes on with the slightest possible delay.*

After cooling the interior of the old fore-hearth with water, the iron plates are removed and the chilled mass broken into fragments for resmelting.

The chill usually consists of a mixture of slag and matte, and is seldom so difficult to handle as to require the aid of blasting-powder. This condition, when present, usually results from the deposition of metallic iron, which is sometimes found several inches thick and in a fine-grained, massive condition. It is best treated by exploding a cartridge of the strongest Giant powder upon it, though drilling is sometimes necessary. A ratchet-drill is used for the purpose, and a sample of borings from such a chill, analyzed for the writer by Mr. A. F. Glover, Ph.D., had the following composition:

Sulphur	4·64	Arsenic	0·11
Copper	9·80	Slag	0·78
Iron	82·70		
Carbon	1·12		99·96
Nickel and cobalt	0·81		

This substance may be felt as sticky, glutinous, semi fused mass in the bottom of the basin, and is often scraped out in considerable quantities after tapping. The life of the basin is also often prolonged by a systematic chiseling out of the sides, front, and bottom, whenever empty, and a careful and energetic furnace-man will keep his fore-hearth in condition for an extraordinary period.

The chilling of the basin is counteracted by any thing that checks the radiation of heat therefrom, and a backing of two inches of asbestos between the brick lining and iron plates is reported by Mr. Herreshoff to effect good results. The writer has used a mixture of wood ashes and crushed porous slag with good effect. The size of the basin varies according to the conditions of the case and the fancy of the metallurgist. A rectangle of 28 by 30 inches and 28 inches deep will be found convenient. It should contain from one to two tons of matte, and when inclined to chill, should be made larger at the commencement than under contrary conditions.

The amount of ore treated in water jacket furnaces of the same size and with exterior basin differs greatly, according to its fusibility, the quality of fuel, and numerous local conditions. A few examples from practice will assist in forming an estimate on this point.

(TO BE CONTINUED.)

* The time consumed in the above operation, as taken twice under ordinary circumstances, was 18 and 21 minutes.

A New Use for Asbestos.—In the processes connected with the dyeing and printing of cotton cloth, it is frequently necessary to hang the fabric in loops from parallel rods for the purpose of exposure to steam, air, or ammonia. In order that the cloth should hold upon the rods without slipping or being strained, it is necessary to wind rope of strips or cloth around the rods; but this only mitigates the difficulty without accomplishing its removal; for the heat and corrosive action of the vapors rot any covering in a few weeks, and the first notice of any deterioration is generally the appearance of small pieces of roll covering among the cloth in process of finishing. Recently, asbestos rope and asbestos cloth have been used for this purpose, and prove to be very durable. Larger ropes of this refractory material have been used for the transmission of power over places exposed to heat.

The Production and Price of Diamonds.—It appears that the production of the South African diamond-fields in July was, in round numbers, 170,000 carats, which realized £156,000, or 18s. 5d. per carat. In October, 1882, the production was 211,746 carats, which realized £355,315, or 33s. 7d. per carat. The reduction in the monthly production and in the selling price has not, upon the whole, been so great as appears from this comparison, as the output has fluctuated a good deal from month to month; nevertheless, the general tendency of the selling price appears to be downward, and the production has also been affected by serious falls of reef. It took the various diamond mines of the world two centuries, prior to 1870, to produce less diamonds than the Kimberley District has placed upon the markets during the last fifteen years. In view of this fact, and in view also of the gradual decline in the selling price, the conviction is forced upon us that the South African diamond-fields have been permitted to produce too rapidly. The existing state of affairs is forcing amalgamation upon the various South African diamond mining companies: this may have the effect of decreasing the output, but it is believed that the diamond trade will ultimately be brought into a healthier condition by it.

Railroad Relief Fund.—The Lehigh Valley Railroad Company has established a relief fund into which the employés put voluntary contributions, and for every dollar put in by a person in its employ the company puts in another dollar. Thus, if the 14,000 employés contribute a dollar each, the company will contribute $14,000. The management of the fund is in the hands of President Wilbur and Paymaster Wilhelm. In case a contributor is disabled by accident, he is allowed three fourths as much per day as his contribution in the fund for every working-day during his disability, for a period of six months. In case the accident results in the death of the contributor within six months, or if he is instantly killed, $50 is appropriated from the fund for the funeral expenses. If he leaves a widow and children under sixteen years of age, an allowance of one half the amount of his contribution, for every working-day, is appropriated and paid the widow for one year from the time of the contributor's death, provided she remains unmarried during that time. If there be no widow, then the allowance goes to the children, if any, for the same period. In case the contributor loses a limb, he is provided with an artificial limb, and employment is given to him.

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.

GRANTED OCTOBER 6TH, 1885.

327,516. Friction Drum. Alfred Briggs, Ottumwa, Iowa, Assignor to James T. Hackworth, Allen Johnston, William T. Major, and Albert G. Harrow, same place.
327,519. Journal-Lubricator. William H. Burden and Frederick C. Burden, Cleveland, Ohio.
327,525. Electric Valve-Operator. Charles L. Clarke, New York City.
327,535. Equalizer for Duplex Steam Pumping-Engines. Joseph D. Davies, Natchez, Miss.
327,541. Method of Making Illuminating-Gas. Walter P. Elliott, New Brunswick, New Jersey.
327,548. Valve. John M. Hartman, Philadelphia, Pa.
327,618. Gas-Furnace. William Swindell, Alleghany, Pa.
327,630. Reducing Clearance in Steam-Cylinders. H. Herman Westinghouse, New York City, Assignor to the Westinghouse Machine Company, Pittsburg, Pa.
327,659. Method of Getting up Steam in Steam-Boilers. William Craig, Brooklyn, New York.
327,678. Manufacture of Paint from Metallic Lead. William E. Harris, New York City.
327,703. Gas-Main. John H. McElroy, Pittsburg, Pa.
327,707. Apparatus for Mining the Beds of Rivers and Streams. John R. Moffitt, Chinese Camp, Cal.
327,708. Wet-Ore Concentrator. John R. Moffitt, Chinese Camp, Cal.
327,709. Retort and Crucible Furnace. John R. Moffitt, Chinese Camp, Cal.
327,711. Machine for Sanding Brick-Molds. Arthur Naylor, Cold Spring, New York.
327,721. Tube-Forming Machine. John L. Richter, San Francisco, Cal., Assignor to W. W. Montague, same place.
327,728. Rolling-Mill. Charles Schulz, Cleveland, Ohio.
327,743. Process of Utilizing Scrap from the Manufacture of Nuts, etc. Stephen Uren, Sacramento, Cal.
327,765. Pipe-Coupling Machine. Samuel Coburn, Altoona, Pa.
327,766. Ore-Separator. Ezra Coleman, New York City.
327,810. Non-Conducting Boiler-Covering. Truman Merriam, Milwaukee, Wis.
327,811. Slate-Dressing Machine. Adam H. Meyers, Melmore, Ohio.
327,835. Attachment for Lead-Pipe Presses. James Tatham, Philadelphia, Pa.
327,915. Concentrator. George S. Armstrong, Denver, Colo.
327,923. Rock-Drill Tripod. George R. Cullingworth, New York City.
327,942. Diamond-Drill Core-Breaker. John P. Griscom, Pottsville, Pa.
327,943. Diamond-Drill Core-Breaker. John P. Griscom, Pottsville, Pa.
327,944. Guide-Clamp for Drill-Rods. John P. Griscom, Pottsville, Pa.

FURNACE, MILL, AND FACTORY.

Under the new tariff law passed by the Congress of Ecuador in August, the new duties become operative after November 1st, and involve many radical changes in the direction of higher duties. Lumber, and perhaps other articles now brought from the United States, will be excluded by the new duties. As before, all duties are assessed on the gross weight of the merchandise, and for certain local improvements an additional twenty per cent on the import duties will be collected at the custom-house. The free list includes, among other things, materials for the construction of ships and mining machinery. The following are the important features of the tariff: A charge of fifty cents a kilogram on articles made of silver and gold and on valuable stones. Five cents a kilogram on iron ware, manufactured steel, manufactured tin, tin plates, kerosene of more than 150 degrees test, agricultural machinery of all descriptions, manufacturing machinery, ordinary metals in plates, bars, or pieces. Two cents a kilogram on wire fence, steel, tar, plows, picks, crowbars, shovels, hoes, iron chains, lime, iron trusses for roofs, iron and wire nails, iron in pieces, plates, and bars, corrugated iron, hammers, barrows, and carts.

The National Foundry and Pipe Company, Limited, which is locating its large works at Scottdale, Pa., expects to put the works in operation by the first of December. Mr. William Smith, formerly of the Smith Pipe-Works, of Pittsburg, will be the general manager. The main building will be 146 by 80 feet. One large pit has been constructed, with which pipe can be cast ranging from five feet in diameter down. Three or four smaller pits will be constructed. They will begin with a product of from 30 to 50 tons daily, according to size.

The Columbia Iron Company has been advised that the citizens of New Castle, Pa., have subscribed enough money, and that the ground would be given the company in case it decides to locate there.

Indications point to the resumption of the Leesport furnaces, at Leesport, Pa., by about November 1st. The furnaces have been idle, undergoing repairs, the past six months. Important changes and improvements are making, and a force of workmen is engaged in putting up a new hoister; new boilers are provided, and several are relining. The Pennsylvania & Schuylkill Valley Railroad track runs in close proximity to the furnaces.

The committee appointed to inquire into the capacity of steel-producing works in the United States met at Boston on the 12th inst. The members of the committee are Messrs. Hewitt, Burns, Crisp, Hiscock, Reed, Phelps, and Randall.

Parties are negotiating for the purchase of the rolling-mill and blast-furnaces at Wheatland, Mercer County, Pa., which have been idle for about twelve years.

The Riverside Steel Casting Company, of Chicago, Ill., will soon start its new steel-casting plant.

The Western Nail Association, in session at Cincinnati, on the 14th inst. unanimously adopted resolutions reaffirming the purpose of the members not to operate nail factories except on the manufacturers' scale, regardless of what time it may require to secure the full employment of the works; also reaffirming their purpose "to retain and continue all their present employés who may become competent workmen, and that they will not employ any other workmen except those who will work with and on the same terms as their present employés."

The Gadsden Iron Company has succeeded to all the property and business of the Coosa Furnace Company, owning the Coosa charcoal furnace, at Gadsden, Ala. Mr. A. J. Crawford has been elected president of the new company.

The Atlanta Bridge-Works, Ga., formerly run by Wilkins, Post & Co., is to be reorganized as a joint-stock company. Under the plan adopted, the creditors will take stock to the amount of their claims, and the new company will issue $300,000 in bonds, secured by mortgage upon the property, which bonds will be used to pay off prefered creditors. All the bonds have been taken, and all the creditors have agreed to take their proportion of the stock.

The Mancelona Furnace Company proposes to remove its plant to Mackinaw City, Mich.

The New England Manufacturers and Mechanics' Institute Building at Boston, Mass., was bought on the 15th inst. by James S. Edwards, the present owner of the land upon which it stands, for $13,200, plus incumbrances of about $15,000. The building originally cost $300,000, and was this year assessed at $237,000.

LABOR AND WAGES.

Operations were resumed in all the departments of the sheet-mill of the Reading Iron-Works, Reading, Pa., on the 14th inst., a compromise having been effected with the puddlers, who struck recently for an advance from $3 to $3.25 a ton, which action threw 200 hands out of employment. The management of the works has agreed to grant the advance after orders now on hand are filled, should the condition of trade then warrant it.

Lentz, Lilly & Co., made an effort last week to break the lock-out at their Park Place colliery, Mahanoy City, Pa., where, several months ago, the men and boys struck. The miners unanimously decided not to accept any thing but the old prices. When this decision was given to the officials, they immediately took steps to close up the entire works permanently.

The strike in the Poplar Creek coal mines, near Chattanooga, Tenn., has ended, the strikers accepting an advance of five per cent, instead of the ten per cent demanded.

The Nailers' Association of the Eastern and Middle States met in Harrisburg, Pa., last week, and decided to sustain the striking nailers west of the Alleghanies.

The trouble among the miners and laborers employed at the Dry Hollow ore mines and the Huntingdon Furnace in Warrior's Mark township, Pa., has subsided. An outbreak of the American employés against the Slavs and Italians was imminent until it was announced that the foreigners would be discharged.

Horner & Roberts, coal operators, have decided to start their Elizabeth mine at Monongahela River, Pa., at the 3-cent rate demanded by the men.

The strike of the iron-molders in Albany, New York, which began last May, ended on the 13th inst., concessions having been made on both sides.

TRANSPORTATION NOTES.

Arrangements are making for the opening of the Lake Superior section of the Canadian Pacific Railroad. A large traffic is expected on this route.

Advices from St. Paul state that the Omaha line has reduced rates on freight from all points on its system to Omaha three cents, making the rate from St. Paul and Minneapolis seventeen cents, as against twenty, the former rate. This is in consequence of a reduction made by the Milwaukee road on Saturday from Chicago from eighteen to fifteen cents.

The Chicago, Burlington & Quincy Railroad is to be extended to and through Bates County, Mo. This road would prove a valuable acquisition to Rich Hill coal-fields, giving another and direct line to Chicago, as well as the outlet to the southwest when pushed on to Texas and old Mexico.

The Hancock & Calumet Railroad (main line) is finished.

Right of way has been granted across the Calumet & Hecla location, Mich., for an extension of the Mineral Range Railroad, which will probably be built in the early future.

COAL TRADE NOTES.

CANADA.

PROVINCE OF NOVA SCOTIA.

The managers of the several Pictou coal mines are at present in this city to attend a conference of Montreal and New York capitalists for the amalgamation of the Pictou mines under one syndicate. This scheme was inaugurated by Sir George Elliott. It is said that the success of the negotiations depends upon the price placed upon the Albion mine.

IDAHO.

Anthracite costs about $20.50 a ton, delivered, in either Hailey or Ketchum.

ILLINOIS.

The Governor has appointed the following Mine Inspectors for two years, from October 1st: Alexander Ronald, of Streator, for the First District; Thomas Hudson, of Galva, for the Second District; James Freer, of La Salle, for the Third District; Walter Rutledge, of Alton, for the Fourth District; and Robert Winning, of Carterville, for the Fifth District.

T. H. Watson has sold what is known as the Cobbey mine to the Brazil Block Coal Company. This company has increased its capital stock from $400,000 to $1,000,000. This is the tenth shaft secured by the company in the Brazil District, and others are in negotiation.

INDIANA.

Robinson Brothers, of Pittsburg, on the 13th inst. sold $5000 Chartiers Block Coal Company 6s at pa and interest, closing out the last of the issue.

MARYLAND.

The Cumberland Coal Company, of Baltimore, has been incorporated by Henry G. Davis, of Piedmont, West Va.; Stephen B. Elkins, of New York City; Arthur P. Gorman, of Howard County, Md.; William H. Gorman, of Anne Arundel County, Md.; and Robert Ober, of Baltimore. The operations of the company are to be carried on in Maryland and West Virginia, and the principal office will be in Baltimore. The capital stock is $30,000, divided into 300 shares of $100 each. Mr. William H. Gorman is to be the manager. It is understood that this new coal company has secured the ownership of coal property near Piedmont.

Mine Inspector Sheridan recently inspected the operation of the ventilating fan at the Hoffman mine. Careful observations were taken, from which he reached the conclusion that, with 80 revolutions a minute and water-gauge 2 inches, 95,200 cubic feet of air are every minute drawn through the mine. This draught exceeds that of any other mine in the region.

MONTANA.

It is reported that the Horr coal mines, at Cinnabar, have been leased for a term of years by J. K. Pardee, of Philipsburg, and other gentlemen, and that a large force of men will be immediately put to work to take out coal for shipment to Wickes and other portions of the territory. It is said that the Cinnabar coal-fields yield a superior quality of coal.

PENNSYLVANIA.

ANTHRACITE.

The sentence imposed by Judge Woodward, of Wilkes-Barre, on Christian Coonrad, the mine-boss of the West End colliery, at Mocanaqua, was, that he should pay a fine of $50, with costs of prosecution, and stand committed until the sentence was complied with. Coonrad immediately paid the fine and costs, aggregating $200.

COKE.

Fifty ovens have been fired at the new Mammoth coke-works of J. W. Moore, in the Pleasant Unity District.

The Fayette furnace and coke-works at Oliphant are for sale. Several Eastern capitalists have been on the ground examining the plant with the view of purchasing it.

WEST VIRGINIA.

The first shipment of coal has been made by the New England, Fairmont & Western Gas-Coal Company, of Baltimore. The company has recently been incorporated. The mines are situated near Fairmont.

GAS AND PETROLEUM NOTES.

The Chief of the Bureau of Statistics reports that the total values of the exports of mineral oils from the United States during the month of September, 1885, and during the nine months ended September 30th, 1885, as compared with the corresponding periods of the preceding year, were as follows: September, 1885, $5,404,568; September, 1884, $4,922,347. Nine months ended September 30th, $37,105,726; for 1884, $35,336,879.

Exports of refined, crude, and naphtha from the following ports, January 1st to October 10th:

	1885. Gallons.	1884. Gallons.
From Boston	7,050,789	5,906,856
Philadelphia	118,910,280	74,742,981
Baltimore	8,825,774	11,567,221
New York	292,651,445	297,792,076
Total exports	427,438,288	390,009,134

Proposals are invited until October 24th for furnishing and delivering 100,000 gallons of mineral oil at the Jeffersonville depot, Q. M. Department, Indiana, in cases of two five-gallon cans each. Preference given to articles of domestic production and manufacture, and such preference given to articles of American production and manufacture produced on the Pacific coast, to the extent of the consumption required by the public service there.

PENNSYLVANIA.

The largest natural gas well in Washington County, and the second in size in the country, was struck on the 12th inst., on the Horton farm, near Canonsburg.

The well is owned by Guffy Brothers. Advices from Pittsburg state that natural gas is rapidly taking the place of coal in that city. Over 1500 dwelling-houses, 66 glass factories, 34 rolling-mills, and 45 other industrial establishments are supplied, and as nearly as can be ascertained, from 8000 to 10,000 tons of coal are daily displaced.

A contract is said to have been signed between New York capitalists and members of the Westinghouse syndicate, of Pittsburg, for converting natural gas into a rich illuminant.

It is stated that the demand for natural gas in Pittsburg is steadily growing, and that the Philadelphia Company is compelled to refuse many applicants for the gas for the present, owing to the fact that it has none to spare. The Bank of Pittsburg is having its building fitted up for the use of natural gas.

The Union Oil Company, of Rochester, has purchased oil leases of 600 acres of land northeast of the Mount Nebo well. A well will be sunk at once. The tubing in the Mount Nebo well has been repaired, and it is expected that pumping will begin next week.

Another big well was struck on the 13th inst. in the Smith farm, a few miles above Pittsburg, in which gas was found at a depth of 1350 feet, with the remarkable pressure of 500 pounds per square inch. It will be piped at once with the city by the Philadelphia Company's lines.

GENERAL MINING NEWS.

ARIZONA.

PIMA COUNTY—QUIJOTOA DISTRICT.

The Peer, Peerless, and Crocker mining companies have made their first shipment of bullion, amounting to about $20,000. Work in and about the mines is progressing as usual. The various stopes, cuts, and winzes on top of the hill show up well. The stopes in the Crocker north drift also show up well. There will be sufficient room in a very short time at this point to work a large force of men, as the ore-body is 14 feet wide. The mill is running to its full capacity.

CALIFORNIA.

MONO COUNTY—BODIE DISTRICT.

During the nine months of the present year, bullion valued at $310,519 was shipped from this district.

Bulwer.—The official report for the week ended October 5th shows that the south drift from the main north uprise is out 52 feet. The vein continues very strong and regular, with fine walls and clean filling of ore three feet wide, assaying $11 a ton. There are strong hopes of getting a good pay-chute of ore before reaching the old shaft. The Ralston vein No. 2, south, is small, but will probably make bodies of ore in places. The ore is of good quality, and is stored in the chutes.

Consolidated Pacific.—Winze No. 2 has been sunk to a depth of ten feet; the ground works fairly, and the vein looks as well as when first cut.

Mono.—It is reported that rich ore is found in the south drift from No. 1 winze, 550 (Lent shaft) level.

Standard Consolidated.—The company employs fifty men. The general appearance of all the drifts continues to be good. The retimbering of the shaft at the 500 level progresses favorably. The ore shipped to the mill for the week ended October 7th was 321 tons. The delivery being limited to the amount required for the Standard side of the mill, it is deemed advisable to continue the milling of tailings on the Bulwer side during the present favorable weather.

SIERRA COUNTY.

Marguerite.—It is stated that this mine will not resume operations before next spring, owing to a disagreement among the owners.

CANADA.

PROVINCE OF MANITOBA.

According to Manitoba exchanges, a number of Winnipeg and St. Paul capitalists are preparing to ship a car-load of iron ore from the Lake Winnipeg mines to Chicago, where it will be tested. If the results are satisfactory, the Fargo car-wheel works are to be handed over to these gentlemen, who will at once put them in operation, using ore from these mines. They have secured the privilege of mining 20,000 tons of ore a year for twenty-five years. The ore is to be carried all the way by water, transhipping taking place at Selkirk, where lake barges will be exchanged for river vessels. It is claimed that this ore can be laid down at Fargo $6 cheaper than ore mined at Duluth.

PROVINCE OF NEW BRUNSWICK.

Westmoreland.—This company is forming at Dorchester with a capital of $500,000. The object is the mining and reducing of copper, gold, and silver ores and minerals.

PROVINCE OF NOVA SCOTIA.

New Albion Gold Mining Company, Limited.—Another bar, the final clean-up for September, has been shipped, making the product for the month 1369 ounces of gold.

PROVINCE OF QUEBEC.

The shipments of phosphates from Montreal for September amount to 3263 tons; total for the year to September 30th, 17,853 tons.

COLORADO.

ALMA COUNTY.

Governor.—The sale of this mine and mill is reported. Business is to be on carried on an extensive scale.

CLEAR CREEK COUNTY.

Colorado Central.—The company's product for September was 115 tons, for which it received $25,003.75.

CUSTER COUNTY.

Bull-Domingo.—An ore-body has been opened up at the 550 level. The sinking of the main working-shaft has been steadily advancing. The tunnel is driven at the rate of about one and a quarter yards a day. The distance to the ore-body, as shown by the winze last fall, is 127 feet, so that within thirty days it may be expected this mine will be a regular producer again. The steam-drills will also be set at work, to go down another 100 feet on the shaft, to be prepared for another deposit when this chamber shall be worked out. Steam-boilers that originally were bought for the Bassick, and finally sold under an order for attachment, have been purchased. These will increase the motive power about 200 per cent.

DOLORES COUNTY.

Mr. Linwood O. Towne has furnished us with the following notes:

C. H. C.—The half-ownership in this mine, formerly owned by Mr. A. P. Adams, of Albany, New York, has, together with some other small interests in the vicinity, just been purchased by Mr. T. Dean, of New York City, President of the Grand View Company, at a reported price of $50,000.

Grand View.—The smelter has been having a most successful run, under Mr. Bryan as metallurgist, shutting down from temporary lack of charcoal. The ores used in the run, besides those from the company's own mines, were from the Sheridan, Mendota, and other Telluride and adjoining ores.

Hope & Cross.—A lease on these mines has just been effected by Messrs. Waring, Iler & Reed.

Pasadena.—This smelter is on the thirteenth week of its continuous run under Mr. Samuel James, Jr., and a large quantity of Rico ore has been put through, together with those from Telluride, Ophir, and Trout Lake districts.

Rico Reduction Company.—The mill of this company is in successful operation.

HINSDALE COUNTY.

Vermont.—Mr. Herbert Strickland has tendered his resignation as superintendent of this mine, to take effect October 1st. From that date until further orders, the mine will be in charge of Mr. W. Weston, of Ouray, as manager.

LAKE COUNTY.

The Leadville *Herald* reports the following:

Colonel Sellers.—The owners of this mine have ordered a very complete concentrating mill to be erected at once. The mill will contain, besides the usual equipment of crushing machinery, six four-compartment jigs, and tables or belts for the concentration of slimes. The mill is to have a capacity of from 50 to 60 tons of crude ore a day.

Evening Star.—The shipments during September amounted to 160 tons of lead ore and 1436 tons of iron ore, making a total of 1596 tons.

Iron Silver.—The ore-shipments during September were a little in excess of 3000 tons.

Little Chief.—The product of the mine during September amounted to about 68 tons of silver and lead ore, and 200 tons of silver and iron ore. The prospects of the property are fair. A larger output for the month would have been reported, but for the fact that the lessee of the northern end of the lode suspended the extraction of ore when he heard of the Chrysolite strike, and began prospecting for a continuance of the rich ore within the limits of the Little Chief territory.

Louisville.—The ore-shipments of this mine, on Iron Hill, which discloses some new ore-bodies, will this month amount to about 1200 tons. The ore nets above smelting and freight charges from $25 to $30 a ton.

Morning Star.—During September, there were produced and shipped 315 tons of silver and lead ore and 1125 tons of argentiferous iron ore, making a total of 1440 tons.

Quartette.—The sinking of a new shaft on this property, on Little Ella Hill, has begun. The location of the shaft was within the apparent course of the Cleveland ore-chute.

Shields Mill.—Experiments are making at this mill, in Colorado Gulch, in chlorinating and leaching the products of the mines of Little Frying Pan Gulch.

Smuggler Consolidated.—This property will probably soon be worked again by the company.

Terrible.—The Adlaide mine, the property of the Terrible Mining Company, yielded during September nearly 600 tons of ore. This is probably the largest production made by this mine in one month for over a year past. The property discloses considerable good ore. Among the more recent discoveries in the mine is a six-inch streak of ore, which assays 10 ounces in gold, 13 ounces in silver, and 48 per cent in lead. The entire property is worked under the leasing system.

PITKIN COUNTY.

Late Acquisition.—An important strike has been made in this mine on the west end of Aspen Mountain.

Spar.—Mr. Gillespie, of the Spar mine at Aspen, has under consideration the advisability of erecting leaching-works for the treatment of from 20 to 60-ounce ore. This and other Aspen mines are producing large quantities of this grade of mineral, which at present is almost valueless.

SAN JUAN COUNTY.

Several important strikes are reported in the mines of the Silverton District. One was made in the Blizzard, situated in Dry Gulch. The ore is a gray carbonate.

London.—It is reported that this mine, near Mineral Point, which has been idle for several years, and abandoned time and again, is in bonanza. It is now owned by Mr. F. E. Miller and others, and work was started up a few weeks since in the old workings.

DAKOTA.

LAWRENCE COUNTY.

Father de Smet.—Official reports for the week ended the 8th show that 1975 tons of ore were milled. Bullion produced and shipped to New York, 1215 ounces, making the total shipped during September 2026 ounces. There is no change in the appearance of the mine.

PENNINGTON COUNTY.

Harney Peak Tin Mining Company.—Machinery for the reduction of tin ore is on the road to the mines. The contract for erecting a mill building has been let.

IDAHO.

Eureka.—Work has been started up on this mine at Bullion, the work for the present to be confined to pumping out the water and clearing the drifts. After this is done, the property will be inspected and a decision will be made on the question of easing up or pressing the work.

Parker.—The face of the prospecting-drift or tunnel, on the fifth or lowest present level of the Parker mine, has recently shown favorable indications. The fifth level is opened at a depth of between 700 and 800 feet. This is said to be the greatest depth yet attained in any Wood River mine.

MEXICO.

A special dispatch from Eagle Pass, Texas, says that, acting under imperative orders from President Diaz, the governor who dispossessed the American miners from Los Cruces silver mines has been compelled to surrender the mines to their American owners. This is done through the intervention of Secretary Bayard, who, upon the investigation and report of Consul Pridgeon, at Piedras Negras, made a formal demand upon the Mexican government for the restoration of the mines to their rightful owners.

St. Louis-San Felipe.—This company has been organized at East St. Louis, Ill., with a capital of

$1,500,000, for the purpose of carrying on a general mining business in Mexico.

MICHIGAN.

COPPER MINES.

The September reports of the output of the Lake Superior copper mining companies compare as follows with those for the same month in 1884 and 1883 :

	1885. Tons.	1884. Tons.	1883. Tons.
Calumet & Hecla	2,467	2,435	1,679
Quincy	351	336	336
Atlantic	214	192	159
Franklin	202	182	188
Allouez	....	120	105
Huron	115	121	58
Copper Falls	65	61	..
Hancock	.....	39	37

CALUMET & HECLA.—The new machine for framing or tenoning timber for underground work in the Calumet & Hecla mine has been put at work, and although it was its first introduction to a class of work required of it, its efforts were a pronounced success. About a dozen pieces of green hemlock timber, fourteen inches square, were placed upon the machine at once, and within half an hour they were all dumped off with a double-tongue tenon cut on both ends, complete. The machine is fitted for various forms of tenoning or framing, and if the initial work is merely a sample or trial work, there is no telling what it can do when in thorough running order.

TAMARACK.—It is expected that the two heads of stamps leased from the Osceola will soon begin pounding Tamarack rock. The promise is 25,000 pounds a day.

GOLD MINES.

ROPES.—This mine will shut down for the winter. Superintendent H. C. Southworth has resigned his position, and will be succeeded by George Weatherstone. Some disagreement in the management is reported. The last assessment of 10 cents a share, made July last, has not been fully paid up. It is the intention of the company to start again next spring.

IRON MINES.

The following statement, published by the Marquette *Mining Journal*, shows the amount of iron ore and pig-iron shipped from the lake ports of that district for the season, up to and including October 7th :

	Gross tons.
Marquette—Iron ore	615,024
L'Anse—Iron ore	20,027
Pig-iron	6,613
St. Ignace—Iron ore	79,324
Pig-iron	6,709
Escanaba, Marquette District—Iron ore	428,828
Menominee District—Iron ore	565,393

MCCOMBER.—This mine is now in the hands of the executors of the Pendill estate, the McComber Iron Company having been dispossessed of the lease, and it is said that mining operations will soon be resumed.

PITTSBURG & LAKE SUPERIOR.—The two shafts sinking on this company's property, to reach the deposit found two years ago by the diamond drill, are down 60 feet. One shaft has reached the ledge, and work on one is somewhat retarded by an excess of water. This will soon be obviated by the addition of greater pumping facilities.

MINNESOTA.

The Minnesota Iron Company's shipments of ore from the port of Two Harbors for the week ended October 7th amounted to 7225 gross tons ; and for the season up to and including the same date, its shipments aggregated 189,676 tons.

MONTANA.

SILVER BOW COUNTY.

J. R. WALKER ET AL. VS. MOULTON MINING COMPANY.—The suit of Walker *et al. vs.* the Moulton Company came up in the District Court, at Butte, on the 2d inst., on the motion of the plaintiffs for a continuance, on the ground that certain material witnesses for them were beyond the jurisdiction of the court, and could not be reached in time to have the case heard during this term. In accordance with the law, the motion was sustained by affidavits setting forth what was expected to be proved by the absent witnesses. The counsel for the Moulton offered to admit as evidence all the alleged statements of the absentees, and quoted the law to show that if he did so there could be no continuance. The judge did not agree with this proposition, and the cause was continued.

NEVADA.

ELKO COUNTY.

NAVAJO.—The committee appointed by the dissatisfied stockholders has begun the examination of the mine. With the exception of the 650-foot level, the examination was almost exclusively in the old workings of the mine.

ESMERALDA COUNTY.

There has been quite a stampede of prospectors from the little mining camps along the line of the Carson & Colorado Railroad during the past three weeks, all bound for the new Eldorado recently discovered in this county, near Hawthorne, known as Lake District. In this new mining camp, it is alleged that a vein of gold-bearing quartz has been uncovered several feet in width. On this vein, the La Panta and several other claims have been located. It is reported that one of these claims was recently sold for $35,000. A town-site has been laid out in the new camp, and called Lake City.

STOREY COUNTY—COMSTOCK LODE.

CONSOLIDATED CALIFORNIA & VIRGINIA.—It is rumored in San Francisco that the number of shares represented by proxy at the annual meeting will be unusually small. Senator Fair is credited with having quietly accumulated large blocks of shares in the mine during the past six months. The Consolidated Virginia shaft is now in good repair from the surface down below the 1400 level.

HALE & NORCROSS.—The progress in driving the south drift on the 3100 level has been somewhat slower than was anticipated, on account of running it on a down grade for draining purposes. The face of the drift is still in vein matter. When the connection between the bottom of the winze and the Combination shaft is made, two cross-cuts will be started simultaneously to the west ; one directly under the bottom of the main incline winze, and the other about 50 feet south of the station on the 3100 level of the deep winze.

JULIA CONSOLIDATED.—George W. Mawson and B. Dougherty have brought suit in San Francisco against this company to recover $400,000, which, it is alleged, was acquired in the transfer of the property to the Ward and Bullion companies. The plaintiffs state that they are acting for all the shareholders of the Julia Company, whose trustees have refused to join in this suit. They also ask for an accounting of all the ores taken by the Ward Company out of the Julia ground, and that the defendants, other than the Julia Company, be restrained from issuing any portion of the property belonging to or assigned by the Julia Company until the sum of $400,000, with interest compounded since March, 1876, the date of the transfer, shall have been paid.

PENNSYLVANIA.

LEBANON VALLEY SMELTING COMPANY.—The works of this company at Myerstown were seized by the constable on the 15th inst. Several years ago, indications of gold were found on South Mountain, and an extensive plant for gold mining was erected.

UTAH.

JUAB COUNTY.

CROWN POINT GOLD AND SILVER MINING COMPANY.—At a meeting recently held, the following officers were elected : John Beck, President ; William Bredemeyer, Vice-President ; Arthur Stayner, Secretary and Treasurer ; C. W. Stayner and B. Y. Hampton, Trustees. It was decided to sink, jointly with the Beck, Bullion & Champion Company, a shaft on the common end-line of the two properties to a depth of 200 feet on the vein.

WASHINGTON COUNTY—SILVER REEF.

CHRISTY.—The mill closed down on the 1st inst., and will remain idle until the 15th. While there is sufficient ore in the California and Maggie stopes to keep the mill running, the managers of the company think it advisable to refrain from crushing until the donkey hoisting-engine can be put in place in the new shaft, when both mines can be worked together.

WISCONSIN.

During the week ended October 2d, the shipments from the port of Ashland for the season, up to and including the date named, are as shown by the following table :

Name of mine.	Gross tons.
Ashland	1,189
Colby, Neepigon	2,575
Colby, north vein	18,430
Colby, south vein	24,653
Germania	3,998
Norrie	7,348
Total	58,193

BULLION PRODUCTION FOR 1885—SPECIAL OFFICIAL REPORTS.

MINES.	States.	Month of September.	Year from Jan. 1st, 1885.
		$	$
Adams, S. L.	Colo.	.....	241,103
Alice, G. S.	Mont.	.....	658,562
Belmont	Nev.	——	10,063
Bodie, G.	Cal.	.....	**17,907
Boston & Montana, G.	Mont.	.....	328,467
Christy, S	Utah	.....	170,279
Chrysolite, S	Colo.	.....	44,710
Colorado Central, S.	Colo.	25,004	184,620
Consolidated Bobtail, G.	Colo.	.....	41,228
Deadwood-Terra, G.	Dak.	34,894	328,783
Derbec Blue Gravel, G. S.	Cal.	.....	95,181
Essex, G. S.	N. S.	.....	6,474
Eureka Consolidated, S. L.	Nev.	.....	180,619
Father de Smet, G.	Dak.	.....	230,474
Freeland, G. S. C.	Colo.	.....	223,729
Grand Prize, S. G.	Nev.	24,810	223,873
Granite Mountain, S.	Mont.	.....	688,700
Hall-Anderson, G.	N. S.	.....	7,741
Head Center & Tranquillity	Ariz.	——	85,396
Hecla Consolidated, G. S. L. C.	Mont.	.....	*584,077
Helena, G. S. L. C.	Mont.	.....	473,584
Homestake, G.	Dak.	123,363	954,052
Hope, S.	Mont.	.....	107,446
Iron Silver, S. L.	Colo.	.....	382,606
Kentuck, S.	Nev.	——	3,562
Lexington, G. S.	Mont.	82,108	660,204
Montana, Limited, S. G.	Mont.	.....	573,317
Moulton, S. G.	Mont.	.....	310,792
Mount Diablo, S.	Nev.	.....	325,231
Navajo, S.	Nev.	——	82,894
New Hoover Hill, G. S.	N. C.	.....	52,319
New Pittsburg, S.	Colo.	5,000	14,594
North Belle Isle, S.	Nev.	——	2,118
Ontario, S.	Utah.	192,712	1,421,689
Oxford, G.	N. S.	2,522	14,697
Plymouth Consolidated, G.	Cal.	75,645	724,651
Rooks, G.	Vt.	.....	28,383
South Yuba, G.	Cal.	1,917	3,085
Standard Consolidated, G.	Cal.	15,496	136,918
Stormont, S.	Utah.	.....	109,204
Syndicate, G.	Cal.	.....	**62,327
Tombstone, G. S. L.	Ariz.	.....	403,875
Total		.....	11,198,924

G., gold ; S., silver ; L., lead ; C., copper. Silver valued by the different companies from $1@$1.29 per ounce ; gold, $20.67. *Not including value of lead and copper. † Royalty. ‡ Net. —— No shipments during month mentioned. ** Not official.

MARKETS.

NEW YORK, Friday Evening, Oct. 16.

Silver.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
Oct. 10	47¼	102¾	Oct. 14	47⅜	103
12	47¼	102¾	15	47⅛	103⅛
13	47¼	102¾	16	47 9-16	103¼

The silver market has advanced the past week on a higher London rate and an advance in sterling exchange here, and may be considered steady at the figures of the accompanying table.

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 2 per cent. During the week, the bank gained £81,206 bullion ; and the proportion of its reserve to its liabilities was raised from 33 to 34 9/16, against 35¼ per cent at this date last year. On the 15th inst., the bank lost £165,000 bullion on balance. The weekly statement of the Bank of France shows losses of 7,201,000 francs gold and 3,109,000 francs silver. At London, bar silver advanced ¼d. to 47¼d. an ounce.

Copper.—The copper market is without life, and here may be quoted as Lake 11c. ; best Arizona brands, 10¼c. ; Baltimore and Orford, 10⅛c.

The cable tells us that Chili Bars are quoted at the close of business to-day £39 10s., and for several days have stood at £39 7s. 6d. It is said that the London speculator, Strausse, sold a large quantity of Chili Bars at £39 10s., seller 60 days, or, according to some reports, to end of January, with option of delivering double the quantity. At the time this sale was made, Chili was quoted £40 10s. The same gentleman was the prominent "bull" who organized the Chili Bar pool some years ago at £64, and it is said lost a large amount of money by his miscalculation ; and he was the moving spirit in the recent advance in tin in London, which is supposed to be far from the realization of his expectations. The effect of his "bear" movement in copper is not therefore deemed as important as if he had in the past been a better prophet. Best Selected, £45.

We give elsewhere, in Mr. Douglas's letter, a valuable summary of the copper outlook, and in the English statistical reports, the stocks, etc., which are now, as compared with the consumptive demand, smaller than

they were when copper was selling at nearly double the present price. The stocks in England are now equal to less than six months' consumption ; here, the stocks would not supply the market for a single month.

There is a rumor that the French syndicate that has been endeavoring to float the Lower California copper mines at 12,000,000 francs—say $2,350,000—has failed to float the enterprise. The property is said to have cost the syndicate, of which M. de la Bouglise is one of the engineer members, not more than $400,000, if as much. And it is also said that a Mr. Lezinsky has a claim for one half the property not recognized in the sale.

The Old Dominion is running only one furnace, and all its product is taken in this country and is engaged for up to the end of the year. The Anaconda has, we understand, 26 furnaces running to fill existing contracts.

JAMES LEWIS & SON'S, OF LIVERPOOL, MONTHLY REPORT ON ORES AND METALS, OCTOBER 1ST.

Chili Bars were sold within half a crown of £40 a ton for cash on the 25th ult., and a speculative sale for delivery on the 31st January, 1886, with the option to double the quantity, at £39 10s. a ton, has since been made.

The market has been adversely affected by the decline in silver to 47¼d. an ounce, and the consequent withdrawal of orders for India, by the large arrivals here and in France, causing an increase in the stocks of 1755 tons, and by the negotiations pending for the renewal of a contract for a large quantity of American matte.

Early in the month, sympathizing with the advance in iron, Chili Bars improved 10s. a ton, but have since steadily declined from £42 17s. 6d. for cash on the 8th ult., to £40 2s. 6d. on the 25th. This low figure induced considerable buying, but we close with sellers of cash Bars at £40 10s., and of three months, at £41 2s. 6d. a ton.

From 4000 to 5000 tons (2000 pounds) of Lake Superior ingots have been sold to American manufacturers, for delivery during the remaining months of this year, at 11 cents a pound, equal to £52 12s. 6d. per English ton, less 2½ per cent discount, or about £7 above the present value of English Best Selected here.

It is reported that the large Mansfeld mine in Germany, which produces about 12,500 tons of copper, has passed its dividend.

It will be seen from our statistics that the excessive import of copper into England and France during the past nine months has been almost entirely from America and Japan. The import from Chili has been 3973 tons less than last year, that from Spain 502 tons less, and from other countries 686 tons more. From the United States, the increase has been 10,130 tons, and from Japan into London 2450 tons, the import of Australian there showing an increase of 150 tons, but a decrease of 273 tons into Liverpool and Swansea.

Quotations to-day are : Chili Bars of G. O. B.'s, £40 10s. for sharp cash, and £41 2s. 6d. for three months' prompt. English Best Selected in Birmingham and Lota ingots here, £45 10s. a ton. Ore of 25 per cent, from 7s. 6d. to 7s. 9d., and regulus or matte, 7s. 9d. to 8s. per unit.

Chili exports to 30th September are (tons fine) :

	1881.	1882.	1883.	1884.	1885.
Exported to July 31st	21,460	24,503	23,056	24,671	21,517
Loading on July 31st	1,544	2,531	3,924	3,532	5,864
Chartered to September 30th	7,166	6,770	6,689	5,805	5,018
	30,170	33,804	33,669	34,008	32,399

Stocks of Chili produce are :

	Bars.	Ingots.	Regulus.	Ore.	Barilla.
Liverpool	26,279	120	1,409	....	....
Swansea	5,138	....	2,704	....	....
	31,417	120	4,113	....	....
		Oct. 1, 1885.	Sept. 1, 1885.		Oct. 1, 1884.
Equal to		33,387	32,323		22,516

Stocks of other than Chili produce are (tons fine) :

Liverpool and Swansea	5,454	5,219	4,775
London	5,605	5,506	3,078
Havre (Chili, etc)	2,083	1,726	1,294

Afloat, as advised by mail and cable to date (tons fine) :

From Chili	9,764	11,266	9,153
Australia	1,300	1,350	1.200
Total visible supply	57,593	57.390	42,016
Quotations — Bars, per ton	£40 10s 0d	£42 5s 0d	£54 7s 6d
Quotations — Ore, per unit	7s 9d	8s 3d	10s 3d
	Oct. 1, 1883.	Oct. 1, 1882.	Oct. 1, 1881.
Equal to	27,806	22,560	28,946

Stocks of other than Chili produce are (tons fine) :

Liverpool and Swansea	4,435	1,936	883
London	3,900	7,134	8,646
Havre (Chili, etc)	2,292	2,965	5,821

Afloat, as advised by mail and cable to date (tons fine) :

From Chili	11,534	12,134	10,127
Australia	900	1,025	2,200
Total visible supply	50,867	47,754	56,625
Quotations—Bars, per ton	£63 5s 0d	£71 15s 0d	£62 15s 0d
Quotations — Ore per unit	12s 4½d	14s 3d	12s 9d

Imports of copper (exclusive of pyrites) from 1st January to date are (tons fine) :

	1882.		1883.	
Chili into Liverpool and Swansea	20,150		20,161	
Other countries into Liverpool and Swansea	17,829		27,588	
Other countries into London	....		....	
Australia into London	8,891		7,845	
Japan into London	....		....	
	....	46,870	....	55,594
Chili into France	10,304		12,230	
America into France	....		....	
Other countries into France	1,284		3,585	
	....	11,588	....	15,815
		58,458		71,409
Deliveries—ditto—in England and France		62,606		68,103

Imports of copper (exclusive of pyrites) from 1st January to date are (tons fine) :

	1884.		1885.	
Chili into Liverpool and Swansea	22,628		22,246	
Other countries into Liverpool and Swansea	32,472		37,890	
Other countries into London	....		94	
Australia into London	7,636		7,693	
Japan into London	....		2,450	
	....	62,736	....	70,373
Chili into France	8,760		5,169	
America into France	3,075		7,215	
Other countries into France	317		800	
	....	12,152	....	13,184
		74,888		83,557
Deliveries—ditto—in England and France		83,068		74,752

Imports of other than Chili copper into Liverpool and Swansea during the first nine months of the following year (tons fine) :

	1882.	1883	1884.	1885.
From United States	521	6,006	12,752	18,742
Canada	244	353	266	..
Mexico	202	460	254	365
Peru	741	374	323	158
River Plate	196	302	105	174
New Quebrada	2,448	3,163	2,653	2,833
Newfoundland	995	1,066	224	257
Spain	327	1,435	2,044	2,597
" (precipitate)	6,478	8,531	7,901	6,846
Portugal	....	110	117	478
Italy	1,072	691	666	572
Norway	304	178	235	....
Cape of Good Hope	3,624	3,939	4,277	4,592
Australia	112	160	419	146
Sundries	565	820	236	130
	17,829	27,588	32,472	37,890

Lead.—There has been a break in the lead market, and prices, even of the C. C., have gone off to 4·15 cents for Common, with the market weak. We have to report sales of about 1600 or 1700 tons during the week. Of this, about 500 tons of Richmond lead at 4⅛c. here, and 1000 tons from two Western works, supposed to be the Pennsylvania Lead Company, and the Kansas City Company, for November and December delivery, at 4·15c. Some smaller sales were made at 4·15c., which may be considered the market to-day. As reported to us by wire from St. Louis and Chicago, these markets appear also to have gone off. Soft Spanish lead in London is quoted to-day at £11 5s.

Messrs. Everett & Post, of Chicago, yesterday telegraphed to us the following :

The market remains about the same—if any thing, a shade weaker. Sales early in the week, 300 tons Corroding, at 4·17½c. Latterly, market quiet at 4·12½c.; freer offerings, however. The stocks in the hands of holders are limited. Freights firm.

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

Market very dull and unsettled, and accurate quotations can not be given. Buyers, expecting a decline, are holding off, and buy only for immediate wants. Buyers are as scarce as hens' teeth. For round lots and future deliveries, we may quote both Hard and Soft lead nominally 4·05c., 4·07½c.

Tin.—This market is weak, and may be quoted 20¼@22½c. for spot and 19½c. January.

In London, the price at close of business to-day was £91 7s. 6d. for spot and £90 12s. 6d. for three months We publish herewith Messrs. C. Levin & Co.'s London statistics of tin.

Tin Plates are somewhat higher, and may be quoted $5.12½@$5¼ for Charcoal bright, $4.50@$4.75 for Ternes and Coke tins.

C. LEVIN & CO.'S, LONDON, MONTHLY METAL CIRCULAR, OCTOBER 2D.

There is as yet very little to be seen of the rapid revival in trade so confidently predicted a fortnight ago.

Tin has never been more uninteresting to operators than during the last month. The enormous and unjustified advance that has taken place since the beginning of April, and the heavy losses that have been incurred since then, have made speculators very cautious, and they abstain totally from entering into any negotiations whatever, as the article can be handled at present just as it suits the interests of merchants.

Home consumption is poor in the extreme, and there exists hardly any demand for English tin.

Comparing the statistics with last year, it will be seen that stocks of Straits and Australian spot, landed and afloat, show an increase of nearly 2000 tons, and the price is £12 higher.

Deliveries—January to September.	1885.	1884.
English	11,551	13,086
Holland	4,988	5,020
	16,539	18,106

Or a decrease of 1597 tons.

Shipments—January to September.	1885.	1884.
Straits	12,900	11,700
Australia	6,075	6,096
	18,975	17,796

Or an increase of 1100 tons.

Price to-day, £90 10s.

Holland has been startled during the month by an official announcement that the stock of Banca was 600 tons less and Billiton 80 tons. In good times, such news would have had a strong effect on prices, but now the market remains quite indifferent.

Business in Holland as well as in the United Kingdom is very much restricted, and no disposition prevails to strike out in any direction.

The Dutch trading sale of Banca took place on the 30th ult., and realized in average 55½ florins, equal to £92 10s., at which the market closes with sellers.

In *résumé*, the present price of tin is merely artificial, and the movements should be very carefully watched. Outside or general speculation was never so poor.

	Aug. 31, 1885.	Sept. 30, 1885.	Sept. 30, 1884.	Sept. 30, 1883.
Straits and Australian, spot and landing	6,707	6.621	5,490	4,550
Straits afloat	1,680	2,190	1,360	525
Australian afloat	1,195	1,310	1,400	1,650
	9,582	10,121	8,250	6,725
Banca on warrant	1,120	9.75	1,420	1,320
Billiton, spot	850	770	1,450	2,050
" afloat	919	590	785	750
	12,471	12,456	11,906	10,845
Price	£91 5s	£91 15s	£79 15s	£95 0s.
Stocks of tin in American ports (including quantity afloat)	1,863	1,940	....	....
Deliveries during the month in				
London	927	1,101	1,375	1,143
Holland	654	500	464	741
Shipments during the month from				
Straits to London	950	1,700	975	375
Australia to London	750	650	800	950
London and Holland to America	710	860	365	....
Straits to America	300	150	325	900
Australia to America	150	....	50	....

	—During twelve months— ended Sept. 30, 1885.	Sept. 30, 1884.
Supplies.		
Shipments from		
Straits to London	15,410	13,250
Australia to London	7,985	8,650
Straits to America	2,330	3,814
Australia to America	600	550
Consumption.		
Deliveries of Tin in		
London	16,155	17,219
London and Holland	23,510	24,263
London and Holland, and United States	33,510	35,662

Tin plates remain steady, but without any material alteration in price. 1C Cokes, from 14s. to 14s. 6d.

Spelter and Zinc.—Domestic spelter is firm at 4·45@4·50c., and Foreign 5c. In London, Silesian Spelter is quoted by cable to the Metal Exchange, £14 5s.

Sheet-Zinc may be quoted at 5⅞@6c. for Domestic.

Antimony—Remains unchanged at 9c. for Hal-

lett's, and 9¾c. Cookson's. In London to-day, Hallett's was quoted £35.

Aluminium.—We quote, $1 per ounce.

Bismuth—$2@$2.25 per pound.

Nickel has advanced to 75 cents per pound for Domestic.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 16.

American Pig.—The pig-iron market, like that of most of our other metals, is quieter than it has been. Prices are unchanged: $18 for No. 1 X; $16 for No. 2 X; and $15 for Forge. Iron Certificates at the Metal Exchange are quoted $15¼@$15¾, based on No. 2.

Scotch Pig.—About 800 tons of Scotch iron have come in during the week. Prices are unchanged and the demand quiet. We quote: Coltness, $19.25@$19.50; Summerlee, $19; Eglinton, $18. In Glasgow: Coltness, 49s.; Summerlee, 47s. 6d.; Eglinton at Ardrossan, 41s. 9d.

Bessemer Pig.—We may quote $19, or a little higher than last week, the Cornwall Company having advanced its price $1 a ton. Foreign Bessemer has recently been selling freely in Philadelphia. (See our Philadelphia report.)

Spiegel.—20 per cent, $25.50@$26; 30 per cent, $31@$32.

Nails.—There has been a considerable advance in nails, which are now quoted at $2.40@$2.50 a keg, and there is a rumor of a demand for an advance in wages at Eastern mills, on a threat to strike in ten days if not acceded to. The market has a very light stock.

Steel Rails.—The prices continue: $30 at Eastern mills, $31 Pittsburg, and $32 Chicago, for heavy sections; but for prompt deliveries or small lots, a little more is asked, and light sections are quoted all the way from $33 for 35 pounds to $39 for 16 to 20 pounds. There seems to be an impression that $35 will be reached early in the next year, or perhaps before that.

Old Rails.—These may be quoted at $17@$18, which is cheap, and a price likely to advance before pig-iron does.

Merchant Iron may be quoted at 1·50c. Common, 1·75@1·85c. Refined.

Structural Iron—2@2·10c.; Refined, 2¼c.

Plate Iron.—Angles, 1·9@2c. Tees, 2·25c.

Beams and Channels—3c.

Merchant Steel.—American Tool Steel, 8@10c. Special qualities, 12@15c. Crucible Machinery, 4½@5½c. Bessemer Machinery, 2@2½c.

Philadelphia. Oct. 16.

[From our Special Correspondent.]

Fewer large transactions in crude and finished iron are to be reported this week than in any previous week for perhaps six. The reason is, that the heavy buyers have about supplied themselves with all the material they need to at least the first of December, and some for later. Prices are apparently very firm this week, but it is quite probable that, if buyers of large lots were to make a square offer, they would find the market not quite so firm as it looks. This has particular reference to Forge Irons, which are held firmly at $15.25@$15.75, according to brand and make. Some of the so-called inferior irons would, perhaps, answer the purpose as well as better brands; but not having the reputation, they are obliged to go a begging for buyers. Of late, there is little attention given to inferior irons, by manufacturers, because of the lower prices at which good material could be had. There are offers in the market to-day for considerable supplies of Forge on a basis of about $15, which may be and likely will be accepted this week, and if so, it will impart considerable activity to the crude iron trade. Foundries are still selling in a moderate way at $16 up to $18.50 for Nos. 2 and 1.

Foreign Irons.—Several large lots of Bessemer have been sold, and negotiations are in hand for additional sales, which, if closed, will bring the transactions recently closed and under way up to 20,000 tons.

Muck-Bars.—There seems to be a probability of a slight advance in muck-bars of about 50 cents a ton, and several small lots have been contracted for within a day or two, but there are not sufficient margins in the way of finished iron to expect a permanent advance. Quotations range from $27@$28.

Merchant Iron.—Common iron is selling at $1.50; Medium, $1.60; Refined, $1.70@$1.80. Small lots are mostly selling. Offers are made for large lots at one tenth below asking price. A few orders for common iron have been placed in interior mills, and some of the mills throughout the State are reported to have closed for good contracts, but prices are not at hand. There seems to be weakness in the market rather than strength.

Nails.—Nails are quoted at $2.40@$2.50, with an upward tendency that may any day lead to an advance, especially in small lots. The makers have, of course, as much business as they can do, and anticipate a heavier demand in consequence of the Western iron-makers' decision on Wednesday. Builders are buying with more activity, and store-keepers report a heavier demand for country delivery.

Slabs.—Slabs for nails are quoted at $30@$32.

Sheet-Iron.—There is no change in the situation. Prices are very firm and demand active for all kinds, and the outlook encouraging. The consumption during the winter promises to be very heavy. Stocks are low.

Merchant Steel.—All of the makers of merchant steel here report a good demand, without any change in prices.

Plate-Iron.—Plate-iron is selling at 2@2·10c. Shell and flange are in better demand than for two or three weeks; but after all, there is not enough business to put prices where manufacturers say they ought to be. The business is of a rather hand-to-mouth character this week; but we have had a few good weeks since September 1st, and therefore less cutting is to be expected during the probable lull of the next two or three weeks. Skelp iron is 1·80@1·85c.

Structural Iron.—The makers of bridge iron have been doing a good business in a small way. The aggregate of business is good, but there is no one order of much moment. The agents and manufacturers are about closing for small orders; but as deliveries will be extended for three months, there will be nothing to boast of. Angles are 1·90@2c.; Beams and Channels, 3c. The discounts are firmly adhered to, but less business has been done this week than usual.

Steel Rails.—Steel rails are quoted at $30@$31, with a reported upward tendency in small lots for early delivery. Large lots are exceptional, although the business for the week is reported at 20,000 tons. These figures are not reliable, and probably do not represent all the business that has been transacted. Makers are quite firm in their quotations, and are confident that buyers will be obliged to do business at their terms sooner or later. A good many orders for street rails are filling, and there are several inquiries in for light sections. Lumber roads have been buying a good many rails, and there are inquiries in for moderate-sized lots from that quarter.

Old Rails.—Small lots of old rails sell as high as $18 this week. There is a scarcity of supply, and no immediate prospect of buyers finding what they want. The lowest quotations run all the way from $17@$18.

Scrap.—Best scrap is selling in a moderate way at $18; Ordinary Scrap, $17; Steel Scrap, $10@$12. Supplies are not hastened forward, but buyers can obtain concessions on large lots, which will be delivered as wanted. Yard-men are not disposed to carry very large stocks, on account of the uncertain course of the market.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Oct. 16.

Statistics.

Production Anthracite Coal for week ended October 10th, and year from January 1st:

TONS OF 2240 LBS.	1885. Week.	1885. Year.	1884. Week.	1884. Year.
P. & Read. RR. Cc..	274,680	8,526,063	318,007	8,372,526
L. V. RR. Co.....	147,093	4,417,661	180,098	4,521,475
D., L. & W. RR. Co.	139,517	3,621,805	126,933	3,850,562
D. & H. Canal Co..	95,756	2,844,762	88,815	2,905,377
Penna. RR.:				
N. & West Br. RR.	23,317	904,663	12,196	638,300
S. H. & W. B. RR.	5,144	172,902	.....	134,768
P. & N. Y. RR....	13,024	330,706	18,515	324,633
Penna. Coal Co	39,366	1,010,650	35,944	983,104
Penna. Canal Co....	15,227	326,934	15,444	335,948
Shamokin Div., N. C. RR	24,107	755,196	26,283	796,051
Lykens Valley.....	*10,500	389,804	11,851	425,483
Total...	787,731	23,301,146	834,086	23,288,227
Increase..	.....	12,919	.....	.....
Decrease.	46,355	.....	.....	.....

* Estimated.

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:

1880.....	17,769,941	1882.....	22,365,107
1881.....	21,704,951	1883.....	24,431,039

Production Bituminous Coal for week ended October 10th, and year from January 1st:
Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1885. Week.	1885. Year.	1884. Week.	1884. Year.
Philadelphia & Erie RR....	14	21,245	.....	.....
*Cumberland Region, Md.....	53,516	2,133,190	72,854	2,213,526
*Barclay Region, Pa.				
Barclay RR.....	4,512	184,059	5,096	233,125
*Broad Top Region, Pa.				
Huntington & Broad Top RR.....	3,669	119,068	4,920	153,037
East Broad Top....	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe.....	3,536	111,594	4,070	140,987
Karthaus (Keating)	3,263	96,107	1,793	39,244
Tyrone & Clearfield	51,696	2,228,620	68,743	2,434,244
Alleghany Region, Pa				
Gallitzin & Mountain....	9,682	401,743	12,302	305,109
Total	129,888	5,295,626	169,778	5,519,272

* Tons of 2240 lbs.

WESTERN SHIPMENTS.†

Pittsburg Region, Pa.				
West Penn RR.....	4,211	172,365	5,936	216,981
SouthwestPenn. RR.	2,170	77,062	1,926	98,533
Pennsylvania RR ..	4,158	166,035	5,885	214,755
Westmoreland Region, Pa.				
Pennsylvania RR...	27,457	830,967	23,130	1,013,597
Monongahela Region, Pa.				
Pennsylvania RR...	5,464	210,674	3,362	119,759
Total.....	43,460	1,457,073	40,239	1,663,625
Grand total	173,348	6,752,697	210,017	7,182,897

†Considerable gas-coal shipped East, of which no division is made in report.

Chesapeake & Ohio Railroad Company's report of total output and distribution of coal and coke. Received from mines on line of Chesapeake & Ohio Railroad (including mines on Lexington Division) for the week ended October 7th and year from January 1st. Tons of 2000 pounds:

Kind of coal.	Week. 1885.	Week. 1884.	Year. 1885.	Year. 1884.
Cannel.....	1,164	665	21,150	17,143
Gas....	4,119	4,225	256,337	236,793
Splint and block	7,316	3,581	132,732	81,702
New River, etc.	11,499	6,262	440,039	310,451
Coke....	2,586	1,975	91,817	53,777
Total.....	26,684	16,708	942,075	699,866
Increase.....	9,976	.....	242,209	.....

Production of Coke on line of Pennsylvania RR. for week ended October 10th, and year from January 1st:
Tons of 2000 pounds.

	1885. Week.	1885. Year.	1884. Week.	1884. Year.
Alleghany Region.	3,782	141,575	2,911	105,173
West Penn. RR....	1,646	39,059	.....	24,865
Southwest Penn. RR	29,741	1,391,320	30,180	1,684,732
Penn. & W. Region	4,876	181,483	3,173	150,203
Monongahela	1,538	73,129	1,078	57,687
Pittsburg Region.	.....	.. ...	.....	136
Snow Shoe.....	950	15,022	458	17,781
Total....	42,533	1,841,588	37,800	2,040,577

Anthracite.

Egg coal is very scarce, stove is scarce, and there are indications that it will soon be in such short supply that there will be many who will be disappointed in getting what they want. Broken coal is by no means in liberal supply. Chestnut coal, as we stated last week would soon be the case, is pretty closely sold up, and is likely to stiffen considerably. In fact, there are but two sizes that are at all troublesome, namely, pea and buckwheat coal.

The Delaware & Hudson Canal Company has advanced its prices to contractors as follows: Grate, $3.25; Egg, $3.35; Stove, $4; and Chestnut, $3.60 per gross ton. It is stated that in markets up the river there will be no difficulty in getting these prices. Last week, the Reading Company was selling Chestnut coal at $3 per ton, net f. o. b. It is now asking $3.35. This is due to its having made large sales during the week, and feeling confident of moving its further production at the new price. It asks $3.95 net for Stove, and does not care for orders at that price. It asks $3.25 for free-burning Broken and Egg. At the end of last week, the company's stock at Port Richmond was but 94,000 tons, a reduction of 16,000 tons for the week. Chestnut coal was reduced in quantity about 2000 tons. The reports at the end of this week and the end of next week, however, will show a great reduction of this size. The company claims to have very pressing demands for a large quantity of this coal in the West. It is stated that it has orders for immediate delivery for about 600,000 tons of all kinds of coal, and that vessels are intercepted at the Capes to make charter contracts with them. In fact, an officer of the company informed us that the company never had such a business.

Delaware, Lackawanna & Western is said to be short of some sizes, especially stove; and to be asking quite as much as the Delaware & Hudson on the average. Individual shippers and the smaller companies are very stiff in their prices, and there is, upon the whole, a happier condition of affairs than has ruled for many months; in fact, the trade is taking care of

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	Highest and Lowest Prices per Share at which Sales were Made.												Sales.
	Oct. 10.		Oct. 12.		Oct. 13.		Oct. 14.		Oct. 15.		Oct. 16.		
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon.					.15		.05						2,000
Amie Con., Co.	.05												
Argenta													
Bassick, Co.													
Belle Isle, Ne.													
Bodie Cons., Ca.			1.65		2.10	1.75	2.35	2.15	2.85	2.70	2.60	2.35	6,270
Bulwer, Ca.	.33		.33	.31	.32		.28	.36	.50	.43	.40	.37	12,700
California, Ne.													
Cal. & Hecla, Mich.													
Castle Creek													
Challar													
Chrysolite, Co.					1.20								100
Colorado Central			1.45		1.45								1,100
Cons. Cal. & Va., Ne.	1 30	1.25	1.10				1.30	1.25	1 40		1 25		2,614
Crown Point													
Dunkin, Co.													
Eureka Cons., Ne.									3.00				200
Father de Smet, Dk.	4.90	4.80	4 90		5.00								425
Franklin													
Gold Stripe, Ca.													
Gould & Curry, Ne.													
Grand Prize, Ne.											.35	.25	700
Green Mountain, Ca.													
Hale & Norcross, Ne.	4 30		4 10										400
Hall-Anderson, N. S.													
Homestake, Dk.													
Horn-Silver, Ut.	2 20		2.25	2.15			2.20	2.10	2.15		2.10		3,100
Independence, Ne.													
Iron Silver, Co.							1.25		1.30				300
Leadville C., Co.			.31	.30									200
Little Chief, Co.							.33						200
Little Pittsburg, Co.			.22				.25						200
Martin White, Ne.													
Moulton									1.25				100
Navajo, Ne.			.70		.60				.65				520
North Belle Isle, Ne.													
Ontario, Ut.	25.50				24.75						25.50		325
Ophir													
Osceola													
Plymouth							18.75				18.75		80
Quicksilver Pref., Ca.	29.50	29.00	30.75	29 38	30.25		29.75				29.50	29.00	3,400
" Com., Ca.	7.25	7.00	7.50										300
Quincy													
Robinson Cons., Co.	.56												700
Savage, Ne.	1.55						1.60						930
Sierra Nevada, Ne.	.70		.80	.75									1,000
Silver King, Ar.	5.88		5.50								6.00		510
Spring Valley, Ca.													
Standard, Ca.					1.10	1.05	1.15	1.05	1.25	1.20	1.25	1.20	2,100
Stormont, Ut.	.09												100
Tip Top, Ar.													
Yellow Jacket	2.00		2.00				2.00						400

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	Highest and Lowest Prices per Share at which Sales were Made.												Sales.
	Oct. 10.		Oct. 12.		Oct. 13.		Oct. 14.		Oct. 15.		Oct. 16.		
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allouez													
Alta													
American Flag													
Barcelona, G.					.10			.11		.11		.10	1,700
Bechtel Con., G.													
Belvidere													
Belcher													
Best & B'lcher, G. & S.	1 30		1.10							1 40			400
Big Pittsburg, S. L.													
Bowman Silver													
Bull-Domingo, S.L.													
Cal., B. H., G.	3.00							2.95	2.75	2.75		2.60	800
Central Ariz'na, S.								.15				.15	1,100
Challar													
Cons. Imperial													
Con. Pacific													
Cusi													
Decatur													
Durango, G.													
Eastern Oregon													
Goodshaw, G.													
Harlem M. & M. Co.													
Harshaw													
Kossuth													
Lacrosse, G.	.10												100
Mariposa Pref., G.													
" Com., G.													
Mexican, G. & S.													
Mono							2.00						500
New Pittsburg													
Noonday													
North Standard, G.													
N. Horn-Silv'r, S. L.													
Ori'nt'l & Miller, S.					.10								500
Potosi													
Rappahannock G.					.05		.06	.05		.05			3,000
Red Elephant, S. & L.					.03			.03			.03		900
Ridge													
Silver Cliff, S.													
Sonora Con.													
South Bodie, G.													
South Bulwer, G.													
South Hite													
South Pacific													
State Line, 1 & 4, S.													
" Nos. 2 & 3, S.													
Sutro Tunnel	.16		.16	.15	.16		.16		.17	.16	.16		7,700
Tamarack													
Tioga													
Unadilla, S.													
Union Cons., G. & S.								.64	.63				1,100
Utah													

Dividend shares sold, 40,944. Non-dividend shares sold, 17,800.

OUR USUAL TABLE GIVING CAPITAL, ASSESSMENTS, AND DIVIDENDS OF ABOUT 250 MINES IS OMITTED THIS WEEK.

itself, and no one cares to ask disagreeable questions about the future.

The Pennsylvania Coal Company, it is said, is trying to purchase chestnut coal to supply its orders.

The firm name of R. H. Williams & Co. has been changed to that of Williams & Peters. There has not been, however, any change whatever in the membership and conditions of the copartnership.

Yesterday's Philadelphia *Record* says:

The coal blockade at Belmont continues. There were 900 loaded cars at that point yesterday awaiting the pleasure of the Pennsylvania Railroad Company to haul them to firms on Washington avenue to whom they are consigned.

This must be embarrassing to the Reading Company, which needs its cars to such an extent at present.

Bituminous.

There is a little better transient business. Prices are no higher. Cars are still very scarce, and vessel rates have advanced. To attempt to say more on this subject would be to waste valuable space.

Philadelphia. Oct. 15.

[From our Special Correspondent.]

Every thing is lovely, as far as the demand for coal is concerned, and any thing but pleasant as to filling the orders. After a very dull summer, when consumers held back, the approach of winter makes the hurry in all directions very urgent, and there is not coal enough to satisfy every body at the same time. The scarcity of egg coal is particularly distressing, and is something unusual. Vessels are not plenty, and the rate of freight is stiffening daily. New York took the lead, and for several day freights to the East remained as low here as in New York; but they are now creeping up, and $1 10@$1.15 is freely paid to Boston, with the prospect of $1.25 being reached before many days.

Buffalo. Oct. 15.

[From our Special Correspondent.]

The editorial and other columns of the ENGINEERING AND MINING JOURNAL are so richly laden with general news relative to the anthracite and bituminous coal trade that your correspondent has but a barren field to labor in.

The great trouble with our business is the want of transportation facilities. Orders are plentiful, and cars are few. One dealer assured me that his orders for the past three weeks exceeded those of the corresponding period in 1884 by nearly 20,000 tons. Our merchants and shippers say that there is now quite a boom in the coal trade. The West is hungry for fuel. The Western dealers talked of and expected lower prices that were sure to come before winter. They have missed their calculations, and are now making urgent demands for coal to be delivered immediately, especially for points not accessible by the water routes. There is no doubt that the West is very, *very* short of the supply of anthracite necessary for consumption in the near future, irrespective of what will have to be supplied during the winter months after the close of navigation; and the trouble is, that the miners and shippers are unable to get any thing like enough cars to bring the coal to Buffalo from the mines, to say nothing of sending of it West by rail to points not reached by water. It would not be a surprise to me to hear that prices advanced in a few days, and then look out for mutterings and grumblings.

Lake freights are steady; the scarcity of coal prevents the anticipated advance in freights. A large fleet is expected in a day or two; therefore the prospects for increased rates are not encouraging to vessel-owners. The shipments of coal by lake from Buffalo from October 8th to 14th, both days inclusive, were 46,880 tons, as follows: 21,130 to Chicago, 15,210 to Milwaukee, 5100 to Duluth, 2680 to Toledo, 1150 to Superior City, 800 to East Saginaw, 750 to Detroit, and 60 to Windsor.

The freight engagements were at the following rates: 50c. to Chicago and Milwaukee; 35c. to Duluth and Superior City; 30c. to Toledo; 25c. to Walkerville, Saginaw, and Detroit; closing with light stocks and firm feeling.

The coal engagements by canal for the past week were as follows: 2 loads to Syracuse, 48c. gross ton, free in and out; 2 loads to Lansingburg, 80c. gross ton, free in and out; one load to Lockport, 31c. net ton, free in and out. The nominal rate to Albany and West Troy is 95c. net ton, captain to pay loading and unloading; and $1.15 net ton to New York, captain to pay loading and unloading.

From statistics that I have collected, it appears that, from the opening of navigation to October 1st, 1885, there were shipped by lake from Buffalo to Chicago about 460,000 tons of coal; to Duluth, 92,000; to Toledo, 36,000; to Sandusky, 12,000; to Saginaw, 5000; to Marquette, 14,000; to Detroit, 20,000; to Manitowoc, 4000; to Racine, 19,000; to Sheboygan, 5000; to Milwaukee, 260,000; to Green Bay, 27,000; to Washburn, 8000; to Superior City, 48,000; to Hancock, 4500; to Fort William, 5000; to Portage, 2000; to Kenosha, 2000; to Escanaba, 2000; to Ashland, 1500; to Bay City, 1000; to Depere, 1000; and to 16 other points, quantities varying from 120 to 1450 tons.

Mr. Eric L. Hedstrom, the President of the Merchants' Exchange, has returned from his long business visit to Chicago. He was warmly greeted by the members.

A well-known oil operator is boring for gas on the grounds attached to his residence here. He believes that gas can be obtained in sufficient quantity for his domestic wants and for illuminating purposes at least. Three miles from our city and county hall, on the outskirts of the city limits at Getzville, a natural gas well has been "wasting its sweetness on the desert air" for many years, and it has never been deemed profitable to utilize it. Twenty miles from here, at Port Colborne, Canada, the entrance to the Welland Canal from Lake Erie, natural gas has been struck in sufficient quantity to light the public lamps. At several other points within a radius of from ten to twenty miles of Buffalo, boring for gas is progressing, and the results of the experiments are awaited with much interest.

It is asserted that the Lehigh Valley Coal Company intends to ship the greater part of its soft coal from the Snow Shoe region to our city, and the remainder, of course, to Eastern points. There is no doubt that more anthracite coal will come over this line to Buffalo this winter than last.

Boston. Oct. 14.

[From our Special Correspondent.]

The wholesale market for anthracite coal is dull. Most of the business is done on old orders at old prices that were made before the advance was put on. So far as we learn, the companies are holding firmly to the new prices for the little trade that has been had lately. The exertions of the market are chiefly devoted to securing prompt deliveries. Hence this anxiety to ship, together with the approach of rougher weather, makes freights firmer. The situation as to stocks of coal in the market remains without much change. There is still a scarcity of egg coal, and the supply of broken is not sufficient for the demand. Stove, nut, and pea continue fairly plenty. The Philadelphia & Reading office here is very busy filling orders. It has been

working nominally on the circular of June 1st, but has now issued a new circular. The most noteworthy changes made are the reduction in Lykens Valley of 25 cents a ton on Broken, 25 cents on Egg and Stove, and an even dollar a ton on Chestnut. The explanation given of these reductions is, that the difference between White Ash and Lykens Valley coals has been too great. The demand for Lykens Valley is very good. The new f. o. b. prices are: Broken, $4.40; Egg, $5.15; Stove, $5.15; Chestnut, $4.15. The new circular also makes a general reduction on Chestnut coal of 25 cents, and a general reduction on Pea of 20 cents.

There is no movement in bituminous coal worth reporting. Prices continue at $3.15@$3.35 delivered.

There is a firmer feeling in freights. There are fewer ice cargoes to be had as return freight, and this causes more vessels to be laid up. There is also the increased demand for coal charters noted above.

We quote:

New York, 95c.@$1.05; Philadelphia, $1@$1.10; Baltimore, $1.15@$1.20; Newport News, $1.10@$1.15; Richmond, $1.20@$1.25; Cape Breton, $1.50; Bay of Fundy, $1.35.

There is an active retail movement, and dealer have all they can do to fill orders. Prices are steady. Dealers have no coal on hand bought at present ruling prices. We quote:

White ash, furnace and egg	$4.75@$5.00
" " stove and nut	5.25@ 5.50
Shamokin, egg	6.00
" stove	6.25
Lorberry, egg and stove	6.50@ 7.00
Franklin, egg and stove	7.25@ 7.75
Lehigh, furnace, egg, and stove	5.25@ 5.50
" nut	5.50@ 5.75

We quote wharf prices as follows: Stove, $4.50@$4.75; Broken and Egg, $4@$4.50.

FINANCIAL.

NEW YORK, Friday Evening, Oct. 16.

The mining market has developed no interesting features, and the situation remains practically the same as last week, with firm prices. The total transactions were 58,744 shares, showing a decrease of 831 shares as compared with those of the preceding week.

Considerable activity was shown in Bodie Consolidated, and sales summed up 6270 shares. The price, which last week closed at $1.55, opened this week at $1.65, and during the week went as high as $2.85, closing at $2.35. Good reports have been received from the mines of the Bulwer Consolidated, and in consequence the price has advanced from 31@50c., closing at 37c.; the business has been very large, the sales amounting to over 12,700 shares. Standard has been influenced by the interest shown in the above stocks, and also showed an advance and larger business; it ranged from $1.05@$1.25. Mono, in which only occasional sales are made, sold at $2. Quicksilver Preferred and Common have again been features in the market; the former continues its upward tendency, and sold at from $29@$30.75; the latter has remained at from $7@$7.50. Plymouth Consolidated is quoted at $18.75.

The managers of the Colorado Central are keeping a large cash balance in bank, and the last financial statement shows that on 10th inst., after paying the dividend, they had to their credit $69,674.39. This movement is a wise one, and should be followed more extensively by many other mining companies. The stock is firm, and some 1100 shares were sold at $1.45. Iron Silver sold at $1.25@$1.30. Chrysolite, at $1.20. Leadville, at from 31@30c. Little Chief, at 33c. Little Pittsburg, at from 22@25c. Amie, at 5c. Robinson, at 56c.

The Homestake Mining Company has increased its dividends from 35 to 40 cents. The total amount paid to date is $2,968,750. No transactions were had in the stock. Caledonia sold at from $3@$2.60. Messrs. Laidlaw & Co. have been appointed transfer-agents, and the Farmers' Loan and Trust Company registrars of this company's stock. Father de Smet remains at from $4.80@$5.

There is little of interest to report in the business of the Comstock shares. Hale & Norcross was quoted at from $4.30@$4.10. Consolidated California & Virginia, at from $1.10@$1.40. The other Nevada stocks have been dull. A few sales of Eureka are reported at $3; and of Navajo at from 70@60c.

Horn-Silver ruled at from $2.25@$2.10, some 3100 shares changing hands. Ontario holds its own at from $24.75@$25.50. Stormont, at 9c.

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted so much per share.												Sales from Oct. 16th to Oct. 16th, inclusive.
		Oct. 10.		Oct. 12.		Oct. 13.		Oct. 14.		Oct. 15.		Oct. 16.		
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal														
Cameron Coal	50													
Col. C & I	10	18⅛	17¾	19⅞	18	20¼	19	21	19½	20⅛	19¾	20		11,200
Ches. & O. RR	100	7½						7⅞	7½	8	7¼	8	7¾	2,450
Consol. Coal	100					21½								100
Cumb. C. & I	100													
Del. & H. C	100	96¾	95	97	96	96	95½	96⅛	96	96⅛	94¾	96⅛	95¼	6,275
D., L. & W. RR	50	111⅞	110⅞	112¼	111	112¼	110¾	113⅝	112½	113¼	111⅞	114⅛	112⅞	269,626
Elk Lick Coal Co														
Lehigh C. & N.†	50	45½	45	45⅝	45			46½	46	46¾	46½			6,421
Lehigh Valley RR.†	50			56	55⅞			56½	56¼	56⅛	55⅞			861
L. & W. C. & I Co.														
Maryland Coal	100							9⅛						400
Montauk Coal	100													
Morris & Essex	50	128⅜		129	128⅞	127½	127¼			129				632
New Central Coal	100	8⅞	8⅛			8⅞		9		9¼	9⅛	9½		1,200
N. J. C. RR.	100	42⅛	41⅝	43	41⅞	43	41⅝	43¾	42⅞	43½	42	45	42¾	43,775
N. Y. & S. Coal	50													
Penn. Coal	50													
Penn. RR †	50	52	51¾	52⅝	51⅞			52⅜	52½	52⅞	52⅜			11,306
Ph. & R. RR.*	50	10⅝	15½	15½	15	15¼	13	15½	14½	16¼	15½	17	16¼	56,188
Spring Mountain	50													
Westmoreland Coal.†	50			60				60		60				73

* Of the sales of this stock, 28,248 shares were in Philadelphia and 27,940 in New York. Total sales, 410,507.
† The quotations for these stocks are not percentage, but actual price.

A few sales have been made in Moulton at $1.25, and in Silver King at from $5.88@$5.50.

The tables printed elsewhere give a complete summary of the market.

The following securities were sold at auction on the 14th inst.: $21,000 St. Louis Coal Railroad first mortgage 7 per cent bonds, 18; 1000 shares Dahlonega Mining Company, $11 for lot; 1000 shares Boston & Halifax Gold Mining Company, $7 for lot; 250 shares Alps Gold Mining Company, of Colorado, $2.50; 20 shares United States Petroleum Company, $10 each; 33 shares Grenada Gold Mining Company, of Colorado, for $4.

Coal Stocks.

We have had another week of the wildest kind of speculation. Every thing is going up, and much higher prices are spoken of all along the line. There was some reaction yesterday, under considerable realizing, and speculators who were going under full sail trembled for a moment; but to-day the sellers of yesterday are speculating with their profits, and prices are much higher. The coal stocks have been a feature for their strength, and much higher prices are spoken of. So long as the "boom" in the coal trade continues, it may be possible to keep up this movement. Although Reading stock would appear to be worthless, yet there appears to be good buying, and there is a feeling that it may be granted valuable "rights" under a reorganization, especially as somebody must furnish fresh capital to run the company.

The sales of Lackawanna aggregate 269,626 shares at $110¾@$114½, closing at $114⅛. Delaware & Hudson records sales of 6275 shares at $95@$97, closing at $96⅛. Reading sold up to $17 to-day, and closed at that figure, with sales of 56,188 shares for the week. The dealings in Jersey Central aggregate 43,775 shares at $41⅜@$45, closing at $44⅝.

New York, Susquehanna & Western has attracted considerable attention during the past week. Probably one cause for this has been that S. V. White accompanied the directors over the road early in the week, and satisfied himself that the company controlled 5000 tons of daily production of anthracite coal, or quite as much as the Pennsylvania Coal Company, and more than one fourth as much as Lackawanna controls. If the company's condition fails to improve, it will not be because in Mr. F. A. Potts it has not an able manager. Mr. Potts has been a great success in the coal trade, managed on an honest basis, and not by tricks of bookkeeping that have sometimes been resorted to to make certain of the companies appear to have made successes they in reality have not earned. The common stock of this company closed at $7¾, and the preferred at $19. There are rumors that the Lackawanna Company has been trying to secure a control. We give the rumor for what it is worth. The low price of the stock, and the value of an entire control of the business that this company has built up, make such a move not improbable, and much more plausible than many others the same company has made in the past.

The Rochester & Pittsburg Railroad was sold under foreclosure at Rochester to-day by John M. Davy, referee. Walter H. Peckham, of New York, was the only bidder, and secured the road for the lowest amount that the court would let it be sold for, $1,100,000.

Meetings.

Annual meetings will be held at the time mentioned:

Carbonate Hill Mining Company, No. 19 New street, Room 46, New York City, November 5th, at one o'clock P.M.

Ophir Gold Mining Company, No. 30 Cortlandt street, New York City, October 20th, at twelve o'clock M.

Dividends.

Adams Mining Company, of Colorado, has declared a dividend of ten cents a share, or $15,000, payable on and after the 20th inst., at the Farmers' Loan and Trust Company, New York City.

Homestake Mining Company, of Dakota, has increased its dividend No. 86 to forty cents a share, or $50,000, payable on the 26th inst., at the transfer-agency of Messrs Lounsbery & Co., Mills Building. Total dividends to date, $2,968,750.

Oxford Gold Mining Company, of Nova Scotia, has eclared a dividend of two cents per share.

ASSESSMENTS.

COMPANY.	No.	When levied.	Delinquent in office.	Day of sale.	Amount.
Andes, Nev	27	Sept. 3	Oct. 8	Oct. 28	.25
Benton Cons., Nev	14	Aug. 25	Sept. 30	Oct. 21	.10
Blue Buff, Cal	9	Aug. 22	Sept. 26	Oct. 19	.02½
Bodie Tunnel, Cal	11	Aug. 26	Oct. 1	Oct. 21	.10
Buchanan, Cal	13	Aug 24	Sept. 28	Oct. 16	.15
Con. Pacific, Cal	7	Aug. 27	*Oct. 14	*Nov. 9	.15
Eintracht Gravel, Cal	19	Aug. 11	*Sept. 28	*Oct. 17	.05
Equitable, Utah	32	Aug. 3	*Oct. 15	*Nov. 6	.10
Excelsior W. & M., Cal	8	Sept. 23	Oct. 24	Nov. 12	1.00
Exchequer, Nev	22	Aug. 31	Oct. 7	Oct. 29	.20
Giant, N. Mex	1	Aug. 11	Sept. 18	Oct. 18	.02
Hale & Norcross, Nev	87	Oct. 8	Nov. 12	Dec. 3	.50
Holmes, Nev	10	Sept. 28	Nov. 2	Nov. 27	1.00
Independence, Nev	15	Aug. 20	Sept. 23	Oct. 14	.20
Johnson Gravel, Cal	2	Sept. 3	Oct. 15	Nov. 20	.05
Martin White, Nev	11	Aug. 22	Oct. 7	Nov. 4	.25
Mexican, Nev	30	Sept. 21	Oct. 27	Nov. 18	.25
Mountain Tunnel, Cal	1	Sept. 28	Nov. 2	Nov 20	.10
Navajo, Nev	12	Aug. 31	Oct. 5	Oct. 27	.30
North Belle Isle, Nev.	8	Aug. 20	Sept. 24	Oct. 15	.10
Omilak, Alaska	3	Aug. 22	Sept. 23	Oct. 24	.10
Potosi, Nev	20	Sept. 28	Nov. 4	Nov. 25	.40
Sampson, Utah	1	Sept. 22	Oct. 24	Nov 16	.25
Savage, Nev	64	Oct. 5	Nov. 9	Nov. 30	.50
Sierra Nevada, Nev	83	Sept. 30	Nov. 4	Nov. 24	.25
Sul. Bank Qu'r, Cal.	4	Aug. 29	Oct. 9	Dec. 3	.51
Tuolumne, Cal	1	Sept. 15	Nov. 13	Dec. 15	.55
Union Cons., Nev	31	Sept. 14	Oct. 19	Nov. 9	.50
Virginia Creek, Cal.	2	Sept. 11	Oct. 16	Nov. 6	.20
Willow Creek, Cal	1	July 23	Sept. 7	Oct. 12	1.00

* Assessment postponed until above date.

Holmes Mining Company's assessment No. 9, of one dollar a share, levied August 3d, 1885, was rescinded September 28th, by order of the board of directors.

Pipe Line Certificates.

Messrs. Watson & Gibson, petroleum brokers, No. 49 Broadway, report for the week as follows:

From the activity that has been displayed in to-day's market and the rapid advance of 4¼ cents per barrel, which prices have recorded, it has at last become apparent that the statistical situation,

about which we have so long discoursed, has made itself felt upon the market. There has been an endeavor upon the part of the oil country producers to dispose of their productions in advance at or about $1 a barrel, in the innocent belief that such a price was a handsome compensation for their hard and diligent efforts at torpedoing; but the fact that the month of September showed nearly 400,000 barrels more consumed than produced is sufficient evidence of the natural causes that have caused and must cause an advance in the price of crude petroleum. We are still strong in the belief that oil will soon sell at $1.10@$1.15 a barrel, and that on or before January 1st, 1886, it will sell at $1.25 a barrel.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
Oct. 10	1.01⅜	1.01⅜	1.00⅞	1.01⅛	2,642,000
12	1.01¼	1.01½	1.00⅞	1.01⅛	3,601,000
13	1.01⅛	1.01¼	1.00½	1.00¾	2,697,000
14	1.01	1.02⅜	1.00⅝	1.01⅝	6,412,000
15	1.02	1.03	1.01⅜	1.02⅞	9,468,000
16	1.03¼	1.07	1.02¾	1.07	14,720,000
Total sales					39,540,000

San Francisco Mining Stock Quotations.

Daily Range of Prices for the Week.

Name of Company.	Closing Quotations. Oct. 9.	Oct. 10.	Oct. 12.	Oct. 13.	Oct 14.	Oct. 15.
Albion						
Alpha						
Alta			.20	.20	.25	
Argenta						
Bechtel						
Belcher	1.00			1.25	1.37½	1.50
Belle Isle						
Best & Belcher	1.25	1.25	1.25	1.25	1.25	1.25
Bodie	1.62½	1.62½	1.87½	1.87½	2.62½	2.37½
Bullion						
Bulwer						
Challar	1.00	.95	.85	1.00	1.12½	1.25
Con. Pacific						
Con. Cal. & Va.	1.25	1.25	1.25	1.25	1.25	1.25
Crown Point	1.12½		1.00	1.12½	1.25	
Day						
Elko Cons						
Eureka Cons				3.25	3.12½	
Exchequer						
Gould & Curry	.80	.75	.65	.70	.75	.75
Grand Prize						
Hale & Norcross	4.25	4.12½	3.62½	4.00	4.00	4.12½
Independence						
Martin White						
Mexican	.45	.40	.35	.35	.45	.40
Mono						
Mount Diablo						
Navajo	.65	.55	.50	.45	.50	.50
Northern Belle						
North Belle Isle						
Ophir	.80	.85	.85	.85	.90	.90
Overman						
Potosi	.20	.20	.15	.25	.25	.30
Savage	1.50	1.50	1.25	1.50	1.37½	1.50
Scorpion						
Sierra Nevada	.70	.70	.60	.65	.70	.70
Silver King						
Tip-Top						
Union Cons				.30	.35	.35	.60
Utah					.40	.40	.40
Wales Cons						
Yellow Jacket	2.00	2.00		1.87½	2.00	2.00

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

Boston, Oct. 15.

The stock market has absorbed the larger part of attention the past week, and mining stocks generally have been neglected. The exception is Franklin copper, which, for this stock, has been quite active and in good demand at better prices than last week; sales of about 1000 shares at $8½@$8⅝, a gain of $⅜; $8⅝ is bid, and $8¾ asked at the close to-day. We have frequently called attention to this stock as being cheap at the price at which it has been selling, and we confidently expect to see it sell at $10 before January 1st, 1886. In Calumet & Hecla, there has been very little trading, and we note a decline from $214, ex dividend, to $212, with sales of 32 shares only for the week. Tamarack, on a sale of 5 shares, only touched $80, but a larger lot coming on the market was sold at $78. The best bid to-day was $77, and offered at $80. Quincy was steady at $38 on small sales, until to-day, when buying orders advanced the price to $39, closing at $38 bid, $39 asked. Osceola advanced to $13 to-day on sale of 100 shares, but was offered at the same price at close. A sale of 100 shares of Atlantic was recorded early in the week at $6¼; last sale, September 4th, was 10 shares at $8. At $6¼ the stock is undoubtedly cheap, and will pay the purchaser a handsome profit. No stock was offered to-day at less than $7. There are slight indications of a move in the low-priced copper stocks. Pewabic sold at $1¼, the first sale for a long time. Allouez is also in better demand, and sold at 65c., which is an advance of 10@15c. over last sale.

Silver stocks continue dull and inactive. Bonanza sold at $1. Bowman declined to 4c. Catalpa, to 20c. Dunkin, 17c. The market generally is heavy, with a tendency to lower prices.

3 P.M.—There was no change to note in the market this afternoon. Coppers closed firm.

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to October 15th:

To	From Philadelphia	From Baltimore.	From New York shipping ports.
Alexandria	.60@.70		
Annapolis			
Albany			
Baltimore	.58§		
Bangor	1.10		1.05
Bath, Me	1.05@1.10	1.20	1.00
Beverly	1.10		1.00
Boston, Mass	1.05@1.10	1.25@1.30	1.00
Bristol	1.30		
Bridgeport, Conn.		1.10	.60
Brooklyn		1.10	
Buffalo, N. Y.			
Cambridge, Mass.	1.10‡		1.00‡
Cambridgeport	1.10‡		1.00‡
Charleston, S. C.	.75@.80	.80@.90	
Charlestown	1.10		1.00
Chelsea	1.10		1.00
City Point			
Com. Pt., Mass.	1.15		1.00
E. Boston	1.05@1.10		1.00
East Cambridge	1.10		
E. Gr'nwich, R. I.			
Fall River	1.00		.75
Galveston	1.85@2.00	2.00	
Gardiner, Me		1.20	
Georgetown, D.C.	.60@.70		
Gloucester	1.15		
Halifax			
Hartford			
Hackensack			
Hudson			
Lynn	1.20@1.25		
Marblehead			
Medford			
Milton			
Mobile, Ala			
Newark, N. J.			
New Bedford	.85@.95		.80
Newburyport			1.15
New Haven		1.10	.60
New London			.70
New Orleans			
New-Berne	1.00		
Newport	1.00		.75
New York		1.00@1.05	
Norfolk, Va	.50@.55		
Norwich			.75
Norwalk, Conn			
Pawtucket			
Philadelphia			
Portland, Me	.85*	1.25@1.30	
Portsmouth, Va.	.55		
Portsmouth, N.H.	1.15		1.15
Providence	.95@1.00	1.15	.75
Quincy Point			
Richmond, Va	.60		
Rockland, Me			
Rockport			
Roxbury, Mass.	1.10‡		
Saco			
Sag Harbor			
Salem, Mass.	1.10@1.15		1.00
Saugus			
Savannah		1.00@1.05	
Somerset	.90	1.15	
Staten Island		.95	
Trenton			
Washington	.60@.70		
Weymouth			
Williamsbg, N.Y.		1 10	
Wilmington, Del.			
Wilmington, N.C.		.85@.90	

* And discharging. † And discharging and towing. ‡ 3c. Per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing ** Below bridge