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DR. E. D. PETERS, metallurgical engineer, has returned to Houghton, Lake Superior, on professional business.

MR. D. W. BRUNTON, of TAYLOR & BRUNTON, mining engineers, Colorado, has gone to Rocky Bar, Idaho, on professional business.

THE water-jacket was used, we are told, on a reverberatory furnace at Balbach's Works, in Newark, New Jersey, in 1873, and was then patented. This was probably the first use of this valuable invention.

PROF. THEODORE B. COMSTOCK, mining engineer, is making a professional tour of Colorado, Utah, and New Mexico, and his services can be secured for professional work in those districts. His address will be found in our advertising columns.

EVEN engineers, who of all men should be the most practical and utilitarian in their tendencies, sometimes allow a morbid desire to manu-

facture difficulties to take possession of them. A short time ago, one of our own distinguished professors, inspired by a melancholy ambition to out-Herod Herod, deliberately and in cold blood went to work to manufacture a gold ore from which it would be impossible to extract the gold, forgetful that nature had already hedged around the extraction of gold from its ores with quite enough of difficulty without making it absolutely impossible. And now we hear of a certain Professor MILNE, in Japan, who has actually commenced the manufacture of artificial earthquakes, as though nature could not produce horrors enough with the real article. Of course, these professors pretend they are doing these things "in the interest of science," and that humanity is to be benefited in some mysterious manner from their investigations; but every sane engineer knows better, and we are but echoing the sentiments of the profession when we at once protest against this worse than suicidal mania. When a metallurgist or geologist has not only mastered the sum of human knowledge, but has exhausted the secrets of nature herself, he should modestly stop there. But if the mania seizes on him to actually prepare for his fellows difficulties and dangers that even nature had not thought of, it is time he should be put under restraint.

GOLD VOLATILIZATION.

We publish on another page an interesting letter from Prof. HENRY WURTZ, giving some historical data concerning the early knowledge of the volatilization of gold and gold chloride. Did time and space permit, later and possibly also earlier data to the same effect could be cited; but the general knowledge of the fact for years past is sufficiently established. Mr. STETEFELDT has made further experiments on the volatilization of gold in roasting, and has found the loss of gold quite as great when neither copper nor iron was present, in the simple case of salt-roasting a free gold associated with a quartz and calc-spar gangue. His earlier conclusions have therefore been modified.

It appears now that the fineness of the particles of gold is the most important element, and the time occupied in roasting has also always been recognized as a factor in the case. Mr. STETEFELDT thinks, and we believe justly, that instantaneous roasting in a Stetefeldt furnace, where the nature of the ore admits this, will prevent a large part of the loss; and certainly, the subject is sufficiently important to induce careful experiments in this direction. It is well known that the less time that is occupied in chloridizing-roasting of silver ores, not only the less is the loss of silver by volatilization, but the higher is the percentage of the metal that can be extracted by subsequent amalgamation; and roasting in the Stetefeldt furnace has given exceptionally favorable results in this respect.

DANIEL JOHNSON MORRELL.

THE Hon. D. J. MORRELL one of the most prominent iron and steel manufacturers of the country, and for years general manager of the Cambria Iron-Works, died at his residence, in Johnstown, Penn., on the 20th inst., aged sixty-four years. Born August 8th, 1821, Mr. MORRELL was reared on a farm at Berwick, Me., and was early taught lessons of economy and self-reliance. His religious training was that of a devout Quaker home. In 1837, being sixteen years old, he left home and went to Philadelphia, to serve as a clerk for five years in the wholesale dry goods house of TROTTER, MORRELL & Co., in which his elder brother was a partner. Then, in 1842, that firm was dissolved and the two brothers founded a new one. Branch houses were founded in various cities, and the business greatly prospered. Finally, after numerous changes, in 1855 Mr. MORRELL retired from the dry goods trade, and with a small capital went to Johnstown, Pa., to assume management of the Cambria Iron-Works, which had been founded two years before, and in which he and his brother were stockholders. The Cambria Iron-Works, started in 1853, had failed in 1854, and he came upon the scene in the capacity of a creditor who wished to realize as much as possible from his investment in the broken concern. A company was organized under the firm name of WOOD, MORRELL & Co., and secured a lease of the works for five years. Mr. MORRELL was the active manager. In 1860, the lease was extended for two years; and in 1862, the Cambria Iron Company was reorganized with CHARLES S. WOOD as President, EDWARD Y. TOWNSEND as Vice-President, and DANIEL J. MORRELL as Superintendent of the works. Since then, the new company has had control of the works, absorbing the firm of WOOD, MORRELL & Co.

THE MINERAL STATISTICS OF THE UNITED STATES, 1884.

We have been favored with advance-sheets of the report upon the mineral resources of the United States for 1883-1884, by ALBERT WILLIAMS, Jr., Chief of the Division of Mining Statistics and Technology.

We have already called attention to the great delay in issuing a report that, to be of use, should be in the hands of the public early in the year. The greater part of the statistics was in hand early in February, and indeed, we published in the ENGINEERING AND MINING JOURNAL early in the year full statistics of copper, lead, quicksilver, iron, gold, and silver,

and some other minerals, so that to have the official report publishing the same figures six months later seems somewhat absurd.

Any thing that is worth doing at all is worth doing well, and every intelligent man must recognize the immense importance and value to the country of full and accurate reports of our mineral production.

That the report is disappointing, both in the date of its issue and in the incompleteness of the information it gives, is painfully apparent, and it must be especially discouraging to Mr. WILLIAMS, whose herculean efforts, though they have accomplished much, have not been able to effect the impossible.

That this most important department, whose work has perhaps a more immediate measurable commercial value than that of any other portion of our Geological or Scientific Survey, should be so neglected and starved, is a blunder that has not been explained, and as far as we know can not be justified. The country with great liberality votes something like half a million dollars a year for the Geological Survey work and only about one per cent of this is devoted to the work of collecting mineral statistics, aside from the salary of the chief of the bureau. It is not surprising, therefore, and it involves no blame to the chief of the bureau, that the work is neither as accurate nor as full as the interests of the country demand.

In the ENGINEERING AND MINING JOURNAL of July 4th, we published a summary of the mineral production of the country as given in this report. We shall now take up more in detail the principal items.

The coal production of the country is the first subject treated in this report, and we regret to find the statistics wholly inaccurate.

Mr. WILLIAMS says that these coal statistics "have been drawn from various sources," and he quotes some that are notoriously inaccurate and slovenly as having been adopted in many cases.

COAL PRODUCED IN THE SEVERAL STATES AND TERRITORIES, NOT INCLUDING THE LOCAL AND COLLIERY CONSUMPTION.

STATES AND TERRITORIES.	1882.	1883.	1884.
	Long tons.	Long tons.	Long tons.
Pennsylvania, anthracite	29,120,096	31,793,027	30,718,203
Pennsylvania, bituminous	22,000,000	24,000,000	25,000,000
Illinois	9,000,000	10,350,000	10,000,000
Ohio	9,450,000	8,229,429	7,650,062
Maryland	1,540,466	2,206,172	2,469,051
Missouri	2,000,000	2,250,000	2,500,000
West Virginia	2,000,000	2,805,565	3,000,000
Indiana	1,976,470	2,560,000	2,260,000
Iowa	3,500,000	3,881,300	3,903,458
Kentucky	1,300,000	1,650,000	1,550,000
Tennessee	850,000	1,000,000	1,200,000
Virginia	100,000	225,000	300,000
Kansas	750,000	900,000	1,100,000
Michigan	130,000	135,000	135,000
Rhode Island	19,000	10,000	10,000
Alabama	800,000	1,400,000	2,000,000
Georgia	175,000	200,000	200,000
Colorado	947,749	1,097,851	1,068,950
Wyoming	631,932	696,151	805,911
New Mexico	146,421	188,703	196,924
Utah	250,000	250,000	250,000
California	150,000	175,000	150,000
Oregon	30,000	50,000	50,000
Washington	225,000	300,000	300,000
Texas	100,000	100,000	100,000
Arkansas	75,000	75,000	150,000
Montana	60,000	60,000	60,000
Dakota	50,000	50,000	40,000
Idaho	10,000	10,000	20,000
Indian Territory	175,000	175,000	400,000
Total	87,083,134	96,823,198	97,527,649

"Including the local and colliery consumption, the figures for the last three years would be as follows, the values being values at the mine:"

TOTAL COAL OUTPUT OF THE UNITED STATES, 1882, 1883, AND 1884.

YEARS.	ANTHRACITE.		BITUMINOUS.		TOTAL.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
1882	Long tons. 31,358,264	\$70,556,094	Long tons. 60,861,190	\$76,076,487	Long tons. 92,219,454	\$146,632,581
1883	34,336,469	77,257,055	68,531,500	82,237,800	102,867,969	159,494,855
1884	33,175,756	66,351,512	73,730,539	77,417,066	106,906,295	143,768,578

Among the most important errors in the above tables are:

1st. Though the figures are said to be "long tons" = 2240 pounds, the statistics in all cases except Pennsylvania anthracite and Maryland bituminous coal are made in short tons of 2000 pounds.

2d. Short and long tons are added together to get a total called "long tons."

3d. The production figures not only adopt these purely imaginary totals for the years when no official figures were collected, but even disregard the census figures of 1880. And in using figures of inspectors of mines, which the inspectors state are tons of 2000 pounds, they are here stated to be "long tons" = 2240 pounds.

4th. The second table given above increases the enormity of the blunder

by adding to the shipments of anthracite 8 per cent for consumption at the mines, though from 5 to 6½ is stated in a previous page as the proper allowance, and then to figures of bituminous coal, already more than 10 per cent too great, an additional more than 10 per cent is added for colliery consumption, when in reality one per cent would be more than sufficient to cover this item.

The inspectors' and other official reports and special information in our possession convince us that the actual total production of coal in the United States in 1884 did not exceed 90,000,000 TONS OF 2240 POUNDS, instead of 106,905,295 gross tons, as given above.

Fortunately, these coal statistics are not a sample of the remainder of the volume, and we shall have a more agreeable task in noticing, as we shall do next week, the other sections of this report.

CORRESPONDENCE.

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

The Nacimiento, New Mexico, Copper Deposits.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: July 18th, you had an editorial article on Copper Ore from Texas, and refer to that of the Nacimiento District, New Mexico. Having been here myself some considerable time in the last and present years, and having from time to time carefully examined the mines and copper ores, I can say that but little is at present known of the distribution of the copper ore, the only work done being so-called prospect-work. That, in one instance, has developed replacements of the trunks, etc., of trees, of solid copper glance, varying in diameter from two feet by one foot down to six or eight inches; these, with concretionary nodules of the same character, being imbedded in sandstone, sometimes pure white, but oftentimes stained for a considerable depth with green, and some blue carbonate of copper. The sandstones are often accompanied with bodies of gray and red clay shales. In one case, where the copper-bearing rock is a great body of coarse conglomerate, the copper glance is finely disseminated through one particular stratum. The copper ore is only in one instance, and that not immediately, accompanied with gypsum. It occurs there in pockets in the sandstone as a pure white lining of fine, distinct but fragile crystals. My determinations of the lime, in bulk samples of many tons of copper ore, varying in percentage from fifteen to fifty per cent metallic copper, never give more than four tenths of one per cent, and usually from one to two tenths of one per cent, of carbonate of lime. The great beds of gypsum are one thousand feet at the least, measured across the stratification, to the west of, and geologically above, the copper-bearing sandstones.

The percentage of iron varies with the percentage of copper as glance, usually running from four to ten per cent metallic iron.

In this district, the copper ore never fills the cracks of minute fissures in lignite, but lignite does fill the cracks of minute fissures in the copper ores.

The vertical veins or beds of Jurassic coal and of clay iron-stone (siderite) are at least 2000 feet to the west of, and geologically above, the copper-bearing sandstones.

The copper-bearing sandstones can be traced for many miles.

I send a small specimen of copper glance. Yours truly,
COPPER, BERNALILLO CO., NEW MEXICO, August 10. WILLIAM JENKS.

The Volatilization of Gold.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: My attention has been called to your interesting review of Mr. C. A. Stetefeldt's experiments, which bring out exceptionally heavy losses of gold through volatilization in chloridizing-roasting, a review which you base on my summary as the American correspondent of the London Mining Journal. Your references to the literature of the subject are of value, but they certainly do not show that Mr. Stetefeldt's results are not "remarkable." I did not state that the discovery of heavy losses of gold in chloridizing-roasting were "nowhere on record." What I did say was, that "there is nowhere on record such a series of figures," referring directly and unmistakably to the table you have reproduced.

As for the charge that my announcement was accompanied by "fulsome flattery (which must be rather embarrassing to Mr. Stetefeldt)," I must assume that it relates to the statement made by me that that gentleman "undoubtedly occupies the rank as our leading metallurgist." I do not propose to quarrel over a matter of personal opinion, though I know that my own is shared by many in the profession and out of it; but I would point out to you that, in writing for an English public, it is necessary to give the credentials of men quoted as authority by me or others, and that it is the duty of a correspondent to do so unflinchingly, whether he speaks words of commendation or of condemnation.

NEW YORK, Aug. 20. CORRESPONDENT LONDON MINING JOURNAL.

[The following is the full text of the paragraph from the London Mining Journal referred to by our correspondent. The italics are ours. The table appeared in the ENGINEERING AND MINING JOURNAL last week.

"So far as I am aware of, there is nowhere on record any such a series of figures. Mr. Stetefeldt advances the explanation that the volatilization of the gold takes place with that of the cuprous chloride, and that magnetite, as a contact reagent, plays an important part in this heavy loss. The subject is one which deserves very thorough study, and Mr. Stetefeldt will reap the thanks of the mining community if he will teach them its origin, and thus lead in the first step to progress."

If our correspondent supposed that Mr. Stetefeldt had made here an original discovery of the loss of gold by volatilization in chloridizing-roasting, his extravagant expressions about "teaching the mining community" the "origin" of gold volatilization, and his double superlative,

that Mr. Stetefeldt would "lead in the first step to progress," would be at least intelligible, though they would do a wrong to those who had years before made the same discovery; but if, as our correspondent states above, his reference was simply to the figures of the table, as something "nowhere on record," and he did not intend to assert that Mr. Stetefeldt had made any original discovery, then his expressions which we have italicized could scarcely be considered as any thing less than "fulsome flattery." No one would think of using such expressions about the experimenter who only verified or even rediscovered some one else's discovery. This is simply a question of fact, and not at all one of "personal opinion."

We do not wish to detract in the least from Mr. Stetefeldt's credit as a metallurgist—he has for years been one of the most esteemed contributors to the ENGINEERING AND MINING JOURNAL—nor do we undervalue the important experiments he has made; but when, as we and others read it, it was claimed that the loss of gold by volatilization in chloridizing-roasting was something entirely new and just discovered, it was simple justice to other metallurgists to state what the facts in the case actually were. Our citations and remarks last week were not intended to exhaust the subject. And if now, so many years after the discovery was actually made, it is impossible to say who "taught its origin" or "led in the first step to progress," at least we would not have the statement go abroad uncontradicted that American engineers have been, up to this time, ignorant of the fact. "Unflinching commendation or condemnation" of the individual is entirely proper, but it should not be made at the expense of justice to a whole profession.—EDITOR ENGINEERING AND MINING JOURNAL.

The Bricking of Fine Ores.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I have not noticed any answer to Dr. Peters's inquiry, made some time ago, for a practical method of bricking fine, rich material that has absolutely no binding quality. The suggestion I will make may not be practical with his particular material and under his peculiar circumstances, but it has been used for years by the Tombstone Mill and Mining Company in bricking its concentrates for the furnace.

It consists simply in grinding the stuff in a pan. The effects of attrition in producing the adhesive quality in material that has none has been known for ages, and are well exhibited in the Tombstone mills. The ore is distinctively quartzose, and contains probably about 90 per cent of quartz with iron oxide, manganese, lead carbonate, and some sulphides. Of clay, there may be from two to three per cent, and often less.

This ore is stamped and ground for an hour in the pans, treated with quicksilver, and discharged to the concentrating mill, where it is separated in various concentrating sizes and in slimes that are too fine for treatment, even on the very efficient slime-washer used there. The finest slime-washer treats successfully material of not more than $\frac{3}{100}$ th inch diameter, and this stuff, like Dr. Peters's material, has no binding quality whatever.

This, however, is not the slime. The coarsest of that is not larger than $\frac{1}{100}$ th or $\frac{1}{200}$ th inch in diameter, and runs down to $\frac{1}{1000}$ th inch or less. It is settled in tanks, and forms the binder for all the concentrates. The heads from all the machines are mixed together, and with a certain quantity of slimes that depends upon the supply and the appearance of the bricks as they are made. From one quarter to two fifths slime may be taken as the usual proportions.

This slime contains at least 85 per cent of silica, as shown by several analyses. It has also about 8 per cent of lead carbonate, various manganese oxides, and, from the known brittleness of pyrite, I presume there must be a concentration of this mineral also in the slime.

None of these minerals has any binding quality in itself, and a doubt arises in my mind as to Dr. Peters's success in undertaking to apply the Tombstone experience in his substance. If it is chiefly metallic, he may fail; for I do not know that the metal minerals will gain the necessary quantity of adhesiveness by grinding. I am inclined to suspect that the actual binder in the slimes is the quartz, and that this mineral, when reduced to sufficient fineness, especially if the reduction is accompanied by rubbing, becomes adhesive. The adhesive qualities of dung have been utilized for centuries, and the most adhesive manure appears to be that of animals whose *débris* consists most largely of the siliceous coatings of grasses, as, for instance, cows.

It is noteworthy that the plasticity of the siliceous slimes was not a fleeting quality, or dependent upon any mysterious property due to rubbing action. It inhered in the finest slimes, and these could be separated from the coarse sands, and then mixed again with the metallic part of the sands after the coarser quartz grains had been removed from them, and still perform their function.

The bricks were made of concentrates, flue-dust, and slimes in such proportions as the run of business afforded, and bricked in a machine of the expulsive and non-compressive kind. They were dried in the air, and in summer made an admirable brick; hard, smooth, and not much subject to dust-making on the surface, which was the best part, owing to superficial compression. Run through a 35-ton shaft-furnace, at the rate of from 40 to 45 tons a day, they made comparatively little dust.

I have written a long letter about a matter that may appear small; but the subject is one that has growing importance in view of the rapid extension of concentrating mills, and the offering of fine material to smelting-works that are composed mainly of shaft-furnaces.

As a mode of handling concentrates and flue-dust, bricking offers very great advantages, and the binding material I suggest is one that every concentrating-works can supply in quantity, and would be glad to dispose of at a small profit.

Now that I have given a bit out of my own experience, I would like to ask whether any of your readers can give information about bricks that have been made by pressure. The laminating effects of pressure are well known; but the whole object of bricking, as applied to lead and silver ores, is to get the concentrates down to a certain depth in the furnace before dust-making begins.

I would like to know whether pressed ore brick crumble readily in the air, and whether they split up in drying over a quick fire.

The system of bricking concentrates for the shaft-furnace may fail in winter, on account of the cost of artificial drying; but if one of the

many good pressure brick-machines can be used, and the raw brick be thrown into the furnace, the system will be complete, and the cost of handling less than when a drying-yard has to be furnished and worked.

PRESCOTT, ARIZONA, August 11.

JOHN A. CHURCH.

The Defects of the Mining Law and their Remedies.

(Continued from page 90.)

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: We pointed out in our previous article the confusion that arises from the faulty manner in which claims are monumented and described, and that the errors that are necessarily committed by illiterate men laying out claims without compass or tape-line are placed on record, while the monuments disappear; and thus, when the claims come to be patented, their proper original position is a matter of speculation.

But the trouble does not end here. Right of possession depends on the regular annual performance of assessment-work. Failure or insufficiency for one year cancels the title, and on this point there are no records or written evidence. Any man's title can be called in question, on the plea that in some given past year he failed to do assessment-work, or did only \$80 worth. Unless he can prove to the contrary, some jumper's claim may be maintained, and it may be very difficult to find witnesses as to a long-past work, in a shifting population like that of the West. On the other hand, while it may be difficult to sustain your claim to your own property, it may be equally difficult to disprove the allegation of some blackmailer who asserts that he had an interest in a previous claim covering the same ground, and that his claim is good, because some one or other of the old holes was made by him, and the claim was relocated with some vague understanding that he should have an interest in it. There are hundreds of such suits pending. They are never instituted until a piece of property proves valuable, or until it passes into wealthy hands. Then the lawyers and their myrmidons begin to buzz around the unfortunate fortunate one like a swarm of mosquitoes, till he curses his luck and wishes he had not struck ore, but was still one of the crowd who at least have hope to comfort them. To collect witnesses from the ends of the West is a very expensive process. I have known it to cost \$1000 to find a single witness in a remote Mexican mining district, and bring him to give evidence in a case that had absolutely no merit, but was instituted simply to extort money. The plaintiff, in such cases, is often what we would call a pauper; but no such ignoble name is ever used out there, and his case is managed at no cost to him, or, in fact, to themselves, by lawyers. The judge generally rules favorably to the working miner on questions admitting of doubt, and the jury always, unless influenced by substantial considerations, decides against capital, and therefore a case based on the flimsiest pretense may expose property to so much danger that the owner, rather than run the risk of trial, meets the intention of his opponents, and compromises.

Some remedy for this great grievance should be applied, and we think the practice of other countries similarly situated to our own is the simplest.

In Australia and the Cape of Good Hope, within a certain time after a claim has been located, it must be surveyed by a government surveyor, and the plat of the claim filed in the surveyor-general's office. It is the duty of the surveyor to see that it does not infringe or overlap neighboring claims, which, as all previous claims have been laid down on the map of the district, can be determined with certainty. From the date of location, locators in the Australian colonies pay a rental of £5 sterling, and are required annually to do £20 worth of assessment-work. The receipt for the rent is proof of possessory title, and the particular tract of land for which rent is paid, and on which assessment-work is done, is known beyond dispute, and its history can be traced in the records. A somewhat similar practice prevails in Mexico, where the government inspector—*Peritos*—examines annually every claim and certifies to the work done.

If a claim is worth locating, it is worth the expense of a survey. If, when it is located, each claim in a mining district were surveyed and laid down on a general map, and all overlapping and errors of location corrected, and if the name once given to a claim, as laid down on the general map, were required to be retained, and under any relocation it should be registered under the same name, the perplexing confusion that now prevails would be removed. And the identity of each location being thus determined, much of the uncertainty attending the title of unpatented ground would disappear, if the law further required that proof of assessment-work be filed year by year. The local regulations of some mining districts impose this condition; but it should be made obligatory by statute.

Before the government gives virtual possession of a portion of the public domain to one of its citizens, his fellow-citizens have at least a right to demand that the locator should file a description and plan of what he claims. There are outlying districts where the cost of a survey would be great; but if these districts really possess good claims, many months do not pass before they are comparatively populous. A certain time should be allowed between provisional and corrected location, and this might be extended for certain exceptionally situated districts. If government levied a fee of \$20 per claim for the survey, that indiscriminate locating of claims that is now practiced would be checked; the prospector who has located what he really believes to possess value would be protected; and the miner who purchases from the prospector would at least know that he is buying a piece of land, and not merely a lawsuit.

As it is, the purchaser of an unpatented claim does not know what land he is buying, and if a patented claim, who his co-owners may turn out to be. And his lawyer can not help him much. A lawyer is called on to pass an opinion on the title to a certain location. He finds in the county records the location notice and certain deeds of purchase and sale. He judges of the title from these. But this identical piece of ground may in its entirety or in part have been located half a dozen times previously under as many different names, and each of these locations may conceal as many possible lawsuits. Yet unless the lawyer happens to know the district intimately, or can inveigle into his confidence some old-timer, who is willing, drunk or sober, to retail the local history and gossip of the camp, and the schemes of all its rogues, the legal adviser of

the proposing purchaser is perhaps misleading his client and innocently sowing a crop of litigation.

It seems to us unquestionable that the country has a right to require that every portion of the public domain that is appropriated shall be intelligibly described; and if assessment-work is in the nature of rent, the rentee should be able to show a receipt or certificate. The existence of such a certificate alone would be *prima-facie* evidence of legal possession. If the claim should be relocated by another, and another certificate be filed, it should be obligatory on the new claimant at once, while the facts of the case are easy of demonstration, to prove the failure of the original locator to fulfill the requirements of the law.

If some such plan were adopted, the real ownership of a mining claim would at any time be as capable of proof as if the parcel of ground were a section of arable land in an agricultural State or a corner lot in this city; and such certainty of tenure we look upon as the principal aim of any law affecting real estate, and any law that does not secure it is imperfect and should be forthwith amended. DENVER.

The Volatilization of Gold.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The unexpected honor done me in your note of August 13th, in asking me, "What do you know about the volatilization of gold, in chloridizing-roasting, or otherwise?" (referring me to your editorial of August 15th, now before me) calls for such response as is in my power. Your further remark, "You know all about it, I have no doubt," is a little surprising to me; and I only wish I could better justify your compliment. I say unexpected and surprising, because, though in former years my name was well enough known to those who study the king of metals, and his "tricks and manners," this has not been so of late years. It is an unlucky fact that those who pay court (in the way of science) to this monarch of the gnomes do not thereby necessarily acquire court favor with him; and hence my own allegiance has been transferred perforce to other realms.

The current chemistry and metallurgy of gold are accordingly not now so much at my immediate command as they have been. I comply with your request as well as I can, at short notice; and it may be that even such scattered memoranda as I find at hand, although some are rather ancient, will prove at least historically interesting to your readers.

1. *With regard to Metallic Gold.*—In the second London edition of the *Encyclopædia Britannica*, date 1778, it is stated that "the action of the fiercest furnace fires occasions no alteration in gold. Kunckel kept gold in a glass-house furnace for a month, and Boyle kept some exposed for a still longer time, without the loss of a single grain. It is said, however, to be dissipable in the focus of a large burning-mirror." (Boyle died in 1691.)

Gmelin (*Handbuch der Chemie*, Dritter Band, 1844, page 657), cites on Homberg's authority, that "A silver plate held over the surface of gold, which is highly heated by a burning-mirror, became gradually gilded." This observation must date about the beginning of the last century, as the famous Homberg died in 1715.

As to the volatilization by the electric spark, which has been maintained as a fact by some, I find an early observation in Benjamin Franklin's *Experiments and Observations on Electricity*, fifth edition, London, 1774, a paper dated 1749, from which I glean, in substance, as follows:

"Place a narrow strip of leaf gold between two strips of glass, with ends hanging out loose beyond the glass. Bind the glasses together with silk, and send the flash through it from a large electrified jar. Then, if your strips of glass remain whole, you will see in several places a metallic stain on both the glasses. The metal appears to have been not only melted, but even vitrified, or otherwise so driven into the pores of the glass as to be protected by it from the action of the strongest *aqua regia*." This experiment, by reason of the familiar tendency of the disruptive electric discharge, to rend apart the particles of bodies with a species of explosive force, does not appear to prove anything with certainty; and has not the weight of the burning-mirror experiments.

Next, I find again in the same 1778 edition of the *Encyclopædia Britannica*, the following: "Mr. Macquer hath found that gold, when exposed to the heat of a good burning-glass, loses in weight considerably, and that even in a very short time. He held some very fine gold in the focus of a large burning-glass, at several times, half an hour each time; and whenever the air was very clear, and the sun bright, a very sensible smoke arose to the height of three or four inches. To know the nature of this smoke, a cold silver plate was exposed to it; by which means, some of the vapor appeared on the silver like a tarnish, a little less white, but not sensibly yellow. But when this part of the silver was rubbed with a burnisher, it appeared so evidently to be gilded that none could doubt the evaporation of the metal. At this experiment, several members of the Academy of Sciences were present" (subsequently mentioned as Montigny, Cadet, Lavoisier, and Brisson). It is added that the burning-mirror employed was "the same formerly employed by Homberg;" and indeed Macquer's experiments were merely repetitions and verifications of Homberg's before cited. Their precise date does not appear; but as Lavoisier did not become an Academician till 1768, such date was subsequent to this.

Coming down next to the beginning of the present century: Dr. Robert Hare, of Philadelphia, published in a European journal (*Tilloch's Magazine*), in 1802, his oxyhydrogen blow-pipe experiments; and set forth the now undoubted facts of the vaporization of the precious metals by that device; adding: "Had I sufficient confidence in my own judgment,* I should declare that gold, silver, and platina were thrown into a state of *ebullition* by exposure on carbon to the gaseous flame; for the pieces of charcoal on which they were exposed became washed or gilt with detached particles of the metal in the parts adjoining the spots where the exposure took place." With his "deflagrator," he proved subsequently the truth of this inference of the volatility of these metals (not only confirming the original discovery of Homberg, but extending it to artificial heat).

In 1812, the elder Silliman repeated and confirmed Hare's volatilization of the precious metals by the compound blow-pipe; and further, in 1822,

* Hare was at this time but about twenty years old!

his like results with the deflagrator, which latter form of the voltaic battery was invented by Hare in 1816.* Silliman proved the vaporization of carbon also by the deflagrator. Finally, Deville, in smelting native alloys of platinum and gold, volatilized and condensed gold appreciably (*Dingler's Polytechnisches Journal*, 154, 138).

2. *With regard to Oxidizing-Roasting.*—Several chemists and metallurgists have observed and verified the vaporization and loss of gold, as well as silver, in laboratory and furnace operations in which volatile oxides of other elements are evolved. I am able at this time, however, to refer specially only to a memoir of W. Fuchs, in the *Wiener Academie Berichte* for October, 1850, page 270. My memorandum reads thus: Behavior of gold and silver by roasting matters containing them. A black copper, containing arsenic and antimony, when roasted, showed a very appreciable loss, most important during the earlier stages of the roasting, and ceasing when the oxidation was completed. After roasting, when treated with sulphuric acid, and again roasted, gold and silver were again lost only when coal was present in the mass. After citing other similar results, he concludes that the volatilization of gold and silver through roasting arises only through the mediation of volatile metals, and by no means through that of sulphur, sulphides, or metallic oxides; a conclusion not supported by other chemists. Thus, many analysts have alleged the finding of appreciable gold in iron pyrites, which show no trace of it, when the sulphur has been roasted off, and assays made as usual. Homberg, as early as 1709, was one of these analysts, and his facts were confirmed by others. (See Roscoe and Schorlemmer's *Chemistry*, Vol. 1, p. 7).

A paper on this subject, by J. M. Merrick, will be found in the *American Chemist* for November, 1871, page 169.

With regard to silver vaporization, the statement may be cited of Malaguti and Durocher, in 1849 (*Comptes Rendus*, Vol. 29, p. 689), that blende lost half its silver in roasting, part of which they recovered from the condensed fume.

The vaporization of gold with lead was asserted some years ago by Roessler (*Dingler's Polytechnisches Journal*, Vol. 206, No. 3).

3. *As to Chloridizing-Roasting*, or cases generally in which the volatile medium which possibly carries off the gold in some yet unknown form is *chlorine gas*.—There appear to be facts known which would prepare the mind of a chemist to expect or suspect such results.

The oldest mention of this matter I know of, I have discovered in an edition of 1699, of *Boyle's Works*, which I happen to possess. In Vol. 1, p. 65, of this ancient work, I find that, after mentioning the obtaining of crystals (of terchloride of gold) from a solution of the metal in *aqua regia*, he proceeds to say: "And from the Parts of Gold divided by a stronger menstruum, so minutely as to be capable of being sublim'd, I have obtained Crystals much of the same shape." On page 95 of the same volume, also, he says he dissolved gold in this same "stronger menstruum" (which turns out to be essentially *aqua regia*, made by precipitating concentrated antimony-chloride with nitric acid), and digested the solution in a retort on a sand bath. In time (how long not stated), "red Crystals like Rubies" appeared in the neck of the retort; "which in the Air would run *per Deliquium*" (that is, deliquesce).

As Boyle died in 1691, if the alleged volatility of gold-chloride with other vapors should not prove a fallacy (I do not find that Berzelius confirms it), it follows that it has been known for some two centuries.

On page 96, he speaks of "a Volatile Gold in some Oars [ores], where none of that Metal is to be found." This was twenty years or more previous to the analyses of pyrites by Homberg and others before referred to.

A statement of purport similar to Boyle's occurs in the 1778 edition of the *Encyclopædia Britannica*, before cited (Vol. 3, page 1851.) In describing the dissolution of gold by distilling *aqua regia* over it, it is stated: "The marine acid remains combined with the gold in a blood-red mass. If toward the end of the distillation, the fire is hastily raised, part of the gold distills in a high saffron-colored liquor; and part sublimes into the neck of the retort in clusters of long slender crystals, of a deep-red color, fusible in a small heat, deliquating in the air, and easily soluble in water. By repetitions of this process, the whole of the gold may be elevated. This red sublimate of gold is said to be easily fusible with the heat of one's hand, and to be shown as the alleged miracle of the blood of St. Januarius."

The work of Mr. Aaron, from which you quote, Mr. Editor, I have not read; but if it can be admitted as established that gold, or its chloride or other compound, evaporated in a current of gas or vapor containing chlorine, such current may readily be admitted to be producible by roasting with salt, if only silica be present; as the air might thus, under favorable circumstances, be charged with both hydrochloric acid and chlorine gases. Nevertheless, losses of such amounts as have been set forth are difficult to understand and accept, and it is to be hoped that this highly important subject—apparently still quite obscure—now that it has been taken up by such skillful hands, and by a mind so ripe in knowledge and experience, as those of Mr. Stetefeldt, will not be allowed to rest until we have some more satisfactory light upon the real facts of gold volatilization, as well as on the real chemical nature of these phenomena. Respectfully, HENRY WURTZ, Ph.D.

333 SECOND AVENUE, NEW YORK CITY, AUG. 17, 1885.

Electricity at the Mines.—The Ashington Coal Company is about to have the electric light adapted to the requirements of its extensive colliery near Newbiggin, Northumberland, England.

A Russian Expert Expedition.—The Russian government proposes sending experts to Turkestan, to study the turquois mines on the Persian frontier. The same commission will visit the sulphur deposits recently discovered near Khiva, and the lignite mines and petroleum springs in the district of Ferghana.

* Very strangely, Snow Harris, in his work on "Galvanism," first published in 1850, not only distinctly puts forward a claim of his own to have first discovered and published, in 1831 (!), the principles on which the deflagrator is founded, but goes on to recite, as a subsequent and consequent occurrence, that "the American philosopher, Professor Hare, produced an effective battery of this description, which he calls a deflagrator, from its intense heating power," and so on. (Sir William Snow Harris's *Treatise on Galvanism*, paragraphs 72 and 73).

MINING AND MINERAL STATISTICS OF GREAT BRITAIN AND IRELAND FOR THE YEAR 1884.

(Concluded from page 111.)

Tin.—The tin and iron industries are closely related. In the manufacture of the plates, about five per cent of the total iron made was consumed. The returns show :

No. of works.	Counties.	Tin plates.	Tern plates.	Black plates.	Total.	Computed weight of the whole.
90	{ Wales, 4 England, 4 Scotland, 1 }	5,267,774	1,010,622	556,306	6,834,792	349,454

In the manufacture of tin plates, about 17,000 tons of tin must have been used, while the tin produced in England was only 9700 tons, or not over 56 per cent.

We, with our enormous canned fruit trade, consume annually the product of all the mines of Great Britain, and take over one third of her exports. Important as the trade is, it must nevertheless be apparent how far from the truth are the statements as to consumption that appear in the arguments of the promoters of tin companies, some of whom apparently believe tin plates to be made of tin, instead of being merely coated by dipping. Nevertheless, as the quantity imported into the country is worth \$3,000,000, there is a great inducement to find and develop tin mines at home.

Copper.—While her tin mines maintain their outputs, the copper mines of Great Britain have fallen off in productiveness. Yet Great Britain holds the lead as the greatest copper mart of the world. Thirty-six countries in every quarter of the globe contribute their quota of ore or furnace stuff to feed her furnaces, and these same countries, and sixteen to boot, receive back their copper in manufactured form. Her imports of copper for 1884, with the exclusion of copper pyrites, are :

Ore. Tons	Regulus. Tons	Old, to be remanufactured. Tons	Unwrought and partly wrought. Tons
124,255	62,424	2,386	39,894

While her exports were :

Ore.	Unwrought bricks and pigs.	Mixed and yellow metal.	Wrought of all sorts.
11	17,924	19,331	20,686

In addition, she re-exported :

Ore.	Regulus.	Old.	Unwrought and partly wrought.
92	2,234	67	10,685

Her own mines having produced equal to 3350 tons fine, as against 2620 tons in 1883, showed a gain of 730 tons. Copper and tin mining are related, 26 of the Cornwall and Devon mines yielding both metals ; and therefore, any great activity in tin mining must affect to a certain, though practically insignificant, extent the production of copper. Another by-product from the metallurgy of copper and tin is arsenic, twenty-five mines in Devon and Cornwall yielding 9667 tons, worth £58,984. But the series of metallurgical operations most prolific in products is that through which the Spanish pyrites passes :

Year.	Ore. Tons.	Metallic copper extracted. Tons.	—Extracted by Claudet's process.	
			Gold. Ounces.	Silver. Ounces.
1883	435,156	15,370	1,911	348,210
1884	416,412	15,200	1,800	335,100

The yield of copper was therefore :

Year.	Copper.	Gold.	Silver.
1883	3.49 per cent.	9 cents per ton.	0.76 oz. per ton.
1884	3.65	8.6	0.76

In addition to the Spanish pyrites, the chemical trade consumed :

British pyrites	29,104 tons.
Pyrites from Norway and elsewhere	14,666 tons.

And this useful mineral, after yielding its copper, silver, and gold to the 22 metal extraction works in England, Scotland, and Wales, contributed as purple ore (being 75 per cent of 563,073 tons of said cuprous pyrites) 422,304 tons of iron ore to the blast and puddling-furnaces. The declared value of the imported pyrites was £1,244,871, or £2 4s. 2d. per ton.

A new feature in this year's report is, that the product is calculated not by assay, but by actual yield. The editor makes the following very valuable remarks with regard to the absurd "Cornish assay" valuation of copper ore :

"The amount of copper obtained by smelting British ores is about $\frac{1}{2}$, or 4 per cent more than the amount calculated from the dry assay. Thus, in the case of an ore containing 5 per cent of metal by dry assay, the actual yield has been taken at 5 $\frac{1}{2}$ per cent."

Lead Ore.—"The amount of lead obtainable in smelting has been reckoned as 95 per cent of the amount indicated by the dry assay. Thus, in the case of an ore containing 80 per cent of metal by dry assay, the actual yield has been taken at 76 per cent.

"In calculating the quantity of silver obtainable from lead ores, the amount of silver in ores containing less than 3 ounces of silver per ton of ore has been omitted, as in most cases it is not extracted, and it has been assumed that, on an average, one quarter of an ounce of silver remains in each ton of desilverized pig-lead."

Zinc Ore.—"The loss of zinc in smelting British ores varies from 15 to 24 per cent of the amount of metal in the ore. Due allowance has been made for this loss."

Lead.—We add a line to the table given by us last year illustrating the lead trade from 1874 :

Year.	Home production.	Imports.	Exports.	Available for home consumption.
1883	39,190	118,521	42,848	114,863
1884	40,075	132,829	37,631	135,273

As in the case of copper, England's free market draws thither lead ore and metallic lead from every lead-producing country of the world, and she re-exports it in exchange to 48 of her customers in both hemispheres.

Zinc Ore.—The zinc yielded by her own mines bears even a smaller proportion to the imported than in the case of lead :

Year.	Home production.	Imported ore.	Imported zinc.	Manufactured zinc.	Exports.
1883	13,603	45,835	40,739	20,369	11,106
1884	9,919	35,308	47,658	20,080	10,641

There would seem, therefore, to have been increased activity in the home consumption, though a falling off in the home production,

Manganese.—The most noteworthy feature in the manganese statistics is the falling off in importations from this country, which were in—

1883	3135 tons ; value, £12,857
1884	567 tons ; value, 2,122

Italy and France also exhibit a remarkable deficit ; but these shortcomings are more than counterbalanced by greatly increased imports, especially from Spain and Russia, so that the total was—

1883	22,362 tons ; value, £82,314
1884	26,048 tons ; value, 75,435

For the first time is added a table showing the mineral production of the British colonies. From this we glean some of the figures of greatest interest to American miners.

PRODUCTION OF COAL, COPPER, GOLD, AND SILVER IN THE BRITISH COLONIES. Mineral Substances Produced.

BRITISH COLONIES AND POSSESSIONS.	Coal.		Copper ore.		Gold.		Silver.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Africa :								
Cape of Good Hope	19,966	55,956	22,705	454,113				
*Gold Coast					17,497	61,552		
*Natal	5,000	1,000						
Australasia :								
New South Wales	2,521,457	1,201,942	Ore, 85 Metal, 3,873	577,201	123,805	458,506	77,065	16,488
Queensland	104,269	44,927	1,800	21,080	212,783	744,740		
South Australia			Ore, 18,687 Metal, 3,398	375,325	2,071	10,534		
Victoria	428	599	381	4,271	740,253	3,121,012	22,122	5,530
Western Australia			5	75				
New Zealand	421,764	316,323			248,374	908,352	16,826	3,785
*Tasmania	8,805	6,228			49,122	187,337		
Asia :								
*India	1,130,242	565,121			390	1,534		
N. America :								
Dominion of Canada	1,846,487	672,035	4,452	22,260	23,096	216,719	Ore, tons, 100	2,900
Newfoundland			12,352	51,359				
Totals	5,858,406	2,864,131	Ore, 60,477 Metal, 12,271	1,505,684	1,487,591	5,795,289	Oz., 116,013 Tons ore, 100	28,703

* For the year 1882. The other statistics are for 1883.

The largest single item of value is diamonds, of which the Cape Colony exported a recorded amount of 1,830,935 carats, valued at £2,742,470.

THE NEW SOUTHWESTERN PENNSYLVANIA RAILROAD AND ITS COAL BUSINESS.

A representative of the Philadelphia *Inquirer* recently made an examination of the Beech Creek, Clearfield & Southwestern Railroad and the industries upon its line. From his description, we glean the following :

The railroad extends from Jersey Shore, sixteen miles west of Williamsport, to Phillipsburg, Pa., about seventy-five miles. The line is mostly constructed along the banks of streams, and is very crooked. There is a branch road starting seven miles east of Phillipsburg, about forty-one miles to Gazzam. At Woodland, about half-way between Munson's Mill and Gazzam, a branch about four miles long extends to the town of Clearfield. There are, besides, numerous laterals extending to the mines and saw-mills that ship their products over the road.

The road-bed is particularly well made and laid with 78-pound steel rails. The greatest grade on the main line is 52 feet to the mile, which occurs in only two places, and for a short distance. On the Gazzam branch, there is a 90-foot grade. There are one or two 12-degree curves on the line. On the Tyrone & Clearfield branch of the Pennsylvania road, there are 18-degree curves and grades of 160 feet to the mile. It requires five engines to haul forty loaded cars from Osceola to the summit ; while on the Beech Creek road, one engine will haul the same load from the mines to the end of the line.

If the Pennsylvania secures control of the Beech Creek road, as now seems probable, it would connect it with the Philadelphia & Erie road. At present, the haul to Philadelphia and New York would be about forty miles greater than by the Tyrone & Clearfield road ; but the easier grades, better road-bed, and curves would make it the most desirable line for use.

Next summer, however, the Schuylkill Valley line will be completed, and a connection be made through to Sunbury. This done, the great advantage of the Beech Creek road will be observable, as it will then be by far the shortest line to tide-water, and will relieve the main line of the Pennsylvania.

THE CLEARFIELD BITUMINOUS COAL COMPANY AND OTHER OPERATORS.

This is a ring within a ring. The stock of the company is held by the stockholders of the railroad company. The company owns about 33,000 acres of coal land, of which 23,000 are at Peale and 10,000 at Gazzam. Peale, the head-quarters of the company, is 16 miles east of Phillipsburg and 57 miles west of Jersey Shore.

At Gazzam, there are two or three openings, but only one is worked, which produces about 200 tons of coal a day. At Peale, there are seven drifts, three at the Grassflat mines and four at the Tunnel mines. The output of these seven openings is about 1500 tons a day. The coal-veins vary from three to six feet in thickness. The "B" vein is worked at Peale, and is little less than six feet thick. The full thickness, however, is not mined, the bottom being left in the mine.

The individual operators on the line of the road are Ario Pardee, Empire Coal Company, Duncan & Lingle, and R. B. Wigton & Co. These four ship about 800 tons a day.

The present business of the road is as follows :

	Cars.	Tons.
Peale mines	70	1,500
Gazzam mines	10	200
Individual operators	40	800
	120	2,500

This quantity can be greatly increased on short notice. The road also has a good timber business.

too lax a condition of the rods may permit the entire falling-in of the arch, while the contrary fault may cause a positive buckling and elevation of the same, accompanied with a general cracking and distortion of the lateral walls. The latter accident, in a moderate degree, is much more likely to occur than the former, owing to the natural tendency to overdo a measure essential to safety, and yet not exactly defined.

The lateral rods should be tightened until they begin, when struck near the center with a hammer, to vibrate rapidly, and to be but little depressed when stepped upon. (It is almost needless to say that none of the upper rods should touch the arch.) A simultaneous examination of the brick-work forming the upper portion of the side walls should also be made, as it is here that the effect of the curving of the buckstaff from too great tension, and consequent pressure against the mason-work, is first visible.

The extreme limit of tension is reached when the first signs of this appear, as nothing can be gained by bending the uprights, and if the latter are sufficiently strong and applied in the numbers shown in the illus-

trations enumerated have been carefully observed, this can never occur.

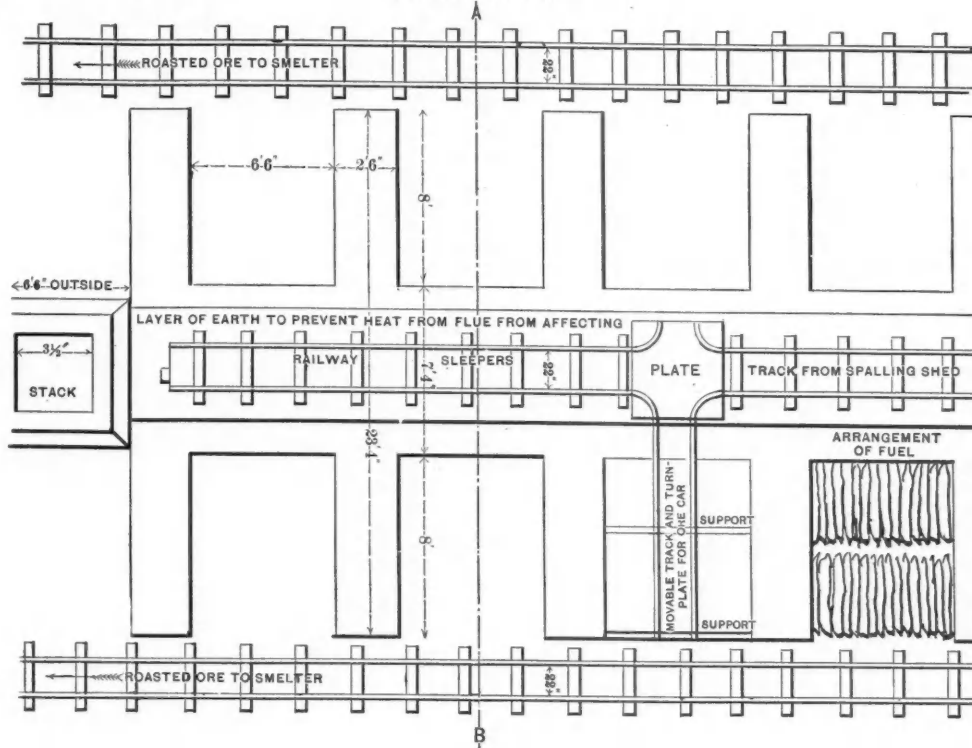
The length of time the completed furnace may now stand untouched with advantage to the mason-work is only limited by the requirements of the business, which almost invariably require its being put in commission at the earliest possible moment. Under such circumstances, a smoldering fire of large logs, knots, or any slow-burning waste material should at first be kindled on the floor of the ash-pit, the grate-bars not being put in place until the masonry surrounding the fire-place is partially dried.

In twelve or eighteen hours, the fire is elevated to its proper place, and with a nearly closed ash-pit door and partially lowered damper, the process of drying proceeds gently and without that violent generation of steam and vapor that is sure to be accompanied by extensive fissuring of the brick-work and permanent weakening of the entire structure.

A most careful and repeated examination of the condition of tie-rods and buckstaves should be made every twelve hours from the first

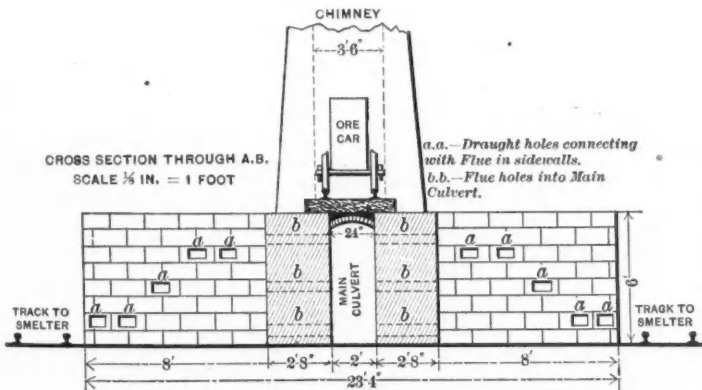
ROAST STALLS FOR ORE.

SCALE 1/2 IN. = 1 FOOT



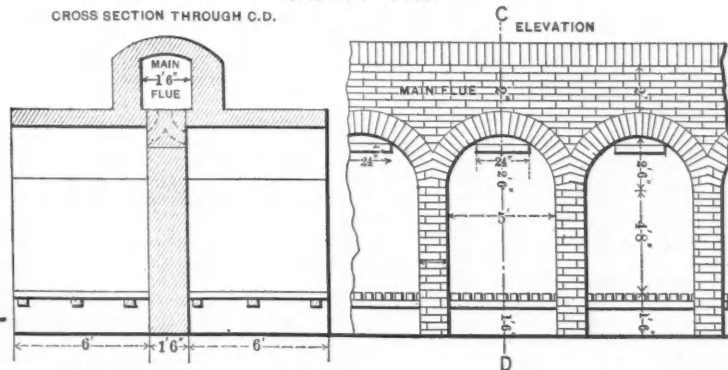
ROAST STALLS FOR ORE.

CROSS SECTION THROUGH A.B.
SCALE 1/2 IN. = 1 FOOT



ROAST STALLS FOR COPPER MATTE.

SCALE 1/2 IN. = 1 FOOT



(See pages 2 and 3, July 4th, 1885.)

tration, the arch may be considered perfectly supported. All the rods should be tightened to about the same extent, although it must be remembered that the great length of the longitudinal rods may prove deceptive in estimating their tension, it being impossible to tighten them to such a degree as the shorter lateral ones.

A single additional precaution is recommended, though seldom practiced by builders. This consists in breaking up a few thin roofing slates into fragments a couple of inches in length, and driving these with moderate force into whatever crevices may still be found in the surface of the arch.

Some 20 or 30 pails of liquid mud are now poured over the arch, and the process repeated as it dries, until every crack and crevice is filled, and the roof rendered completely solid and air-tight.

The wooden center on which the arch was built should now be removed by first knocking away the little posts that support it, using a light stick of timber as a battering-ram, and proceeding from one side door to the next until every stick and batten is removed. They should be stored for future use. Any indications of settling on the part of the arch must be immediately counteracted by tightening the tie-rods; but when the pre-

kindling of the fire until the furnace has attained its full heat and may be supposed to have expanded to its utmost limits, although it may be a month or more before all evidences of movement cease. The first indications of this process will be seen in the neighborhood of the bridge and fire-place, where the highest temperature prevails. A bending of the buckstaves combined with a pressing in of the skewback line and an increased tension of the cross-rods are warnings that may soon be followed by either a complete giving way of some portion of the iron-work, or more frequently by a bodily upheaval of the arch and general fissuring of the brick-work, unless relieved by diminishing the strain to a corresponding degree. This process of loosening must be extended to the entire iron-work of the furnace, and continued as long as necessary, the tension being again increased if the furnace is ever allowed to cool down to any considerable degree—an operation more destructive to it than many months of ordinary wear.

While the apparatus is thus gradually being brought into proper heat, the sheet-iron hopper should be suspended from timbers resting upon the trussed beams of the building. It should be strongly constructed and well braced, and provided with a stout lever, easily accessible to the

operator when standing upon the floor of the building. A track running transversely to the row of calcining-furnaces, and parallel with the longitudinal axis of the building, renders these hoppers easily accessible to the car in which each weighed charge of ore is brought. The car is provided with a dumping arrangement, so that it easily and completely empties itself into the furnace hopper. The laborer who weighs and transports the charges can supply six furnaces, provided every thing is arranged as herein described, or in a similarly judicious manner.

The outfit of tools may also now be prepared, and should consist for each 4-hearth calciner, of 6 rabbles, 4 inches by 10 inches and 12 feet long; 6 paddles, 8 inches by 12 inches and 12 feet long; 4 door hooks, to handle the sheet-iron working door; 1 long, hooked, and pointed iron poker for wood, or an ordinary coal poker, if coal is used; 2 ordinary long-handled square-pointed shovels; 1 scoop-shovel (for coal).

The iron rollers, usually employed as rests for the long tools at each working door, soon lose their shape and cease to revolve. It is better, therefore, to provide merely a smooth iron bar, which, if kept well soaped, renders the handling of the tools as easy as any of the more expensive devices.

(TO BE CONTINUED.)

PROPERTIES OF MALLEABLE IRON DEDUCED FROM ITS MICROSCOPIIC STRUCTURE.*

(Continued from page 112.)

If pressure is exerted on an individual grain in the direction of but one axis, as occurs, for example, when a piece of iron is hammered on an anvil, there is formed from the round or, more correctly speaking, many-sided grain, bounded by pentagonal planes, a plate technically known as "scale" (Schuppe). If, on the other hand, the pressure acts in the direction of two axes, either at the same time, as in the case of rolling with a diagonal groove, or at different times, as in the case of hammering an ingot or rolling a bar, turning it around 90 degrees after every passage through the rolls, the grain is converted into a column, which belongs apparently to the tetragonal system, and which is, in practice, termed a "fiber" (Sehne). Fibers are thus elongated grains. Confirmation of this assertion may be obtained under the microscope with sections cut from rough and worked pieces of iron, partly parallel, partly at right angles to the plane of pressure. The phenomena are, for reasons that are explained below, most distinct in the case of quite soft weld iron rich in slag. In sections parallel with the fibers, the separate columns may be very clearly followed, while in sections at right angles to the fibers, no elongation is noticeable. This fact explains why a fracture at right angles to the fibers appears granular to the naked eye. A fiber can not, however, extend in any possible length without again breaking up when given conditions are brought into play. The percentage of carbon has the greatest influence on this phenomenon. If the percentage reaches or exceeds 0.5, the fibers split up into grains, even with slight stretching. The same effect is produced also with a low percentage of carbon by a very small amount of phosphorus, a large amount of silicon, or a not inconsiderable amount of sulphur.

Under such circumstances, the fibers on being stretched split up into grains, which must always be smaller than the grains from which they originated. This phenomenon is better shown under the magnifying-glass than under the microscope, as the field of the latter is not large enough to show several grains at the same time if they are not very minute. The fact that steels rich in carbon, and finely granular iron (Feinkornisen), form no fibers, is well known in practice. The formation of grains by phosphorus is so characteristic that it is employed for detecting very small amounts of this element in basic Bessemer iron. Moreover, this fact shows that from a fibrous iron a coarsely granular iron can not be formed by any influence with the exception of elevated temperature. The theory of a conversion of this kind by means of faint concussions must consequently be relegated to the domain of fable. The fracture of a fibrous iron can only exhibit a grain equal to the section of fibers, or a finer grain when, through concussion, an elongation has been effected. This is confirmed, I may add, by the experiments of Wöhler and Spangenberg.

Although iron poor in carbon is alone adapted for the formation of fibers, yet every iron poor in carbon, when compressed in the direction of two axes, does not form fibers. It is a known fact that weld iron, during the rolling process, very easily forms fibers, but that ingot iron very rarely does so. The reasons for this remarkable phenomenon are also explained by means of the microscope. Microscopic examination of sections of fibrous iron parallel with the direction of the fibers shows that the individual fibers form wires that lie parallel to one another. But they never, even in the case of the softest weld iron, have a very long extension, but always give place to new fiber-heads, which rarely lie in the same direction, being generally more or less displaced, though always parallel. From this it may be concluded that the strength of fibrous iron depends on the fact that, like the individual hemp fibers in a rope, the fibers lie with their ends in various sections. The microscope shows further that none of these wires or fibers is directly connected with its neighbors, either in a lateral or longitudinal direction. In fact, each fiber may, by careful etching, be picked out like those of a muscle of the human body. On examining into the cause of the separation of a fiber from those immediately surrounding it, a separating intermediate layer is composed of slag or iron scale (Fe_2O_4). These intermediate layers accompany the fibers, in every case, as far as their ends, and there surround the fiber-heads as a very fine envelope, either joining the following fibers or undergoing a short disconnection. In the latter case, a granular structure immediately occurs at the point in question, that is to say, an agglomerate of crystals may be seen, which are shifted toward one another and intimately entangled.

This latter phenomenon is so frequently the rule that, with a small field and a high power, and with a section parallel with the fibers, the observer imagines he is looking at a granular iron, while with even a slight shifting of the object in a longitudinal direction, the elongated crystals again appear as fibers. Just as this phenomenon of grain formation between the fibers only occurs when no separating slag envelope is present, in the same way in the formation of fibers the slag envelope

is never wanting. From this, it must be concluded that the formation of fibers does not take place without the admixture of slag. Proof of this is afforded by the results obtained with the Bessemer process on a small scale at Avesta, in Sweden, where a perfectly fibrous ingot iron was produced in the Bessemer process by an intentional admixture of slag. Further proof is afforded by the tests to determine whether the iron in the basic process is free from phosphorus. The iron that is ladled out for the test is mixed with slag, and consequently, when under the hammer, the formation of fibers is effected, which gives a silk-like structure to pure iron, in contradistinction to iron containing phosphorus, which remains crystalline. By this means, it may very easily be seen whether the iron is free from phosphorus. Moreover, the microscope shows that the slag portions in fibrous iron are intimately mixed with the iron, since, even within the separate fiber skeins, portions of slag may, with a sufficiently high magnifying power, be always discovered. Varieties of iron that are very free from slag, as, for example, crucible cast-steel, are hence the most averse to the formation of fibers.

While, under the microscope, weld iron is very suitable for the study of the formation of fibers, it is, on account of the slag mixed with it, unsuitable for the investigation of the grains and the individual iron crystals. For the latter, ingot iron alone is quite suitable. In the microscopic examination of the various varieties of iron, the only variety appearing approximately homogeneous and composed of grains of the same size is crucible cast-steel that has cooled comparatively quickly. In all other varieties, even in test pieces from large and therefore slowly set ingots of cast-steel, on etching the thin section, two different varieties of iron are exhibited, one of which is interstratified in the other, by which it is in a manner surrounded, so that the smooth-cut plane of fracture acquires a porphyritic appearance. The closer the iron approaches to raw iron, that is to say, to the original state in which it was produced, the more distinctly do the two kinds of iron separate from each other, and exhibit a net-work inclosing angular bodies. In the following portion of my paper, the angular inclusions are termed crystalline iron, while for the iron forming the net-work the term homogeneous iron is reserved, merely for the sake of clearness and brevity. The form of the crystalline iron bodies is that of regular polygons, only in the interior of iron ingots that have cooled uniformly. In other cases, the crystalline iron bodies are, as a rule, extended in one direction, and this longer axis is at right angles to the cooling surface in the case of iron simply set, and not submitted to any subsequent treatment. In the case of pieces of worked iron, on the other hand, it follows the course of the homogeneous iron portions, or corresponds to the axis that is not compressed—generally the longitudinal one. Bodies of this kind often occur together, and thus give rise to forms resembling letters and apparently quite irregular. These forms, however, under a sufficiently high power, may always be further split up, exhibiting the manner in which they are formed of single regular bodies. The crystalline iron bodies occur the more frequently, but, at the same time, of smaller dimensions, the more closely the proportion of carbon approaches the limit of two per cent. In soft iron, low in carbon, they are often widely separated from one another, but are of considerable size. The crystalline iron bodies of the latter kind appear to consist again of various parts. The impurer the iron investigated, the more they exhibit surfaces not unlike that of checkered cloth. On the other hand, the homogeneous iron forming the net-work is very uniform, even when seen under a very high magnifying power.

(TO BE CONCLUDED.)

Austrian Fire-Damp Commission.—Berghauptmann Joseph Fleischhaus, of Vienna, has been appointed by the Austrian government president of a permanent commission for investigation into the causes of fire-damp explosions in collieries, their ventilation, the use of gunpowder in blasting, and other causes leading to the loss of human life in mining.

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 JUNE 30TH.

- 320,905 Clay-Crushing Machine. Frank Aisp and Chester T. Drake, Chicago, Ill.
 320,907 Pipe-Coupling. Hiram R. Borie, Philadelphia, Pa., Assignor of one half to Stephen E. M. Tasker, same place.
 320,908 Smelting Ores. Mathew D. Brett, Denver, Colo., Assignor of one fourth to d'Estaing S. Covert, same place.
 320,937 Dry-Ore Amalgamator. Henry Kappner, Elizabeth, Colo.
 320,942 Stone-Dressing Machine. Jonathan Mann, Milton, Mass.
 320,966 Metal Drill. Francis H. Richards, Springfield, Mass., Assignor to J. D. Cox, Jr., and F. F. Prentiss, both of Cleveland, Ohio.
 320,967 Manufacture of Metal Drills. Francis H. Richards, Springfield, Mass., Assignor to J. D. Cox, Jr., and F. F. Prentiss, both of Cleveland, Ohio.
 320,968 Machine for Making Twist-Drills. Francis H. Richards, Cleveland, Ohio, Assignor to J. D. Cox, Jr., and F. F. Prentiss, both of same place.
 320,969 Machine for Making Twist-Drills. Francis H. Richards, Cleveland, Ohio, Assignor to J. D. Cox, Jr., and F. F. Prentiss, both of same place.
 320,973 Rolling-Mill Hooking and Carrying Machine. Louis S. Saylor, Indianapolis, Ind., Assignor of two thirds to Jackson Saylor and John Thomas, both of same place.
 320,981 Pipe. James Steel, Memphis, Tenn., Assignor of one half to George Mahan, same place.
 320,998 Ore Separator and Concentrator. Joseph Behm, San José, Cal.
 321,003 Ore-Roasting Furnace. William Brückner, San Francisco, Cal.
 321,024 Dumping-Car. J. M. Hartman, Philadelphia, Pa.
 321,034 Coal-Drilling Machine. James T. Johnson and Thomas Thompson, What Cheer, Iowa.
 321,102 Roll for Re-rolling Old Rails. William H. Graham, Pittsburg, and Allan C. Milliken, Millvale, Pa.
 321,103 Coal-Mining Machine. Jonathan W. Harrison, Ypsilanti, Assignor of one half to Charles R. Miller, Adrian, Mich.
 321,118 Ore Separating and Concentrating Machine. Henry Landrin, Anglet, Basses-Pyrénées, France, Assignor to David Block, San Francisco, Cal.
 321,120 Art of Manufacturing Portland Cement. Robert W. Lesley and David Griffith, Egypt, Pa., Assignors to the Pennsylvania Patent Right Company, same place.
 321,144 Twist-Drill. Albert Söderström, Stockholm, Sweden.
 321,196 Drilling-Machine. Ulrich Eberhardt and Henry E. Eberhardt, Newark, New Jersey.
 321,311 Metallurgical Furnace. Samuel T. Owens, Pittsburg, Pa.
 321,341 Process of Making Sodium Sulphite. Eustace Carey, Holbrook, Gaskell, Jr., and Ferdinand Hurter, Widnes, County of Lancaster, England.
 321,347 Manufacture of Salt. Joseph M. Duncan, Warsaw, New York.

* A paper read before the Iron and Steel Institute by Dr. Wedding.

FURNACE, MILL, AND FACTORY.

The Buell Electric and Pneumatic Company has been incorporated in this city, with a capital of \$10,000, by José F. de Navarro, Robert Bliss, John J. McCook, James Clyne, and Narcisso Villaverde.

Work will be begun on the new rolling-mill of W. H. Everson & Co., at Scottsdale, Pa., within the next three weeks.

The work of repairing the Vulcan Steel-Works at St. Louis, Mo., has been rapidly pushed forward under the new management, and the furnaces will probably be in full blast by September 1st. The company has been admitted to the association that controls the Bessemer steel patents in this country, and will manufacture Bessemer steel rails.

The new works of Chess, Cook & Co. at Homestead, Pa., for the manufacture of steel nails, are hurrying with all possible dispatch. The contract for the power has been let to the Westinghouse, Church, Kerr Co., of New York City.

Park, Brother & Co., of the Black Diamond Steel-Works, Pittsburg, Pa., are constructing a steel-melting furnace that will have a capacity of 30 tons.

The machine-works of Robinson, Rea & Co., Pittsburg, Pa., will be in operation about September 1st.

William Swindell & Brother, Pittsburg, Pa., are remodeling a ten-pot window-glass furnace, making it a regenerative gas furnace, for the works of R. C. Schmertz, of Belle Vernon. The regenerators, which are for the use of natural gas, are built in a cave. Messrs. Swindell & Brother are also converting a coal furnace into a reversible gas furnace, which, when completed, will, it is said, be the first one in use erected on this principle.

Messrs. D. W. C. Carroll & Co., Limited, of the Fort Pitt Iron-Works, Pittsburg, have just closed with Messrs. Shoenberger & Co. for the building of two immense cupolas, blast-pipes, stacks, etc., for their new Bessemer plant, and with Messrs. Jones & Laughlins for twelve steel ladles for their new Bessemer plant, together with all appurtenances—trunnions, tilter, etc.

The Detroit (Mich.) Brass and Copper Rolling-Mill Company has contracted to furnish 17,000 pounds of sheet-copper for the new gutters and down-spouts for the Illinois State House at 13½ cents, delivered in Springfield.

The Standard Charcoal Company, Centreville, Tenn., manufacturer of alcohol from wood, will erect an iron furnace to use the gas arising from distillation of alcohol in the manufacture of pig-iron.

It is stated that orders have constantly increased, and consequently the facilities of the New Castle, Ohio, sheet mill have become inadequate. Arrangements are making with the Brown heirs for the leasing of the sheet mill department of their mill. This, if consummated, will not interfere with the proposed scheme of the Youngstown parties who were after the nail department.

The five remaining furnaces in the plate mill of the Pottstown Iron Company, at Pottstown, Pa., which have been idle some time, started up on the 17th inst. Arrangements are also making to put the new Universal mill in operation.

The Armstrong Concentrating and Amalgamating Machine Company has been incorporated. The incorporators are George S. Armstrong, William E. Curron, John Kiefer, William G. Hutchinson, and John D. Stickfort. The objects of the company are, to manufacture and sell the Armstrong amalgamator. The capital stock is \$20,000, and the principal place of business and office is to be at Denver, Colo.

All the mills in the Mahoning Valley, Ohio, have now signed the scale, and work was resumed on the 18th inst.

One hundred cases of Remington rifles and 100 cases of cartridges for the government of Honduras have been sent from New Orleans.

A new steel converter of one ton capacity has just been finished at the Scott foundry, at Reading, Pa., and was shipped to the E. & G. Brooke Iron Company, Birdsboro', where experiments will be made. If the experiments prove successful, the Brooke Iron Company intends to engage largely in the manufacture of steel nails. Large converters will be built, and it is said that extensive steel-works will be built at Birdsboro', and the product be used not only by the company for the manufacture of nails, but to place the ingots in market to sell to manufacturers throughout the country.

At the Vulcan furnace, Michigan, the Mathieu retorts have been nearly all taken out and the chemical works run in connection with them torn down, to make way for fifty charcoal kilns, thirty-four of which are already built. Each kiln is charged with wood as it is constructed, and is ready to be fired when finished. The superintendent in charge calculates that the fifty kilns will supply all the charcoal needed to run the furnace, and estimates that a saving of at least two dollars a ton on the pig-iron made will be effected by the substitution of the old method of manufacturing charcoal for the retort system. The intention is to put the furnace again in blast in the course of a month or so, by which time it is expected that the changes and repairs in progress will be completed.

LABOR AND WAGES.

It is stated that the Lexington (Mo.) Coal Mining Company surprised its miners the other day by notifying them that there would be an increase of pay of 7½ cents a ton for digging coal. After September 1st, there will be a further advance of a like amount.

The coal miners of the Massillon District of the Tuscarawas Valley, Ohio, have been called to meet in convention at Massillon on the 21st inst. to reconsider, it is supposed, their decision to strike against the proposed reduction of 15 cents a ton.

Some of the Cleveland (Ohio) rolling-mill strikers have shown signs of late of being weak-kneed, and the leaders have been trying to keep them in line. They aver that the iron trade has taken a boom, and that the rolling-mill company is anxious to resume work. On the 20th inst., judges and clerks were appointed, and about half the best-skilled strikers filed past and voted for returning or not returning to work. The vote stood 1040 for holding out for the Amalgamated Association prices, while forty-one voted to return to work. They then drew up a scale of wages, which they presented to the manager of the rolling-mills.

A convention of coal miners will be held in Monongahela City, Pa., the 25th inst., to establish a uniform rate of wages in the river mines.

Ellis & Lessig, of Pottstown, Pa., have informed their heaters, helpers, rollers, and others working about the rolls in their mills, that their wages will be increased, the increase in some cases reaching as much as 20 per cent, with the prospect of the mill going on double time, and plenty of work.

Lentz, Lilly & Co., who operate the Park Place and Nanton collieries at Pottsville, Pa., have closed their collieries, owing to a strike of the miners.

The miners at the mines of the Warrior Coal and Coke Company at Birmingham, Ala., went out on strike on the 15th inst. The strikers, who objected to the employment of Italian labor, are stubbornly holding out, while twenty-three new-comers are in jail in default of bond, on the charge of carrying concealed weapons and firing pistols in public. The regular miners are the prosecutors. The foreigners were to have a hearing on the 17th. Meantime, the miners say that they will quit work the moment foreign labor is introduced, and will permit none but themselves to work the mine. The company is equally determined.

TRANSPORTATION NOTES.

Mr. W. W. Hungerford, chief-engineer of the Honduras Central Railroad, has just returned from Truxillo, having made a survey of the railroad from Truxillo to Juiticalpa, the capital of the Department of Olancho, a distance of 200 miles. The concession for the construction of this road was granted by the Honduras government a short time ago to a New York syndicate, with Colonel M. L. Aguilera at the head. Honduras is at present without any railroad and even without wagon roads. Mr. Hungerford thinks that the construction of a railroad will aid greatly in developing the resources of the country. The country is rich in minerals, particularly gold, silver, and copper, but the mines have been only partly developed. Mr. Hungerford has completed the surveys from Truxillo, on the Caribbean Sea, through the central portion of the republic, and the line is to be run through as soon as possible to the Bay of Tosaca, on the Pacific. Juiticalpa, to which point the road has been surveyed, is about midway between the two oceans. Rails and other materials for the construction of the new road will be purchased as soon as Mr. Hungerford gets back to the East, and will be shipped from New Orleans to Truxillo by steamers, the distance between the two points being 800 miles.

COAL TRADE NOTES.

MEXICO.

Mr. Santiago Ainsa, attorney in fact of the Compañía Exp. lotadora de Torrenos Carboníferos in Sonora, denies the report that the English company that bought the Trinidad and Bronces mines in Sonora is the owner of the coal-fields for about twenty-eight miles in and around the Bronces mine. These anthracite coalbeds extend west to San Marcial, to within twenty miles from the Guaymas Railroad. The above company only owns one and a half leagues of coal lands, that is, about seven thousand acres, in the heart of the mountains, in almost impracticable routes for railroads, and all the rest of the coalbeds are owned by a regular concession granted to the Compañía Explotadora de Torrenos Carboníferos in Sonora, whose domain extends over three million acres of land; and while it is true in regard to the veins, the report of the Trinidad people is incorrect that it owns more than is above specified, and all other reports are calculated to deceive the public.

PENNSYLVANIA.

ANTHRACITE.

It is stated that the colliery at Wyoming, formerly owned by the Fuller Coal Company, has been sold recently to the Delaware, Lackawanna & Western Coal Company at sheriff's sale.

The coroner's jury investigating the disaster in the West End Coal Company's mine at Macanaqua returned a verdict charging that the victims came to their death through the criminal negligence of Christian Conrad, the foreman. Under the new mine law, it now becomes the duty of Mine Inspector Williams to return a certified copy of this verdict to the judges of the courts, who will summon Conrad before them, and if, on investigation, they believe there was negligence or violation of the law, he will be held for trial.

TENNESSEE.

Mr. Joseph C. Guild, of Nashville, has recently been appointed State Inspector of Mines for Tennessee. In 1881, a law was enacted creating the office and defining the duties to be, the filing of maps of coal mines, the inspection and supervision of the drainage and ventilation of mines, and the safety and efficiency of the machinery and construction in and about coal mines. No regular appointment had before been made, although several inspections have been made by other officials of the Bureau of Mines, of which A. J. McWhirter is Commissioner. Mr. Guild won the appointment just made in a competitive examination, the first ever held for a State office in Tennessee.

GAS AND PETROLEUM NOTES.

Exports of refined, crude, and naphtha from the following ports, January 1st to August 15th:

	1885.	1884.
	Gallons.	Gallons.
From Boston.....	6,232,983	3,566,133
Philadelphia.....	87,775,572	48,128,684
Baltimore.....	6,503,915	7,539,266
New York.....	226,899,556	232,266,446
Total exports	327,412,026	291,500,529

CANADA.

PROVINCE OF QUEBEC.

The company that is boring for oil three miles south-east of St. Grégoire has reached 210 feet. Several gallons have been pumped up with the borings.

OHIO.

According to press dispatches, a committee of an association comprising all the iron mill owners of Cincinnati, having returned from a visit to Pittsburg to inspect the operation of natural gas in cheapening the production of iron, has made a report that it will be next to impossible to compete with Pittsburg without the use of natural gas. Therefore, an agreement has been made to share the expense of boring for gas at one of the Cincinnati mills, and if successful, to continue sinking wells till all the mills are provided at their common expense.

Another vein of gas has been struck at Findlay at a depth of 12,000 feet. This makes six wells in Findlay. Two more wells will be drilled this season.

PENNSYLVANIA.

It is reported that a company is forming at Pittsburg to manufacture and sell, on a large scale, water-fuel gas on the Dawson (English) principle. It is said it can be done profitably at 5 cents a thousand feet, while the gas can be carbonized for illuminating pur-

poses and sold at 8 cents a thousand feet. Full details as to capitalization, etc., have not been settled.

A strong effort is making among prominent oil men to raise the necessary funds toward building a monument to the memory of Colonel E. L. Drake, the discoverer of oil in 1859, within a mile of Titusville. The proposition is to collect enough to build a lasting tribute either on the spot where the first well was sunk, on the flats below the city, or on the public square in Titusville.

Dr. David Hostetter concluded the negotiations on the 15th inst. whereby he becomes the sole owner of the Fuel, Gas, and Pennsylvania Fuel companies, which were recently consolidated, and which constitute a natural-gas plant worth, it is stated, over \$1,000,000. The amount of the purchase is estimated at \$500,000. Dr. Hostetter, it is now reported, is trying to purchase a majority of the stock in the Philadelphia company, for the purpose of consolidating this company with the Pennsylvania Fuel Company. The stock of the former company was bought up rapidly on the 18th inst. at from 49 to 51. It is said that Hostetter has been quietly absorbing the stock for some time. The control of the company is in the hands of George Westinghouse, Jr. Mr. Carnegie has stock worth \$200,000, and William Shaw and John McCullough hold a large block as collateral for a loan to Mr. Westinghouse. Of the \$5,000,000 of capital stock, \$1,500,000 has been issued, and it is probable it would take \$1,500,000 to buy a control of this and the patents held by the company.

WYOMING.

The Wyoming Land, Oil, and Transportation Company at Lander has shafting in position, and is beginning operations on the top of Beaver Mountain. The company has been for the past two months engaged in hauling the heavy timbers for the shaftings a distance of sixty miles. The second shaft at Dallas records 230 feet. Work is suspended there until the Beaver Mountain claim is developed. A pipe line from Dallas to Point of Rocks is talked of as the means of getting the oil to the railroad.

GENERAL MINING NEWS.

ARIZONA.

COCHISE COUNTY.

COPPER QUEEN.—The special meeting of this company, called for next week, is, we understand, to arrange a consolidation with the Atlantic property adjoining, with which there has for some time past been a dispute threatening a lawsuit. This arrangement will undoubtedly be advantageous to the Queen, and considerably increase the quantity of its rich ore-reserves.

CALIFORNIA.

We are informed by Messrs. John Taylor & Co., large dealers in mining goods at San Francisco, that, as indicated by increased demand for supplies, gold quartz mining is looking up in California. Old mines that were abandoned twenty years or more ago are now sought after and taken up, and by improved machinery and appliances in saving gold, and reduction in expenses generally, are now worked with profit. Many new and important discoveries have recently been made.

MONO COUNTY—BODIE DISTRICT.

STANDARD CONSOLIDATED.—During the week ended the 10th, the 300-level south drift has been cleaned and retimbered for 30 feet from the station. The ore-bodies average fully as well as by the report of August 1st. Owing to the accumulation of ore at the mill, the tramway was run but five days, delivering 406 tons. The mill is running steadily and well.

PLACER COUNTY.

MINES DE GOLDEN RIVER.—M. de la Bouglise has arrived at the mines, and active development-work has begun.

SAN BERNARDINO COUNTY.

BONANZA KING.—The ten-stamp mill was burned to the ground July 31st. The fire originated from the dry-kiln, a spark having flown out of the furnace-door igniting some cedar bark that caught the east side of the building; the building, being very dry, took the flames at once. It is stated that this mill with its surroundings cost the company over \$100,000. It is thought that the work of erecting a new mill will begin soon, and that its capacity will be greater than the one destroyed. Mr. Wilson Waddingham, of New York City, connected with this company, has arrived at Providence,

COLORADO.

CUSTER COUNTY.

BASSICK.—The sale of the property of this company on attachments began on the 10th inst. at Querida. The pump, powder, and some other movable property has been sold; but the sale of the personal property was not finished, and was to be continued on the 12th inst. Mr. White, one of the stockholders of the company, is here trying to effect the purchase of judgments against the mill at 85 cents on the dollar, and a few parties have agreed to sell at that, but most of the creditors say they will have 100 cents or nothing. There is considerable feeling and bad blood, though the men are quiet. There may be serious trouble before the matter is finally wound up.

TERRIBLE.—Messrs. Taylor & Brunton, mining engineers, have finished their professional work at this mine, and state that it is running 125 tons a day. They report the mine 80 feet in width, 15 per cent lead as cerussite.

DOLORES COUNTY.

RICO REDUCTION COMPANY.—The company announces that it is ready to receive and purchase all ores offered that are suited to its two modes of treatment, amalgamation and lixiviation.

GILPIN COUNTY.

SMITH & PARMLEE.—This 40-stamp mill will start up on the 10th inst. for the treatment of custom ore.

GUNNISON COUNTY.

According to local papers, Mr. Levi Moffet has succeeded in his attempt to raise money to start up the smelter at Gunnison, and place it on a sure footing and to purchase ore. A new furnace will at once be built and work will start up at an early day.

LAKE COUNTY.

A number of Chicago parties are exhibiting considerable interest in the prospective value of the territory covered by the St. Louis and Thomas Starr placers, embracing about sixty-five acres of territory at the foot of Harrison avenue. The gentlemen, who have personally examined the ground, express great confidence in the existence of a productive contact below the city of Leadville, and seemingly are willing to expend quite a sum of money in determining the question.

CLEAR GRIT.—The developments consist of a shaft 102 feet in depth, with levels running north and south, about fifty feet each way, and several rises from thirty to sixty feet in height from the south level. The ore is of medium and low grade—from three to sixty ounces—in streaks from a few inches to eight and ten feet. The mineral consists of zinc-blende, galena, and iron pyrites, while the gangue is decomposed porphyry and quartzite. The silver is in the ore as sulphurets and brittle, ruby, and native silver. Assays of from 200 to 5000 ounces to the ton are not unusual, but such grades of mineral are not encountered in large quantities. Quite a little pocket of about 200-ounce stuff was met with a short distance north of the shaft, but it did not hold out very long. The north level again shows some improvement.

EVENING AND MORNING STAR.—The Evening Star during July shipped 1397 tons of iron ore and 142 tons of lead ore, making a total of 1539 tons. The Morning Star consolidation during the same period shipped 596 tons of iron ore and 494 tons of lead ore; total, 1090 tons. The concentrating mill at the Upper Waterloo furnishes a considerable quantity of concentrates, carrying forty per cent in lead and over, which is made from the low-grade ore in the mine. Heretofore, the mill has been running during the day only, but arrangements have been made to keep it at work at night as well. Parts of the old works that were operated long ago, the drifts having caved in, are retimbering for the purpose of mining the low-grade material to be treated in the mill. This concentrating mill is doing most satisfactory work. A new ore-body has recently been opened up from drift 32, south of the McHarg shaft, on the upper contact, and half-way between it and the Evening Star.

IRON SILVER.—Operations continue with satisfactory results on the properties of this company, on Iron Hill and California Gulch. Nearly all the actively worked portions of the various mines are under lease to practical miners, who are generally doing very well, while the company, which collects quite high royalties on all the ore produced by lessees, is also deriving good profits. The McKeon shaft and contiguous openings are worked by the company, and are yielding considerable fine ore. The product from this

source last month was about 350 tons. The McKeon shaft follows the fault crevice down 400 feet; but winzes from this level, located to the north of the shaft, are down 200 feet farther, showing good ore. During the past week, a contract was let for sinking the shaft to greater depth, and it is now advancing at a good rate. The experiments at concentrating carbonate ores, it is stated, have advanced sufficiently far to demonstrate that it can be done advantageously and at a profit to the company. It now remains to be determined which of the machines in use, and offered to the company, will prove most economical and practical, and also to provide for an increased water supply, and to make such other provisions as will be found necessary for the practical operation of a concentrator on a large scale.

MANSFIELD.—This group of claims is to be worked. The owner, Mr. William G. Sheeds, has closed a contract with Chicago parties for their development for a third interest.

NEW PITTSBURG.—Mr. W. Van Norden, the President, has furnished us with the following: We have about 100 men at work, all on leases. Not much silver has been produced this summer, but a large amount of preparatory work and prospecting have been done. We have a considerable quantity of chloride ore in sight, and expect a large output the coming fall. Recently, nearly all our production has been through the Van Norden shaft, but several other shafts will be yielding ore by next month. The outlook is hopeful.

PINNACLE.—The Pinnacle shaft, on the Crown Point and Pinnacle combination, on Rock Hill, has struck a large body of ore. The mineral was encountered at a depth of 300 feet, being about 200 feet below the porphyry and limestone contact, in the blue limestone. The extent of the ore-body has not been determined.

SILVER CORD.—The streaks of sulphide ore recently encountered are vigorously explored, and promise to make into good ore-bodies. The ore returns good assays in silver and lead. Other portions of the mine are looking well, and the output of the property this month will approximate two thousand tons.

PARK COUNTY.

MUDSILL.—According to the Fairplay Flume, the new ore-vein struck in this mine appears to be all that was at first claimed for it. The ore runs from \$300 to \$450 a ton in silver, the value being in the form of sulphide and chloride of silver. A few hundred pounds of ore have been taken out.

PITKIN COUNTY.

ACQUISITION.—A dispute between the Acquisition Mining Company and lessees of the property caused some trouble on the 13th inst. The lessees, or their employes, however, hold the property, and on the 14th S. G. Collins, John Crowder, and several others were arrested on a warrant from Justice Sampson's court, under affidavit from Dunn, Secretary of the late Acquisition Mining Company, charging them with mine jumping and feloniously taking \$1000 worth of ore.

DAKOTA.

LAWRENCE COUNTY.

FATHER DE SMET.—Extracts from the superintendent's letters of August 1st and 4th show that Fourth level uprise is progressing well, and is now up about 67 feet. The last 4 feet have been all in ore, sampling from \$3 to \$5, and looking very encouraging for this part of the mine. The rest of the mine shows no particular change, though it has produced a little better quality of ore the past two weeks. The result of the clean-up of the mill for the final run in July, was 1234.68 ounces of gold, making 2040.88 ounces for the month's yield. The mine, especially the Eureka cut stopes, looks well. Third level chambers are yielding well and doing much better than was anticipated twelve months ago.

WELCOME.—To secure the payment of a chattel mortgage held by Messrs. Stebbins, Mund & Fox for \$2000, the following will be sold at public auction on the 18th inst., at the Snow Storm mill, in Nevada Gulch: About 2600 pounds of quicksilver in flasks; horses, harness, and wagons, and about 500 cords of wood. The property is in and near the Welcome mill office, stable, and buildings of the mortgagor, in Fan Tail Gulch, near Bald Mountain. Also all the mill machinery, boiler, engines, and machinery, appurtenances, tools, and personal property of every kind, situated in and about the Snow Storm mill.

IDAHO.

Antelope Mining District has just been formed, at Gem, with bounds as follows: All the waters of Antelope Creek that are in Alturas County; all the waters of Fish Creek, including the creek of Dead Man's Flat.

CRÆSUS.—The ledge is from four to five feet wide, and the ore goes as high as \$60 a ton in gold, besides carrying an average of 20 ounces silver. It also carries an eight-inch vein of iron pyrites, which is sold to the Philadelphia Smelting-Works for flux. The gold and silver ore is run through a reverberatory furnace and roasted, and then put through an arrastra. The tailings can then be concentrated.

HORN-SILVER.—It is reported that this mine, on Lost River, better known as Martin's mine, has been sold for \$55,000 to the Salt Lake parties that have been examining it. The new owners intend to work the property for all it is worth. It is stated that the managers of the Ontario Silver Mining Company, of Utah, are the ones who take the property, and that it is a remarkably good purchase.

MICHIGAN.

COPPER MINES.

COPPER FALLS.—The company is increasing its stamping facilities, and expects to have four stamps at work by January 1st, 1886, when it will produce 150 tons of mineral and 120 tons of copper a month.

TAMARACK.—The first annual meeting of the stockholders was held at Boston on the 12th inst., over 36,000 of the 40,000 shares being represented by something less than twenty shareholders. The financial statement showed receipts and expenditures to July 1st, as follows:

RECEIPTS.

40,000 shares stock at \$13 paid in	\$520,000.00
363 pounds copper in 1883 at 18c. a pound	65.34
7435 pounds copper in 1883 at 14 7/16 c. a pound	1,093.37
interest	3,588.38
Total receipts	\$524,747.09

EXPENSES.

Running expenses prior to 1885	\$123,486.21
Running expenses during 1885	24,088.41
Total running expenses	\$147,574.62
Construction prior to 1885	56,761.03
Construction during 1885	200,000.00
Real estate	200,000.00

* Total expenses	\$404,335.65
Balance of receipts	120,411.44

A supplementary statement showed the following assets at the Boston office, August 1st:

Cash	\$29,648.85
Hancock & Calumet Railroad bonds	46,000.00
Loan account	31,128.69
Assessment No. 1	573.00
Net assets Boston office	\$107,350.54

There were no liabilities at the Boston office August 1st. Any that may have been outstanding at the lake are not included. From detailed statistics, it appears that the tapping of the Calumet & Hecla lode has cost about \$192,000, or within the estimate of \$200,000, and that the work had been accomplished within the estimated time. It was voted that the capital stock of this company be increased to 50,000 shares, and that the 10,000 shares thus authorized be placed in the treasury, to be issued at such times and in such amounts and on such terms as the directors may deem for the best interests of the company, provided that whenever any of said 10,000 shares shall be issued, it shall first be offered to the stockholders of the company *pro rata*. The following directors were chosen: Joseph W. Clark, Nathaniel Thayer, John M. Forbes, George F. Bemis, and John N. Denison, of Massachusetts, Horace Fairbanks, of Vermont, and John Daniell, of Michigan. It further appeared that Captain Daniell, the superintendent at the mine, estimated that \$75,000 would be required at the mine between August 1st and November 30th, and it was contemplated to erect a stamp mill to cost from \$125,000 to \$150,000, next spring. A rock-house and six double dwelling-houses were to be erected this fall. It was developed that no issue of stock was probable until the \$12 unpaid on the present 40,000 shares had been assessed, and that an assessment of \$3 per share might be levied in the course of a few months. The company had a balance of over \$100,000 on hand and the right to assess \$480,000 on the present stock, and only pointed out the necessity for using \$225,000 for upward of a year. Other statements showed that the underground development of the mine was in progress, and that superstructures above ground would be in readiness to crush ore in November. Production of rock was to begin at once, and to increase as fast as possible.

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 Wednesday, August 12th:

Marquette	Gross tons	370,405
Pig-iron	1,570	
L'Anse	19,136	
St. Ignace	48,248	
Pig-iron	2,616	
Escaraba, Marquette District	299,477	
Menominee District	408,947	

The shipments by lake from all ports of the district up to date amount to 1,126,977 gross tons, the falling off, compared with last season, being 430,830 tons.

PITTSBURG & LAKE SUPERIOR.—This company will, it is stated, sink two shafts to the deposit found with the diamond drill two years since, and will put on a large force of men at once.

MINNESOTA.

The shipments of iron ore from the port of Two Harbors were as follows for the week ended August 12th:

Minnesota Iron Company	Gross tons	10,311
Previously reported	113,056	
Total	123,367	

MONTANA.

BEAVER HEAD COUNTY.

HECLA CONSOLIDATED.—The bullion production for June and July is as follows:

	Silver.	Gold.	Lead.	Copper.
	Ounces.	Ounces.	Pounds.	Pounds.
June	63,533.23	30.22	559,104	...
July	61,207.30	32.36	446,473	36,139

LEWIS & CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—The following statement is furnished by the company: During July, the 50-stamp mill worked 28 days—50 stamps—and crushed 3000 tons, yielding \$82,600, including clean-up, averaging \$27.53 a ton. The 10-stamp mill worked 20 days—10 stamps—and crushed 239 tons, yielding \$7300, averaging \$30.54 a ton. Total ore crushed July, equals 3239 tons. Total yield, including clean-up and concentrates, equals \$93,200. Total average value of bullion produced equals \$28.77 a ton. Total working expenses equal \$37,000. Will remit \$ cash in twenty days, on account of July profit.

Appended to this is the subjoined: Since the date of the monthly return (July 7th), the directors at London have received the \$35,000 mentioned therein on account of May; and on July 24th, received a telegram announcing a further remittance of \$25,000 on account of June.

PENOBSCOT & SNOWDRIFT CONSOLIDATED MINING COMPANY.—In response to a number of inquiries, we applied to Messrs. Spencer, Trask & Co., Nos. 16 and 18 Broad street, New York City, to know the disposition that had been made of the company's assets, and we have received the following letter: The corporation was dissolved by order of the court early in 1884, and the trustees appointed to sell out all its property have been trying to find a purchaser ever since. This summer, they have succeeded in selling out the mine and all remaining there for \$4000. The machinery, etc., had been previously sold, and, as shown by circular, dividend No. 1, in liquidation of 12 cents a share, paid to stockholders. The proceeds of this last sale, with the drippings from small sales and interest on funds since, will aggregate enough to pay a final dividend in liquidation of from 8 to 12 cents a share. You will see papers herewith covering steps taken, and showing delay in selling property because of no purchasers offering. The vote in favor, 76,323 shares out of 100,000, I note on copy of proxy. Yours truly, GEORGE F. PEABODY.

We have carefully looked over the printed circulars to the stockholders of the Penobscot & Snowdrift Consolidated Mining Company, in which the fruitless work done at the mine previous to its final abandonment in January, 1881, is mentioned, and it appears that the several steps since taken to dispose of the property of the company were submitted to and approved by the stockholders; indeed, from the record there was nothing else to do. The ore had altogether given out, and a large sum of money had been expended in vain endeavors to find pay ore. Whether the price realized on the sale of the property was its full value we have no means of judging; but so far as the record goes, every thing appears to have been done in a perfectly open and straightforward manner, as might have been expected from the gentlemen connected with the enterprise, and the stockholders were fully advised in time of every step taken.

In addition to the above information, we learn

from a correspondent of the Helena *Independent* that "the mine is again opened up to the 100-foot level, and is getting into shape for working. Mr. Longmaid, the present owner, is putting in pans to treat the lower grade ores and base ores that could not be worked successfully over plates. The mill is also getting in order.

SILVER BOW COUNTY.

LIQUIDATOR.—It is stated that a concentrator having a capacity of 125 tons a day is to be erected on this property. The machinery has been ordered and excavating for the building begun.

NEVADA.

ELKO COUNTY.

LONDON SYNDICATE BLUE JACKET MINES.—Experienced miners are wanted by this company at Blythe City. Wages, \$3 a day.

EUREKA COUNTY.

An abstract statement from the quarterly assessment roll of the proceeds of the mines of this county for the quarter ended June 30th shows that 10,388 tons of ore were extracted, valued at \$267,330.

EUREKA CONSOLIDATED.—The superintendent reports for the week ended August 9th: We have hoisted 437 car-loads of tribute ore. The Williams pitch holds its own very well, and Kinsman's and Helman's pitches show a little improvement. The other pitches throughout the mine are not looking so well as they were a little time ago, and unless we strike something new very shortly, our production must fall off materially. Every thing in and around the mine is in good working order. During the week, the furnace has produced 750 bars of bullion, or over 41 tons, of an average value of over \$269 a ton. As far as I can judge at present, the roast of 500 tons of speiss is progressing as well as could be expected. Nothing definite concerning this will be known until the experiment is finished. If the speiss can be roasted economically, we shall demonstrate the fact; and if it can, we have an immense quantity on hand, worth a great deal of money.

RICHMOND CONSOLIDATED.—The company began the shipment of lead on the 15th inst. It is proposed to ship about 3000 tons, the company having on hand about that much outside of the 8000 tons under attachment. Shipments will be made for some time.

RUBY & DUNDEBERG.—Fair progress is reported in the developments going on at the Lord Byron and Home Ticket mines, though the ground where the shaft is sinking at the former mine continues very hard, and thus delays this work somewhat. The quality of the ore at the Home Ticket is again improving in quality.

LANDER COUNTY.

Stevenson's new concentrating mill, near the Morgan mine at Galena, has started up successfully, and has been running steadily. In constructing the mill, provision was made for ten stamps, five of which are now in operation. The others will be added as soon as it has been demonstrated that the base ore of the district can be concentrated at a profit.

STOREY COUNTY—COMSTOCK LODGE.

ALTA.—The uprise from the 850 level has been discontinued on account of the intolerable heat caused by the want of sufficient air. A west drift has been started from the north lateral on the 700 level. They have about 500 feet to run before reaching a point where they expect to cut the vein. The face of the drift is in hard rock, but they will enter more favorable ground after advancing a few feet. They expect to reach the main vein in about ten weeks.

CONSOLIDATED CALIFORNIA & VIRGINIA.—During the week ended the 8th, there were extracted on the 1750 level 934 tons of ore, and shipped to the Morgan mill 890 tons and 1070 pounds. The average assay value of the ore milled during the week, as by samples taken from the batteries, was \$18.98 a ton. Shipped to San Francisco office, bullion with the assay value of \$33,698.28, which makes a total of \$61,375 shipped from July 18th to date. They have extracted under the Jones contract 369 tons of ore, and shipped to the Eureka mill under this contract 455 tons and 730 pounds. The average assay value of the ore milled during the week, as by samples taken from the batteries, was \$14.81 a ton.

CROWN POINT AND BELCHER.—These mines have been shut down. Prior to the closing down, a large quantity of the ore shipped from the Belcher was

taken from the 1700, and is of much higher grade than that obtained from the levels above. When the fall storms set in, so that the work of extracting ore can be resumed, this vein will be followed down to the water-level.

JUSTICE.—Two bars of bullion, valued at nearly \$4000, have been shipped. The ore from which this bullion resulted was taken from the 450 level in the south end of the mine, and was hoisted through the Woodville shaft. There is a large deposit of low-grade ore at this point, extending from the grass-roots to below the 900 level. The company is about to inaugurate vigorous prospecting operations in all the different levels of the mine. The old Thompson mill has been leased and put in thorough repair, and will run on ore from this mine.

KENTUCK.—The daily shipments of ore average between 45 and 50 tons. This ore is hauled to the Rock Point mill at Dayton. The mill has a crushing capacity of between 50 and 60 tons in twenty-four hours. It is operated by water-power. All of the modern improvements for cheap handling of free-milling ores were introduced in its construction. The actual cost of hauling the ores from the mine to the mill and crushing it is said to be only \$4 a ton.

SIERRA NEVADA.—A west cross-cut has been started from a point in the north lateral drift on the 520 level-1000 feet from the shaft.

YELLOW JACKET.—A full force will be put on September 1st, when the Brunswick mill gets steam up.

VERMONT.

WINDSOR COUNTY.

ROOKS.—We have received the following from Mr. H. L. White, Treasurer, in answer to our letter making inquiry as to the stoppage of the works: "In reply, permit me to say that the company took down its mill to erect a 100-ton mill on its site, and intended to put in stamps, but, owing to difference of opinion and later developments, it was concluded to test some of our ore by a more modern machine, so we are now working ore by some three different pulverizers and crushers, by which, if as successful as we expect, our mill will be less expensive by one half, and more compact, and take less water. We expect to be running again soon."

BULLION PRODUCTION FOR 1885—SPECIAL OFFICIAL REPORTS.

MINES.	States.	Month of July.	Year from Jan. 1st, 1885.
Adams, s. L.	Colo.	\$ 35,000	\$ 241,103
Alice, g. s.	Mont.	109,326	658,562
Belmont	Nev.		10,003
Bodie, g.	Cal.		**17,967
Boston & Montana, g.	Mont.		226,840
Christy, s.	Utah		130,229
Chrysolite, s.	Colo.		31,428
Colorado Central, s.	Colo.	23,535	135,207
Consolidated Bobtail, g.	Colo.		41,228
Deadwood-Terra, g.	Dak.		177,291
Derbec Blue Gravel, g. s.	Cal.		79,789
Essex, g. s.	N. S.		6,474
Eureka Consolidated, s. L.	Nev.		10,266
Father de Smet, g.	Dak.	33,866	230,474
Freeland, g. s. c.	Colo.	30,007	192,225
Grand Prize, s.	Nev.		153,643
Granite Mountain, s.	Mont.	105,277	613,820
Hall-Anderson, g.	N. S.		7,741
Head Center & Tranquility.	Ariz.		85,396
Hecla Consolidated, g. s. L. c.	Mont.		*339,640
Helena, g. s. L. c.	Mont.		473,544
Homestake, g.	Dak.		489,976
Hope, s.	Mont.	11,400	91,846
Iron Silver, s. L.	Colo.		251,167
Kentuck, s.	Nev.		2,328
Lexington, g. s.	Mont.	73,975	504,802
Montana, Limited, s. g.	Mont.	86,298	499,317
Moulton, s. g.	Mont.		310,792
Mount Diablo, s.	Nev.		149,312
Navajo, s.	Nev.		82,894
New Hoover Hill, g. s.	N. C.	6,400	43,609
New Pittsburg, s.	Colo.		9,594
North Belle Isle, s.	Nev.		2,118
Ontario, s.	Utah		901,259
Oxford, g.	N. S.	2,999	7,860
Plymouth Consolidated, g.	Cal.	82,241	575,849
Rooks, c.	Vt.		28,383
south Yuba, g.	Cal.		1,168
Standard Consolidated, g.	Cal.	24,220	102,698
Stormont, s.	Utah	14,442	97,313
Syndicate, g.	Cal.		**62,327
Tombstone, g. s. L.	Ariz.	61,629	403,875
Total.			8,464,641

G., gold; S., silver; L., lead; C., copper. Silver valued by the different companies from \$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, August 21.

The improvement in business that we have already noted since the end of July still continues and widens. New industries or new fields are coming under its influence, and even the iron and, to a still less extent, the coal trade is certainly feeling its effect.

It must not for a moment be supposed that we are having or are on the point of having a "boom." There is not yet the faintest indication of a boom, nor is any desired. Prices, except in a few instances, are unchanged, and it is to be hoped will not advance rapidly, but there is a noticeably better feeling among business men, and a larger business is actually being done.

We believe the "dead-center" has been passed, and we are once again on the upward stroke in business. "So mote it be."

Silver.

DATE.	London.	N. Y.	DATE.	London.	N. Y.
	Pence.	Cents.		Pence.	Cts.
Aug. 15	49	166 $\frac{3}{4}$	Aug. 19	48 $\frac{3}{4}$	165 $\frac{3}{4}$
17	49	166 $\frac{3}{4}$	20	48 $\frac{3}{4}$	165 $\frac{3}{4}$ @ $\frac{1}{2}$
18	48 $\frac{3}{4}$	166 $\frac{3}{4}$	21	48 $\frac{3}{4}$	165 $\frac{3}{4}$ @ $\frac{1}{2}$

Mainly from lower exchange on India, the London market for silver has declined the past week. This, and lower sterling exchange here, have lowered our rates, as by figures of accompanying table.

The Treasury Department purchased 295,000 ounces of silver on the 14th and 200,000 ounces on the 18th inst., both for delivery at the Philadelphia Mint for coinage into standard dollars.

It is learned at the Department that there is now a brisk movement of silver dollars all over the country. The issue averages about \$100,000 a week more than during the same period of last year, and is slightly in excess of the regular monthly coinage of \$2,000,000.

Unquestionably, the government can secure the circulation of a very large amount of silver by withdrawing the \$1 and \$2 notes, and a still larger amount by withdrawing the \$5 notes. And though we believe this course would prove extremely unpopular, yet the danger from an increasing accumulation of silver could be thus avoided, and the question would be settled once for all as to what amount of silver we can or are willing to keep in circulation.

We can not hope for any coöperation from other countries in any effort to secure an international agreement on the relative values of gold and silver for general circulation. The State Department is advised by the ministers to whom letters of instruction were sent to present the desire of our government to again consider the question of international coinage, that all efforts in that direction have been without success or encouragement. The Monetary Conference that recently met in Paris and adjourned practically ended all hope of another congress.

Shipping Gold by Mail.—A press dispatch from San Francisco, dated August 17th, states that, notwithstanding Sub-Treasurer Spaulding's angry but qualified denial, it is ascertained that gold coin is still shipped in large amounts by mail from San Francisco to New York. According to the reports of those who claim to be thoroughly informed upon the subject, more than \$10,000,000 had been sent from the Sub-Treasury vaults here as ordinary postal matter. If your correspondent's information is true, the last shipment was made by the mail leaving San Francisco on Saturday morning, the 15th inst. The amount was \$300,000 in gold coin, put up in 400 sacks, and then packed in three rawhide trunks.

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 £312,331 bullion; and the proportion of its reserve to its liabilities was raised from 44 $\frac{1}{2}$ to 46 $\frac{1}{4}$, against 43 $\frac{1}{4}$ per cent at this date last year. On the 20th inst., the bank gained £14,000 bullion on balance.

Copper.—The market here is without feature, and prices nominally lower, though there is still the same confidence among producers and dealers in higher prices during the autumn months. Lake may be quoted 11 $\frac{1}{2}$ @11 $\frac{1}{2}$ c., according to brand; Orford, 10-25@10-35c.; Baltimore, 10-30@10-35c.

In London, according to cables to the Metal Exchange, Chili Bars have fluctuated from £43 to £43 12s. 6d., closing to-day at £43 5s. Best Selected, £48 10s.

Official reports state that the exports of copper reduced to fine from Chili in 1884 amounted to 96,942,720 pounds fine (43,378 gross tons), as against 90,809,600 pounds fine in 1883. The increase in 1884 was due to the depreciated money with which the chief items of cost of production are paid. As there is every probability of Chili being able, before long, to resume specie payments, and as it will then be impossible to produce copper there without a heavy loss at present prices of Chili Bars, we may naturally expect a decline in production at this important source of supply.

Tin.—This market, following London, has again advanced the price of tin. In London, the price advanced steadily from £90 5s., at which it stood a week ago, to £93 10s.; yesterday, and £94 this morning, receding to £93 10s. this evening. Here, the price has advanced from 20-35c. a week ago to 21@21 $\frac{1}{4}$ c. to-day for spot, and futures 20-65c. @20-80c.

Lead.—The Corwith Combination still holds the market firm, without being able to force consumers to take any important part of the "C. C." holding.

Perhaps the most important "news" is from the Eureka Sentinel of the 15th inst. It says the Richmond has commenced shipments of lead, having some 3000 tons available for shipment, exclusive of the 8000 tons held to await the decision of the courts.

If these 3000 tons are to be handled outside of the "C. C.," then consumers will have nothing to fear, while if they are to be taken up by the "C. C.," the additional load may make "the game not worth the candle" when a sudden decline would take place. At present, the position favors the producers (and the "C. C."), though there are some signs of weakness. Chicago reports a dull market and no buyers at the 4-17 $\frac{1}{2}$ c. and 4-20c. asked there.

Direct advices to this city to-day state that the Richmond has 2000 tons free from attachment, and that arrangements are being made with the view of landing some of it here by rail. This of course would leave very little margin for the producer, even at the present price of lead here, and if it should break the price to 3-80c. or 4c., it would be as well for the company to hold the lead where it is. Sent by water, it could not arrive for four months, and in the mean time, no doubt, the "C. C." would "make hay."

The price here is 4-25c. asked, with sales of about 500 tons—not "C. C." lead—at 4-25c. The market is dull, and consumers show a remarkable aversion to purchasing from the "C. C." We hear that these have shipped several hundred tons to the East, where it has been sold at 4-80c., which, we are told, would in some cases net less than 4-20c. here.

Cables to the Metal Exchange quote Soft Spanish in London, £11 12s.

Messrs. Everett & Post, of Chicago, telegraph to us as follows to-day:

Since our last report, circular price here was made at 4-20c. We hear of only one sale of 150 tons. Now the market is a little easier at 4-15c. bid, 4-17 $\frac{1}{2}$ c. and 4-20c. asked. Market very dull and no buyers.

Spelter and Zinc.—Spelter is quite firm at 4-35c., which has been paid, we understand, for 10 cars Domestic, to 4-50c. for special brands. The Silesian spelter in London stands at £14, and here at 4-70@4-75c. Sheet-Zinc is firmer at 5 $\frac{1}{4}$ @5 $\frac{1}{2}$ c. for Domestic, according to brands.

Antimony.—This metal is dull and unchanged at 9c. for Hallett's and 9 $\frac{1}{2}$ c. for Cookson's. In London, £37 for Hallett's.

Bismuth.—Worth from \$2@\$.25 a pound.

Aluminium.—\$8@\$.9 a pound; 10 per cent Cowles Aluminium Bronze Ingots, \$1 a pound; 7 per cent Aluminium Bronze, 78c. a pound; 5 per cent Aluminium Bronze, 56c. a pound; 2 $\frac{1}{2}$ per cent Aluminium Bronze, 34c. a pound; Aluminium Silver, 75c. an ounce.

The Cowles Company is now able to produce an aluminium bronze containing 60 per cent, 80 per cent, and even 90 per cent of aluminium.

The aluminium silver alloy is composed of 1 part of 5 per cent aluminium bronze and 2 parts nickel; recent specimens gave the remarkable results of 77,000 pounds per square inch, with a stretch of 33 per cent, and 111,000 pounds per square inch breaking load.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, August 21.

American Pig.—There appears to be an organized attempt to get the papers to "boom" the Western iron trade, but it does not produce much effect here.

There is, as we have stated elsewhere, a noticeable improvement in the tone and even in the volume of business, but the improvement in but very few cases has extended to prices. Iron is not one of these. Some favored makers hold firmer than a month ago at quotations, and there is not quite as much slaughtering going on, but good Lehigh iron can still be purchased at \$17.50@18 for No. 1 X; \$15.50@16 for No. 2 X; and \$15@15.50 for Gray Forge, tide-water delivery, with outside brands selling "measurably" below these figures.

Scotch Pig.—There is nothing worthy of note in this article. Prices here remain nominally unchanged at \$19.50@20 for Coltness; \$18.50@19 for Summerlee; and \$17.50 for Eglinton; but these prices are shaded when occasion requires.

From Glasgow, cables to the Metal Exchange quote Coltness at 48s., and Eglinton at Ardrossan, at 40s. 9d.

Steel Rails.—There is greater strength in the steel rail market since the meeting. As we stated last week, the basis on which the percentages of the companies was based was 750,000 tons, but one company was allowed 10,000 tons in excess of its quota, in order to allow it to run its works single-turn, and an outside company not included in the immortal eleven was apportioned 15,000 tons.

Last week, owing to a typographical error, the Cleveland Rolling-Mill Company was omitted from our list of companies represented at the meeting of the steel makers at Long Branch, on the 11th and 12th instant. The following companies were represented: Carnegie Brothers; Pennsylvania Steel Company; Bethlehem Iron Company; North Chicago Rolling-Mill Company; the Cambria Iron Company; Lackawanna Coal and Iron Company; Joliet Iron and Steel Company; the Cleveland Rolling-Mill Company; the Union Iron Company; the Scranton Steel Company; the Albany & Rensselaer Iron Company; and the Worcester Steel-Works.

The agreement is for the regulation of the production of 1886, and as it does not regulate prices or production for this year, and as there are no penalties attached to the violation of the agreement, it can scarcely be considered a very strong one.

There are inquiries in this market for from 75,000 to 80,000 tons of steel rails, but purchasers seem unwilling to pay the nominal price, \$28, and it is said are still able to buy at \$27, though this is \$1 above what was paid two months ago. We hear of about 20,000 tons of rails having been sold during the week. The nominal price at the mills is \$28.

Bessemer Pig and Spiegeleisen.—Prices are quite unchanged at \$16@17 for No. 1 Domestic, and \$18@19 for Foreign.

Spiegeleisen, 20 per cent manganese, sells at \$24.50@25.50, and Ferro-manganese 60 per cent, \$50.

Manufactured Iron.—The trade reports more business in bar iron at unchanged prices. Common iron about 1.50c., and Refined 1.75c. Plates vary from 1.90@2c. for Common, but these prices have been shaded. Flange iron, 3½c.; Steel Plates 2¾@3c.; and Boiler Plate Steel, 3@3¼c.

Structural Iron.—Angles are quoted 1.80@1.90c.; Tees, 2.25c.; Beams, 3c.

Old Rails.—These and old car-wheels are not as abundant as generally supposed. The former are in demand at \$17, though some are quoted at a lower figure. Old wheels sell at from \$14.50@15.

BRITISH EXPORTS TO THE UNITED STATES.

ARTICLES.	JULY.		7 MONTHS.	
	1884.	1885.	1884.	1885.
	Tons.	Tons.	Tons.	Tons.
Pig-iron	12,767	6,973	103,656	62,601
Old iron for re-manufacture	2,101	2,158	17,877	6,557
Steel unwrought	1,127	1,131	8,149	7,043
Tin plates	23,399	21,616	129,507	137,477
Hoops and sheets	1,727	2,021	9,027	10,544
Bar, angle, bolt, and rod	191	231	2,879	1,311

Philadelphia.

Aug. 21.

[From our Special Correspondent.]

The arrangements entered into for the supply of ore contemplate some very large deliveries during the next sixty days. Explorations are making in Cuban ore-fields with the view of further development. The Jersey and Pennsylvania ore-fields are worked in a moderate way. Three furnaces will blow out as soon as supplies are smelted, one using fossil ores, which can not be worked to advantage.

Pig-Iron.—The week's business in No. 1 Foundry iron has been done mostly at \$17.25@17.50, though there have been sales running up toward a thousand tons of good or special Foundry at \$18. There has been no weakness, and will be no further weakness this fall in good irons, whether foundry or forge. The inquiries for special brands have been such as to lead the makers of them to hold out more firmly. The ordinary irons are still picked up at irregular prices. Sellers are unwilling to refuse any offer that will let them out. The business is only the regular demand. No large lots are selling. The mill men will not buy more than a month's supply of forge, and are using ordinary pig where an advantage of 50 cents a ton is to be had. Forge ranges from \$14.50@15.75. One hundred ton lots are selling every day.

Bessemer.—No sales have been closed. There was an offer for a 1000-ton lot and some inquiries for two or three 500-ton lots and less, but no transactions. Freighters are favorable. Spiegel is coming in in small lots, and for 20 per cent, \$24.50. Several small lots of Scotch iron were hauled to foundries this week.

Blooms.—The bloomeries are working about half-time.

Muck-Bars.—One or two parties are sacrificing stock for cash. Good muck-bars can be delivered at \$27. The mills are turning out a great deal. Orders since Monday reported by three agents, 700 tons.

Manufactured Iron.—This is the time when more business is confidently looked for. More business is coming in, but it is light, considering what ought to be done. One manufacturer reports orders for 140 tons for the week, and others smaller amounts not enough to keep going full-time. Representatives of interior mills have taken fair orders at 1.50@1.65c. Prices are not weakening.

Nails.—The extremely low offers of a week or two ago are not heard of, though the improvement in demand does not justify higher prices. The prolonged curtailment is given as the reason for the firmness, particularly in small lots. The builders in town and out are buying freely. Card rates, \$2.20; selling from 10 to 15 cents off.

Wrought Pipe and Tubes.—The steady demand is noted in Western as well as Eastern mills at firmly adhered to discounts. The agents negotiating for late fall business expect to have enough business in hand in September to last them to the close of the year.

Sheet-Iron.—The only expression made is, that business is of a hand-to-mouth character, and that the good time is in the distance. The store lots selling show prices firm.

Slabs.—Nail slabs are delivered here at \$32. The Pennsylvania Steel-Works has all the business in this direction it can do, but the Pittsburg Bessemer Company is supplying the greater part of the demand.

Plate and Tank.—Buyers are very careful. The Harrisburg mills have gathered up enough business for a two months' run. Prices are away down. Plates 1.90c. shaded.

Structural Iron.—The mills are all very well fixed for the present. The orders received since Monday have been small. A large amount of material is going into building. Angles, 1.80@1.90c.; Tees, 2.25c.; Beams and Channels, 3c.

Steel Rails.—Large orders have been booked, reported by outsiders at 30,000 tons. The company representatives themselves are extremely anxious to have the assistance of the press to create the impression that rails that are bound to go up. The eleven mills are able to meet all requirements at current rates, but it would not be surprising to see some little advance for the present, though it will not be easily maintained.

Old Rails.—Old rails are selling at \$17. Some lots are offered by railroad companies and by foreign holders, but demand is not very urgent.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, August 21.

Statistics.

Production Anthracite Coal for week ended August 15th, and year from January 1st:

Tons of 2240 lbs.	1885.		1884.	
	Week.	Year.	Week.	Year.
P. & Read. RR. Co.	267,464	6,378,020	261,271	6,460,995
L. V. RR. Co.	151,618	3,244,101	143,835	3,514,442
D., L. & W. RR. Co.	122,815	2,594,247	141,645	3,026,343
O. & H. Canal Co.	70,150	2,097,346	110,049	2,217,732
Penna. RR.:				
N. & West Br. RR.	30,629	701,503	6,870	280,919
S. H. & W. B. RR.	4,947	136,779	4,879	138,505
P. & N. Y. RR.	9,255	236,656	13,102	249,544
Penna. Coal Co.	24,384	735,328	35,016	762,726
Penna. Canal Co.	8,968	203,476	.....	214,440
Shamokin Div., N. C. RR.	22,821	567,523	23,173	619,459
N. Y., L. E. & W. RR.	*9,500	305,891	12,802	335,563
Total	722,551	17,160,870	752,642	17,820,668
Increase	.....	.....	.....	.....
Decrease	30,091	659,798	.....	.....

* 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.....13,195,348 | 1882.....17,301,166
1881.....16,798,470 | 1883.....18,204,683

Production Bituminous Coal for week ended August 15th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

	1885.		1884.	
	Week.	Year.	Week.	Year.
Philadelphia & Erie RR.	23	18,697	.....	.....
*Cumberland Region, Md.	57,315	1,654,375	65,045	1,703,932
*Barclay Region, Pa.	5,428	147,500	5,046	192,085
Broad Top Region, Pa.	.....	.....	.....	.....
Huntington & Broad Top RR.	1,918	97,655	3,266	118,330
East Broad Top RR.	.....	.....	.....	.....
Clearfield Region, Pa.	.....	.....	.....	.....
Snow Shoe	1,785	92,958	3,402	114,277
Karthauss (Keating)	2,184	78,475	1,388	22,836
Tyrone & Clearfield	45,477	1,819,462	58,454	1,919,985
Alleghany Region, Pa.	.....	.....	.....	.....
Gallitzin & Mountaintain	10,405	318,094	6,303	229,457
Total	124,535	4,227,216	142,904	4,300,902

WESTERN SHIPMENTS.†

	1885.	1884.
Pittsburg Region, Pa.	.....	.....
West Penn RR.	2,552	146,000
Southwest Penn. RR.	1,493	60,606
Pennsylvania RR.	4,759	133,914
Westmoreland Region, Pa.	.....	.....
Pennsylvania RR.	34,848	704,034
Monongahela Region, Pa.	.....	.....
Pennsylvania RR.	10,308	167,108
Total	53,960	1,211,632

Grand total 178,495 5,438,878 181,284 5,633,194

† 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 August 14th and year from January 1st. Tons of 2000 pounds:

Kind of coal.	1885.		1884.	
	Week.	Year.	Week.	Year.
Cannel	514	1,056	14,262	11,391
Gas	5,221	3,297	236,776	191,722
Splint and block	5,472	1,720	95,419	50,261
New River, etc.	13,537	8,948	347,143	270,544
Coke	2,508	1,734	73,324	37,979
Total	27,252	16,755	757,024	561,897
Increase	.....	.....	195,127	.....

Production of Coke on line of Pennsylvania RR. for week ended August 15th, and year from January 1st: Tons of 2000 pounds.

	1885.		1884.	
	Week.	Year.	Week.	Year.
Alleghany Region	4,058	118,142	2,408	82,712
West Penn. RR.	986	30,139	80	24,865
Southwest Penn. RR.	37,207	1,201,293	51,929	1,392,143
Penn. & W. Region	6,240	151,521	4,406	118,845
Monongahela	1,514	62,928	1,517	49,340
Pittsburg Region	.....	.....	.....	136
Snow Shoe	543	10,206	603	14,566
Total	53,548	1,574,229	60,943	1,682,607
Decrease	.....	108,378	.....	.....

Anthracite.

We give the following as fair prices of hard and free-burning coals f. o. b. New York shipping ports:

	Selling prices.	Circular rates.
Broken and Egg	\$3.00@3.25	\$3.40@3.65
Stove	3.60@3.80	4.00@5.00
Chestnut	2.85@3.40	3.65@4.00
Pea	1.80@2.20	2.45@2.65
Buckwheat	1.50@2.00	.....

There is a slightly better demand but not sufficient to prevent an accumulation of stocks. A better business and better prices are generally expected next month, but that is without the knowledge of the true inside operations and feelings of the big companies. There are no indications of either a curtailment of production or an advance in prices. The latter is certainly not to be expected. In fact, there are very strong indications of trouble. Of course, the companies

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, SHARES (No., Par value), ASSESSMENTS (Total levied to date, Date amount and share of last), DIVIDENDS (Total paid to date, Date and amount per share of last). Rows include Adams, Alice, Amie, Atlantic, Argenta, Barbee & Walker, Bassick, Belle Isle, Belcher, Big Bend Hydraulic, Black Bear, Bodie, Bonanza Development, Bonanza King, Boston & Mont, Breece, Butte, Calumet & Hecla, Carbonate Hill, Caribou, Castle Creek, Central, Christy, Chrysolite, Colorado Central, Con. Gold, Contention, Copper Queen, Crown Point, Deadwood-Terra, Debar, Dunkin, Durck, Evening Star, Excelsior, Father de Smet, Franklin, Greenland, Idaho Enterprise, Iron, Iron Silver, Jackson, Jacksonville, Kentuck, La Plata, Leadville, Lexington, Little Chief, Little Pittsburg, Manhattan, Margarita, Martin White, Massey, Morning Star, Mount Pleasant, Mt. Diablo, Napa, Navajo, New Hope Hill, New York Hill, New York & Colo., Northern Belle, North Belle Isle, Ontario, Ophir, Original, Osceola, Oxford, Paradise Valley, Pleasant Valley, Plymouth, Prussian, Quick Silver, Quincy, Richmond, Rising Sun, Robinson, Robert E. Lee, S. J. L., Sierra Nevada, Silver King, Small Hopes, Smuggler, Socorro, South Yuba, Spring Valley, Standard, Stormont, St. Joseph, Syndicate, Tip Top, Tombstone, True Fissure, United Verde, Valencia, Visalia, Yellow Jacket.

Table with columns: NAME AND LOCATION OF COMPANY, SHARES (No., Par value), ASSESSMENTS (Total levied to date, Date amount and share of last). Rows include Albion, Alouez, Alpha, Alfa, American Flag, Barcelona, Battle Creek, Bear Creek, Beauce, Belvidere, Belmont, Best & Belcher, Big Pittsburg, Black Jack, Bonanza Chief, Bonholder, Boston Con., Boulder, Bradshaw, Buckeye, Bull Dominguez, Bullion, Bye and Bye, Calaveras, Cal. W. & M. Co., Caledonia, Catskill, Central Arizona, Chapparral, Cherokee, Chollar, Castle Creek, Cal. & Va., Con. Imperial, Con. Pacific, Crescent, Crocker, Crows, Coxhead, Dahlonega, Dardanelles, Decatur, Deseret, Durango, Elko, Empire, Enterprise, Eureka Tunnel, Globe Copper, Gold Placer, Goodshaw, Grand Belt, Granville, Gregory, Harlem, Head Center, Hidalgo, Hortense, Julia, Leviathan, Lucerna, Mammoth Bar, Mariposa, May Belle, Mexican, Michoacan Synd., Miner Boy, Miller, Mono, Moose Silver, Nevada Syndicate, New Pittsburg, North Standard, Noonday, Old Dominion, Oriental, Oriental & Miller, Overman, Park, Peerless, Pius, Quartz, Rappahannock, Red Elephant, Retort, Silver Cliff, Sonora, South Bodie, South Bulwer, South Hite, South Pacific, State Line, Sullivan, Suro Tunnel, Tamarack, Taylor-Pumas, Togo, Todos Santos, Tuscara, Unadilla, Union Con., Utah, Vandewater, Washington, Wellington, Whalen Copper.

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. + This company, as the Western, up to December 10th, 1881, paid \$1,400,000. † Non-assessable for three years. ‡ The Deadwood has previously paid \$275,000 in eleven dividends, and the Terra \$75,000. § Total number of shares, 511,901; 51,000 shares have never been issued, and are still held by the company.

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.										SALES	NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.										SALES				
	Aug. 15.		Aug. 17.		Aug. 18.		Aug. 19.		Aug. 20.				Aug. 21.		Aug. 15.		Aug. 17.		Aug. 18.		Aug. 19.			Aug. 20.		Aug. 21.	
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.			H.	L.	H.	L.	H.	L.	H.	L.	H.	L.		H.	L.	H.	L.
Alice, Mon.												800	Albion														
Amie Con. Co.	.02										.02	700	Alta												1,100		
Argenta													American Flag														
Bassick, Co.													Barcellona, G.														
Belle Isle, Ne.													Bechtel Con., G.														
Bodie Cons., Ca.	1.95		2.00	1.95	1.95						1.90	850	Belvidere														
Breece, Co.											.13	2,000	Belcher												350		
Bulwer, Ca.											.47	700	Best & Fisher, G. S.	2.40						2.25							
California, Ne.													Big Pittsburg, S. L.														
Cal. & Hecla, Mich.													Bradshaw, S.														
Castle Creek													Bull-Domingo, S. L.														
Chollar													Cal., B. H., G.				1.45	1.25	1.45				1.30		2,040		
Chrysolite, Co.	.99											100	Central Arizona, S.											.16	1,500		
Colorado Central												200	Chollar	1.50											200		
Cons. Cal. & Va., Ne.			2.15				2.05		2.03		2.10	1,900	Cons. Imperial														
Crown Point													Cons. Pacific														
Dunkin, Co.													Dahlonaga														
Eureka Cons., Ne.													Decatur														
Father de Smet, Dk.													Durango, G.														
Findley, Ga.													Eastern Oregon														
Gold Stripe, Ca.													G. Adshaw, G.														
Gould & Curry, Ne.													Harlem M. & M. Co.														
Grand Prize, Ne.											.70	200	Hortense, S.														
Green Mountain, Ca.													Kosuth														
Hale & Norcross, Ne.	6.25						6.00		6.25		4.00	400	Lacrosse, G.														
Hall-Anderson, N. S.							16.50		16.88		16.75	168	Mariposa Pref., G.														
Homesake, Dk.	16.75		16.00				16.50		16.88		16.75	168	Mexican, G. S.												200		
Horn-Silver, Ut.			2.10		2.20	2.10	2.10	2.00			.25	50	Mone											1.30	50		
Independence, Ne.													New Pittsburg														
Iron Silver, Co.	1.20			1.10		1.10					.38	1,300	Noonday														
Leadville C. Co.												200	North Standard, G.														
Little Chief, Co.												500	S. Horn-Silver, S. L.												1,000		
Little Pittsburg, Co.													Drint'l & Miller, S.												100		
Martin White, Ne.												800	Potosi	1.00											1,000		
Moulton							1.40					400	Sappanannock, G.							.06					1,000		
Navajo, Ne.	.80		.70									800	Red Elephant, S.	.03					.03		.03			.04	4,000		
North Belle Isle, Ne.							25.00		25.00		25.00	615	Ruby of Arizona														
Ontario, Ut.	25.00						25.00		25.00		25.00	615	Silver Cliff														
Ophir													Sonora Con.														
Plymouth	18.00			18.25	18.13	18.13					18.13	135	South Bodie, G.														
Potosi													South Bulwer, G.														
Quicksilver Pref., Ca.		24.00	23.00	24.75			5.50	4.75	5.75		5.75	525	South Elte														
Robinson Cons., Ca.							5.00					800	South Pacific														
Savage, Ne.	3.25						3.10		2.85			300	State Line, I & S														
Sierra Nevada, Ne.							1.50					200	" Nos. 2 & 3, S.														
Silver King, Ar.							6.63				6.50	75	Autro Tunnel				.17		.18		.18		.19		17,500		
Spring Valley, Ca.													Faylor Plumas														
Standard, Ca.								1.30		1.20		490	Tioga														
Stormont, Ut.													Unadilla, S.														
Tip Top, Ar.													Union Cons., G.	.95							.90		.95		800		
Yellow Jacket													Utah														

Dividend shares sold, 15,378. Non-dividend shares sold, 20,840.

have been underselling in a quiet way through trusted agents; but the general report has been, "The companies are firm to net circular." It is now clear that they are taking what they can get, and are not over-particular to conceal this fact. There is a rumor afloat that the Delaware & Hudson Company, finding this so strong, has reduced its prices to \$3.70 for Stove, \$3.40 Chestnut, \$3.15 Broken, and \$3.15 Egg, and of course somebody is remunerated for selling at these prices.

We hear of Stove at \$3.50 to \$3.70, f.o.b.; Chestnut, \$2.75 and upward; Egg and Broken, \$3 and upward.

The following table shows the amount of coal that each company was entitled to mine under its quota, the amount it actually did mine up to end of July, the amount it was under or over its quota, and the amount each is entitled to mine the present month.

It appears that all the companies except the Pennsylvania Railroad and the Erie are below their quota. These two companies have mined 706,230 tons more than they were entitled to. Of course, the Pennsylvania Railroad is the chief sinner; it keeps on steadily increasing its lead, having even last month exceeded its quota had the amount been as great as it is this month. At the present rate, it will market about 12,000,000 tons more than its quota during this year.

COMPANIES.	Per cent.	7 MONTHS OF 1885.		Under or over quota.	August quota.
		Quota tons.	Mined tons.		
Phila. & Read.	38.85	3,783,450	5,785,454	* 3,192	1,262,625
L. V. RR.	19.80	2,920,400	2,918,038	* 2,362	637,000
D., L. & W.	16.05	2,391,450	2,382,987	* 8,463	521,625
D. & H.	11.00	1,093,000	1,589,154	* 49,846	357,500
P. RR.	8.00	1,192,000	1,812,489	+ 620,489	260,000
Pa. Coal Co.	5.00	745,000	704,964	* 30,034	162,500
Erie	1.50	223,500	309,241	+ 85,741	48,750
Total		14,900,000	15,592,329	+ 692,329	3,250,000

* Under quota. + Over quota.

Bituminous.

Business in this article is still very dull, and though a slightly better demand is reported in some quarters, no noticeable improvement in business has taken place. The standard coals of Cumberland and Clearfield are still selling at \$2.75 to \$3, and occasionally a small lot is placed a little higher.

From the West, the reports are discouraging, the trade in Buffalo being greatly demoralized. The talk of arrangement between the Pennsylvania and Vanderbilt interests for the Southwest Pennsylvania Railroad has not affected the trade thus far. There is no immediate prospect of higher prices, though there

is a general feeling that trade will improve next month. The following report, dated Washington, August 20th, has appeared in the morning papers, under the heading "Enormous Coal Contract":

Dr. Mortimer Ricardo, of Caracas, Venezuela, has completed a contract with his government by which he is granted the exclusive privilege of furnishing coal to all Venezuelan ports for the use of steamers, gas retorts, and other purposes, for ten years. Hitherto, this contract has been held by an English firm, and all the coal used was sent from England. About 100,000 tons are consumed annually. Pennsylvania, it is said, will be drawn upon to supply the coal needed, and the first shipment to Venezuela will be made about the 1st of September. Dr. Ricardo proposes to remove his family to the United States, and they will reside at Washington. Meanwhile he is in New York to complete plans for transporting coal to the different ports of Venezuela.

We trust this report is well founded. Maryland or Alabama, it appears to us, would be more likely than Pennsylvania to supply the Venezuela market.

Mr. John H. Jones, official accountant, gives the following statement of the anthracite coal tonnage for the month of July, 1885, compared with the same period last year. The statement includes the entire production of anthracite coal, excepting that consumed by employes, and for steam and heating purposes about the mines:

COMPANIES.	July 1885.	July 1884.	Difference.
Phila. & Reading RR.	1,057,661	954,776	I. 102,884
Lehigh Valley RR.	562,482	488,722	I. 73,759
Del., Lack. & West. RR.	455,110	443,847	I. 11,263
Del. & Hud. Canal Co.	278,187	281,949	D. 3,762
Pennsylvania RR.	261,983	297,427	D. 35,443
Pennsylvania Coal Co.	136,145	111,520	I. 24,624
N. Y., L. E. & W. RR.	49,438	24,373	I. 25,065
Total	2,801,006	2,602,614	I. 198,391

COMPANIES.	For Year 1885.	For Year 1884.	Difference.
Phila. & Reading RR.	5,785,454	5,662,308	I. 123,145
Lehigh Valley RR.	2,918,038	3,079,365	D. 161,326
Del., Lack. & West. RR.	2,382,987	2,682,935	D. 299,947
Del. & Hud. Canal Co.	1,589,154	1,704,499	D. 115,345
Pennsylvania RR.	1,812,489	1,741,857	I. 70,631
Pennsylvania Coal Co.	704,966	701,659	I. 3,307
N. Y., L. E. & W. RR.	309,240	189,245	I. 119,995
Total	15,502,328	15,761,868	D. 259,539

The stock of coal on hand at tide-water shipping

points, July 31st, 1885, was 734,700 tons; on June 30th, 1885, 582,163 tons; increase, 152,537 tons.

Buffalo. Aug. 20.

(From our Special Correspondent.)

There is a slightly better demand for anthracite coal, and the trade reports that every thing is working quite smoothly on the surface.

The heavy rains that have occurred this season caused considerable grumbling. A dealer says that "Many car-loads of coal that have been received here were in a fearful shape, in consequence of the contents being stuck together with water. It has often come in such a condition that the dust would not screen out at all. Shippers in future must send us dry coal."

At the end of last week, the docks here were cleaned of coal in consequence of the heavy cherters that had been filled, and many vessels experienced great difficulty in procuring their quantum.

The Grand Trunk Railroad has purchased within a short time 30,000 tons of soft coal from two of our dealers; prices not made public.

There seems to be considerable delay in the purchasing of hard coal among Canadian and Western dealers, for some reason not explained.

Blossburg coal is selling here at \$4 per net ton delivered.

"The trade in bituminous coal continues very unsatisfactory and prices badly cut," says a miner and dealer; "nothing can be done or settled on a satisfactory basis until the railroads have ceased fighting."

Coke is quiet and unchanged.

Advices from Duluth announce that the "Pioneer Coal Company has been organized, and has leased what is called the Blast-Furnace docks. From 10,000 to 15,000 tons of coal are now afloat on the way here. The coal company is organized of Buffalo, Minneapolis, and Duluth capital, in connection with one of the largest coal companies of Buffalo."

The receipts at Duluth for the week ended August 15th were 20,423 tons.

A telegram received here states that prominent coal officials say that "the September output of anthracite will in all probability be reduced from 3,250,000 to 2,800,000 tons, and circular prices advanced 25 cents per ton September 1st." It is further reported that the companies "have been filling up their Western stocks at Duluth, Chicago, and other points preparatory to the winter business; but the stocks at the East are visible for every body, so there can be no hiding of coal in that section."

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 Aug. 15th to Aug. 21st, inclusive.			
		Aug. 15.		Aug. 17.		Aug. 18.		Aug. 19.		Aug. 20.		Aug. 21.					
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.				
Barclay Coal.....	50																
Cameron Coal.....	50																
Col. C & I.....	10	14 1/2	14	15 1/2	14 1/2	17	15 1/2	17	15 1/2	18	16 1/2	17	16 1/2				18,250
Ches. & O. RR.....	100	7 1/2	7 1/4	8	7 3/4												1,500
Consol. Coal.....	100			19													100
Cumb. C. & I.....	100																
Del. & H. C.....	100	84 1/2	82 1/2	87 1/2	84 1/2	87 1/2	84	87	85	87	85 1/2	85 1/2	85 1/2				10,827
D., L. & W. RR.....	50	101	99 1/2	104 1/2	100 1/2	104 1/2	102	104	102	105 1/2	102 1/2	104 1/2	102 1/2				309,686
Eliz. Lick Coal Co.....	50	43 1/2	43 1/2			45	44 1/2			44 1/2	44 1/2						2,014
Lehigh C. & N.....	50	57 1/2	57 1/2			58 1/2	57 1/2			58 1/2	58						784
L. & W. C. & I Co.....	100																
Maryland Coal.....	100																
Montauk Coal.....	100																
Morris & Essex.....	50			127		125		125 1/2									33
New Central Coal.....	100																
N. J. C. RR.....	100	51 1/2	50 1/2	51 1/2	50 1/2	51	48 1/2	50	48 1/2	50 1/2	48 1/2	49 1/2	48				33,750
N. Y. & S. Coal.....	50																
Penn. Coal.....	50																
Penn. RR.....	50	52 1/2	52			53 1/2	53			53 1/2	53						14,879
Ph. & E. RR.....	50	21 1/2	21 1/4	24 1/2	22 1/2	24	21 1/2	22 1/2	21 1/2	24	23	23 1/2	21 1/2				51,500
Spring Mountain.....	50																
Westmoreland Coal.....	50					60											19

* Of the sales of this stock, 18,700 shares were in Philadelphia and 32,800 in New York. Total sales, 443,322.
 † The quotations for these stocks are not percentage, but actual price.

The shipments of coal by Lake from Buffalo from August 13th to 19th, both days inclusive, were 59,830 (?) tons; namely, 27,040 to Chicago, 16,310 to Milwaukee, 1660 to Detroit, 1500 to Duluth, 1200 to Toledo, 2200 to Racine, 1380 to Escanaba, 530 to Ste Marie, 650 to Muskegon, and 600 to Kenosha. The freight engagements were at the following rates: 50c. to Chicago, Milwaukee, and Escanaba, 15c. to Toledo, 40c. to Duluth, 20c. to Detroit, 55c. to Racine, 60c. to Kenosha, and to Muskegon on private terms. Yesterday, freighting was again active, mostly for vessels to arrive, at old prices. There was more inquiry for Duluth tonnage, and several charters are pending. Coal is not coming forward in quantities to indicate quick loading, but that may be remedied before the craft are ready to receive it. This morning, quiet and steady.

The shipments of coal by canal for the week were 5 loads to Albany, at 95c. net, captain to pay loading and unloading; 1 load to Schenectady, at 87 1/2 c., captain to pay loading and unloading. The nominal rate to New York is \$1.15 per gross ton, captain to pay loading and unloading.

Boston. Aug. 19.

[From our Special Correspondent.]

There continues to be a light trade for anthracite coal. Retail dealers do not feel like buying when they are doing nothing themselves, while, in addition to this reason for not buying, there is the feeling, with or without proper foundation, that prices will be no higher for some time to come, and may possibly be lower.

There is a general abundance of stove coal and all domestic sizes, while nut coal is held by the companies in such large quantities as to be almost nominal in price. Broken and egg continue to be well sold up, and these two sizes are held with moderate firmness by some of the companies. The Philadelphia & Reading people insist that its stocks are not at all large, and that it can not fill its orders for broken coal. Its condition is not a true barometer of the general market, however.

Prices are low at shipping ports, and only a feeling of greater security is needed for a good trade. The September movement will naturally show some increase over the present month; but buyers are sure to continue their policy of small orders that has been in vogue all the season. As for prices, while no changes are noted, they are weak and in buyers' favor throughout the list.

There is a small trade in bituminous coal. Prices are lower for cargo lots than any contract price for a large lot that could be placed. Cargo lots are selling at \$3.35 for Cumberland or Clearfield delivered, but a contract price based on average freight rates would be \$3.50, to say nothing of the pool. The fact is, that freights are from 10 to 15 cents below the lowest average that shippers would dare to reckon upon. There are but few parties that would care to make contracts now, at any price, and they seem content to buy cargoes as needed. Deliveries on old contracts are rushed forward as fast as possible at current low freights, which will let shippers out at a profit, as most of the early contracts are believed to

have been taken at a price equivalent to \$3.35@3.45 below bridges.

The trade in provincial culm is light. Only 4389 tons have been received in the seven months from January to August, as against 12,000 tons in that period in 1884, and 28,000 tons in 1883. Probably not more than 10,000 tons will be received this year. It sells at \$2.25@2.35, delivered, and as it pays a duty of 30 cents and freight of from \$1.40 to \$1.50, there is only 55 cents for mining, railroad haul of from four to twelve miles, and—profit! As a matter of fact, the coal is only shipped here to get rid of it. It must be moved from about the mines, and there are some slight advantages in shipping it over the other method of disposal, which would be to dump it at a distance from the mines. There is a growing use for this culm in Canada, where it pays no duty and will pay a small profit, so that shipments to the States are likely to cease before long. It is used here by tanners in and about Lynn and Salem, to mix with spent tan-bark, and makes a good fuel.

Low freights continue, and are likely to rule in the immediate future. The net rate of 96 cents from Philadelphia is reported. We quote:

New York, 70@90c.; Philadelphia, \$1@1.05; Baltimore, \$1.10@1.15; Newport News, \$1@1.05; Richmond, \$1.10@1.15; Cape Breton, \$1.40@1.50; Bay of Fundy, \$1.25.

Trade is dull with retailers, and generally is from the middle of July to the first of September. Dealers occupy their teams in the delivery of contract orders. Prices are nominally unchanged. 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
 Lorberr, 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.

Mining Stocks.

NEW YORK, Friday Evening, August 21.

The mining market has shown an increased activity, and prices have ruled firmer. The transactions amounted to 45,118 shares, showing an increase of 14,398 shares, as compared with those of the preceding week.

The Standard Consolidated has issued a statement for six months to August 1st, which shows that the receipts for this period were \$108,032.99, and the expenses \$82,187.13, leaving a balance on hand, August 1st, of \$25,845.86. It is stated that the expenses would not have been so large had it not been necessary to spend considerable money in retimbering shafts and putting mills and machinery in good order. The number of shares sold was small, only amounting to 400, ranging from \$1.30@1.20. Bodie has been more active, and has ruled from \$2@1.90. Bulwer remains firm at 47c. Plymouth Consolidated holds its own at from \$18@18.33. Some sales have again been made in Quicksilver Preferred and Common, the former showing sales of 525 shares at from \$23@

\$24.75; and the latter, 800 shares at from \$4.75@ \$5.75.

The affairs of the Colorado Central Consolidated appear to be in a prosperous condition, and showed, on August 13th, after having paid a dividend of \$15,000, a balance of \$61,899.77. The work at the mines is reported as showing favorable results, and dividends may probably now come regularly to the stockholders. Very few sales were made, and the price is quoted at \$1.20. Iron Silver has been active, selling at from \$1.20@1.10. A report elsewhere shows the work now done at the company's properties. Little Chief sold at 27c. Chrysolite, at 99c.

The regular dividends of the Ontario continue to enlarge its crown of glory. The total paid to date is \$6,650,000. There has been an increased business in [the stock, which sold at from \$25@25.50. Horn-Silver remains quiet, and nothing can be learned as to the future movements of the company. The stock is firm at from \$2.20@2. Homestake has advanced from \$16 to \$16.88. A few sales of Silver King were made at from \$6.63@6.50. Moulton is steady at \$1.40.

The transactions in the Comstocks continue large. Sutro Tunnel has the greatest share, the sales amounting to 17,500 shares at from 17@18c. Hale & Norcross was lower than last week, and sold at from \$6@6.25. Consolidated California & Virginia was steady at from \$2@2.15. Savage declined from \$3.25 to \$2.85. Best & Belcher sold at from \$2.40@2.25. There was a small business done in these and other Nevada stocks, but the transactions show nothing worth mentioning.

A complete summary of the market will be found elsewhere.

The following securities were sold at auction in this city on the 19th inst.: \$6000 Ohio & Western Coal and Iron Company 6 per cent sinking fund 1st mortgage bonds, 1924, 9%; \$5000 Kemble Coal and Iron Company 1st mortgage consolidated bonds, due June, 1899, \$65 for lot.

Coal Stocks.

The better feeling continues in Wall Street, and is responded to in some degree by nearly all industries; and especially those that past experience has indicated as barometers. The market is becoming broader each day, and the belief that the worst has been passed is accepted abroad as well as here. The foreign purchases in this market during the past week have been quite large. Stocks that have hardly received attention for years, we can almost say, and which had fallen from high prices, are now purchased under the belief that a revival of prosperity in all departments of trade must greatly increase the price of any security that has been able to retain value during the severe liquidation of the past four years.

The market closed very strong a week ago, and some decline and dullness were expected on Saturday; but instead, there was a marked advance and a fairly active market. On Monday, the advance continued under a very large business, the transactions on that day exceeding 500,000 shares. The advance to this point had exceeded the expectations of every one, and a reaction that came on Tuesday was considered much overdue. This reaction was more than overcome again by the advance of Wednesday, which was followed by a further decline on Thursday. To-day, the market was quiet and fairly steady, with a stronger tendency at the close.

The coal stocks were very strong until yesterday, when the action of the Delaware & Hudson Canal Company in reducing prices caused a reaction. Prominent among these during the week under review, has been Susquehanna & Western preferred, which Deacon White, it is said, has taken up. However, the company carried 58,000 tons of coal last month, and at last has completed its coal openings, and has an easy capacity for producing 3000 tons a day. The management expects much better results under an improved condition of general business, and good street authorities speak of a much higher price for the preferred stock, and, in fact, for all the securities.

Lackawanna records sales of 309,686 shares at \$99 1/2 @ \$105 1/2, closing at \$103 1/2. Delaware & Hudson Canal was dealt in to the extent of 10,827 shares at \$82 1/2 @ \$87 1/2, closing at \$85 1/2. Jersey Central is not so much influenced by rumors of large companies purchasing a control. The sales amount to 33,750 shares at \$51 1/2 @ \$48, closing at \$48 1/2. Reading has

followed in the tracks of Jersey Central. The dealings aggregate 32,800 shares at \$24 1/8 @ \$21 1/2, closing at \$22.

Meetings.

Meetings of the following companies will be held at the time mentioned:

Copper Queen Mining Company, Nos. 37 and 39 Wall street, New York City, August 25th, at two o'clock P.M., special meeting.

Los Angeles Gold Mining, Land, and Water Company, No. 150 Broadway, Room 29, New York City, September 7th, from twelve to two o'clock P.M.

Nisi Prius Consolidated Mining Company, Leadville, Colorado, September 15th, at ten o'clock A.M.

Dividends.

Father de Smet Mining Company, of Dakota, has declared a dividend (No. 47) of twenty cents a share, payable on the 31st inst. at the office of Messrs. Laidlaw & Co., New York City.

Ontario Silver Mining Company, of Utah, has declared a dividend (No. 110) of fifty cents a share, or \$75,000, payable at the San Francisco office, or at the transfer-agency of Messrs. Lounsbury & Co., Mills Building, New York City, on the 31st inst.

Security Mining and Milling Company, of Rosita, Colorado, according to Boston papers, has declared a dividend of \$25,000, payable pro rata to the stockholders as their interests may appear on record on the 25th inst.

Pipe Line Certificates.

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

The market for the week has, although apparently steady, been qualified by an under-tone of nervous apprehension. The statistical position and absence of new wells producing oil was generally recognized as justifying higher prices, while, upon the other hand, the fear lest some one of the wells, which are coming in at the average rate of eight a day, might develop some new territory, and that high carrying rates have deterred purchasers.

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

Table with columns: Opening, Highest, Lowest, Closing, Sales. Rows for dates from August 15 to 21.

Total sales 32,348,000

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

BOSTON, August 20.

We have had quite an active market for the good copper stocks the past week, and prices show a large advance. In Calumet & Hecla, the demand from investors continues, and considerable stock has changed hands at the advanced rates.

San Francisco Mining Stock Quotations. Daily Range of Prices for the Week.

Table with columns: NAME OF COMPANY, CLOSING QUOTATIONS (Aug. 14-20). Lists various mining companies and their stock prices.

The following is the condition of the principal mining companies doing business in San Francisco on the 1st of August:

Table with columns: Company Name, Cash on hand, Indebtedness. Lists companies like Sierra Nevada, Union Con, etc.

Table with columns: Company Name, Cash on hand, Indebtedness. Lists companies like Manhattan, Belcher, etc.

* Due Sutro Tunnel Company, \$10,920. † Less \$12,800 discount.

absorbed. Quincy has been but little dealt in the past week, only 47 shares changing hands. The stock advanced from \$34 1/4 @ \$35 1/2, the same being bid for it to-day and none offered.

Napa Quicksilver Company is in demand, with sales of 400 shares this week at \$1 1/2 @ \$1 1/2.

In silver stocks, there is but very little doing, and quotations are nominal. There have been small sales of Bowman Silver at 9@10c. A few hundred shares of Catalpa at 23@25c. Dunkin is quoted at 17@20c.

at 11c. Brunswick Ship's Berth, at 25c. But there is no life in the market.

3 P.M.—The market was firm this afternoon. Sales of Calumet & Hecla at \$220. For Tamarack, \$60 bid. For Quincy, \$35 1/2. For Franklin, \$7 1/2. For Osceola, \$10 1/2.

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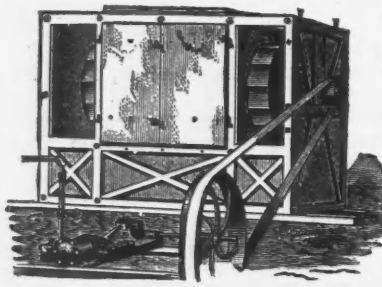


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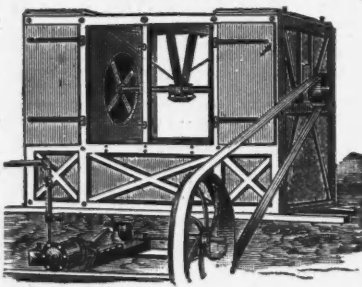
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Table listing various categories of advertisements such as Concentrators, Crushers, and Pulverizers; Air Compressors and Rock Drills; Assayers and Chemists; and many others, with corresponding page numbers.