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The thirty-fourth meeting of the American Association for the Advancement of Science will be held at Ann Arbor, Mich., from August 26th until September 1st.

A QUESTION has been raised as to the original inventor and date of invention of the water-jacket furnace for lead and copper smelting. Will our engineers please communicate their experience on the point?

The Anglo-American Club of Freiberg (composed of students attending the Royal Saxon School of Mines) asks mining engineers, metallurgists, and all those engaged in mining (especially those who have studied in Freiberg) to forward to the Anglo-American Club, Freiberg, Saxony, such papers, reports, etc., relating to mining as they may deem of interest; such papers being esteemed of great value and assistance to the mining student.

THE uses of electricity in the solution of metallurgical questions are rapidly extending. That electro-metallurgy is to be "the metallurgy of the future" is now so generally believed that no metallurgist can afford to remain ignorant of the new departure.

The Jablochkoff auto-accumulator, which we describe this week, is bringing us nearer to the long imagined point where coal will be used directly, and not through the intermediacy of the steam-engine, to generate electricity.

The condensation of metallic fumes by electricity, as elsewhere described is also an important progress.

We shall continue to keep engineers informed upon the developments made in every new application of these most important metallurgical improvements, as well as on the whole subject of electro-metallurgy in its useful applications.

A COMPANY has recently been organized in Paris to work the beds of copper ore on the Peninsula of Lower California. These beds have been exploited for years past in an irregular manner by Mexican miners, and the richer ores shipped to England. They consist of three parallel and almost horizontal layers of ore, of from 2 to 4 feet in thickness each, and cover a large area extending along the Gulf of California. The ores are oxidized, and, at any rate in certain places, of fair grade. The company proposes to expend large sums on docks, tramways, and mining machinery, and to start with a huge furnace plant. The capital of the company is large, and the promises must be in proportion. It is easy to make calculations showing enormous profits derived from an enormous plant; but, as the shareholders of the Arizona Copper Company know, it is not nearly so easy to realize them. The effect of such great schemes, with their threats of large output, will probably have a more depressing effect on the copper market than the actual yield of metal when it comes from them.

It has been resolved by the Mining Institute of Scotland to hold a mining exhibition at Glasgow, from Tuesday, September 1st, to Tuesday, September 24th, 1885. The classification of objects is as follows: Class A. Machinery, Fittings, Furnishings, and Implements; Class B. Models; Class C. Minerals; Class D. Maps and Drawings. Objects of interest connected with mining, though not included in this classification, will be received. The time set for receiving applications for space has already expired; but we think it likely that such applications may still be considered, and therefore remark that the prices inside the exhibition building are, for floor-space up to 100 square feet, 2s. per foot, with 10 per cent deduction from 100 to 200 square feet, and 20 per cent deduction above 200 square feet; for bench-space (benches provided by the committee), 2s. 6d. per square foot; wall-space, half the price of floor-space. Outside space, 6d. per square foot up to 100 square feet, and special arrangements for larger areas. The amounts thus charged will be returned to exhibitors, in whole or in part, should there be a balance over expenses. Communications may be addressed to Mr. JAMES BARROWMAN, Secretary, Hamilton, Scotland.

MR. O. CHANUTE, in his paper on the cost of railroad freight traffic, published in the *Railway Review* of May 2d and 9th, has made a timely contribution to the popular as well as the professional discussion of the railroad-rate problem. We think the whole history of the war of legislatures on the railroads shows that what the people who influence the legislatures really want is justice. That they often try to force conditions that are not just, is true enough; but that is largely due to a general ignorance of the conditions which they endeavor to control. Nothing can be more wholesome than to discover and make known, not in misleading "averages," but in detail, the cost of the service rendered by railroads in moving each class of freight. Mr. CHANUTE suggests a practical formula by which this cost may be ascertained, and the values for which may be determined by each railroad company for its own special circumstances. For purposes of illustration, he applies his formula to approximately determined data on the New York Central; and the resulting tables show that the actual cost of handling and moving different classes of freight varies from 0.42 cent to 3.11 cents per ton per mile Westward, and from 0.37 cent to 9.55 cents per ton per mile Eastward.

CIRCULAR No. 6 from the Secretary of the Institute of Mining Engineers intimates a very attractive programme for the Nova Scotia meeting, which is to begin at Halifax on the 15th of September. Arrangements are in progress for the entertainment of members and guests, including, besides the inspection of the picturesque city and suburbs of Halifax, a sail down the harbor, a drive to the Montagu Gold District, and excursions to the Pictou and Springhill coal regions, Londonderry Iron-Works, Cape Breton, the Joggins, Grand Pré (the country of *Evangeline*), etc. The government will grant to members and associates of the Institute, and accompanying ladies, free passes over the Intercolonial

Railroad. These passes will carry them from St. John, N. B., to Halifax, and from the Gut of Canso on the east to Point Levis, opposite Quebec, on the west. They will be good on any train and as often as the holder chooses, from date of issue to September 30th. The Local Committee expects also to make arrangements with other railroads, and with steamers, so that traveling within the province will be practically free. Sir ADAMS G. ARCHIBALD, K. C. M. G., late Lieutenant-Governor of the Province, is Chairman of the General Committee of Arrangements. The Secretary is Mr. EDWIN GILPIN, Government Inspector of Mines, Halifax, to whom all communications should be addressed.

We have seen a car-load of ore recently arrived from the property of the Grand Belt Copper Company, in Texas, which, from a mineralogical point of view, if from no other, is extremely interesting.

The company is beginning to open a mine in that great belt of cupriferous sandstone of Permian or Triassic age that stretches for hundreds of miles through Texas, New Mexico, and Northern Arizona into Southern Utah, and which carries in many places a small percentage of copper, and in others, as the Grand Belt Copper Company contends, a very high percentage. A careful examination of these same sandstones was made some years ago by Mr. CAZIN, and published in his report on the Nacimiento mines of New Mexico, and Dr. PETERS contributed to our pages a description of the same class of deposits as they appear in the San Andreas Mountains of New Mexico. The copper is distributed rather sparingly through beds of sandstone of considerable thickness, but in so concentratable a form that Mr. CAZIN contends that, under the favorable condition existing in the Nacimiento Mountains, ore of even one half per cent can be worked profitably. But besides these lean ores, copper occurs as replacements of the stems and leaves of trees and other vegetable forms, and fills, as glance accompanied with gypsum, the cracks of minute fissures in lignite, which, it is claimed, is in places largely developed. It is mainly this class of ores of which the car-load now in New York consists, and the quantity delivered here proves at any rate that the rich ore can be obtained in more than specimen quantities. General McCLELLAN, the president of the company, has published a report that places beyond a doubt the wide extent of the copper-bearing beds; and the yield of the company's furnace, which is now erecting at the mine, will afford reliable proof of their average percentage where now opening by the General's company.

#### THE DEFECTS OF THE MINING LAW AND THEIR REMEDIES.

It is admitted by all interested in Western mining that the mining law of 1872 is defective, that its defects lead to such complications in practice as seriously to retard the progress of mining in the territories, and to such uncertainty of title as to make capitalists shrink from the risk of investing in mining property.

The law was framed under very insufficient knowledge of the character of mineral deposits. Congress supposed all minerals to occur in veins, between well-defined walls; said veins to crop out visibly at surface, and run always in straight lines, and parallel to one another; and it further supposed that the miners would always locate their claims parallel with one another on the said parallel veins; and that every mining district would be laid out with the regularity of a chess-board.

Unfortunately for the act of 1872, or rather its victims, nature has introduced into the distribution of minerals within the solid crust of the earth almost as endless a variety as she displays in the distribution of flora on its surface; and the Western miner being in most cases not a miner at all, far less a stratigraphical geologist, and knowing little or nothing of strikes and dips, has shown as much eccentricity in locating his claims as mother nature has shown originality in distributing her gifts.

To make matters worse, the lawyer has had to be invoked. His function is to explain the law while maintaining his client's rights under the law; but if the law be ambiguous, he necessarily makes it more so by multiplying its possible meanings. His education and mental habits make him revel in intricacies, and lead him to twist even simple problems into argumentative tangles, which the honestest jury guided by the astutest judge can not unravel; and worse still, it is to his interest to trade upon the imperfections of the law. In the West, the legal profession does this in more senses than one; for it is a common practice, and not looked upon as dishonorable, for members of the bar actually to buy doubtful actions, paying a litigant in money for an interest in his case, or conducting it for a share in the proceeds. This is done even by men of standing, and where the intention is simply to use the dangers to which the opponent's property is exposed through the defects of the law and the risks of a jury trial, for forcing a compromise; and thus it has come about that what between nature, which does not conform to the law of Congress, the miner who follows nature in preference to Congress, and the lawyer who lives by complicating the discrepancies between nature and the law, the tenure of mining property has become so insecure that

a radical revision of the law of 1872, or rather an altogether new law, has become an absolute necessity.

Not even the investor knows this better than the lawyer; but the interests of the latter being in favor of the present confusion, he will not plead to Congress for a reform that would destroy his trade, and the former lacks the organization necessary to effective co-operation.

The body of all others whose duty it is to act in this matter, and whose action if unanimous would be irresistible, because of the number of its members and the general intelligence and technical knowledge of the subject that they possess, is the Institute of Mining Engineers. When the patent law of Great Britain required amending, the Society of Arts, which comprises among its members all the influential men of the United Kingdom interested in invention, took an active part in framing the new law. The Institute of Mining Engineers of this country occupies a similar relation to mining enterprise, and would confer an inestimable boon on the community by exerting its enormous corporate influence in that direction. We do not presume to say how that could best be done conformably with the purposes and proper functions of the Institute; but this is certain, that it can not be inconsistent with its duty to memorialize Congress through the proper channels on a subject so germane to its essential objects, and it is equally certain that a bill framed by a committee of its members, familiar with the mines of the West and the mining laws of other countries, aided by competent legal counsel, would embody a more perfect law than the present one, and that such a project of law will better withstand the opposition that any change in the present law, leading to its simplification, will be sure to meet with from interested quarters, than if it came before the House as a private measure.

We intend to return to this subject.

#### 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.]

#### Civil vs. Military Engineers.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: This subject, upon which you had so many excellent letters a short time ago, still seems to have called out less discussion than it deserves. I had not intended to impose upon you and your valuable space again; but some one should add a word about the subject that neither "C. U. E." nor "Spectator" nor "Observer" has as yet said.

From "Spectator's" silence, I suppose we are to assume that he concedes what, indeed, was his own argument, that, if West Point has any claims as a producer of good engineers, it is because in it, as in many of our schools of civil engineering, the process is one of "sifting out" the best until but few of the fittest survive; and since this same process is the characteristic of actual practice in competitive civil engineering work, as opposed to the routine promotion of army engineers, which goes on practically the same whether they are efficient and economical or inefficient and extravagant in the execution of civil engineering work, it follows inevitably that, even with equal talents and preliminary or theoretical attainments, the practical part of the engineer's education in the Engineer Corps, after he has left West Point and Hallett's Point, is not calculated to develop the highest engineering talent. It altogether lacks the stimulus of competition, and it has none of the "sifting out" that "Spectator" himself claims to be the very foundation of success, in securing the element out of which to make the "best engineer."

I assume that even "Spectator" now admits that his own argument proved the other side of the question that he was discussing. And, indeed, whether he admit it or not, it is beyond contradiction that the army system does not produce the same degree of efficiency or economy in engineers as the Darwinian or evolutionary system of "the survival of the fittest."

But "Spectator" says that the government or country must keep a corps of army engineers for the contingency of war, and must use them at some kind of work in times of peace. Therefore, since river and harbor improvements, the geodetic surveys, and other civil engineering work are paid for by the government, it should be done by the corps of engineers.

Now, we wholly deny the necessity of having any corps of military engineers, though all officers in the army and navy, and especially those of the artillery, should have a certain engineering training; and even if we must have the corps of military engineers, it would be cheaper for the country and better for our public works to detail its members as assistants to the civil engineers employed by contractors for public works than to allow them to design or execute those works, as they now generally do.

#### THE MILITARY ENGINEER OF THE FUTURE.

What is the use of an army engineer, any way? to come down to the essence of the question. Military engineering of to-day is essentially railroad and bridge building, the making of hastily constructed earthworks, mines, canals, telegraphs, and similar works.

Modern military engineering is confined to the moving rapidly of large bodies of men and material; the rapid and economical construction of temporary works; the manufacture and management of heavy machinery and mechanical contrivances; the manufacture and use of explosives and of electrical appliances. Now, these are all works that are the specialties of civil, mechanical, and electrical engineers, and the perfection and economy with which they are accomplished are the foundations of the reputation and of the fortune or success of the civil engi-

neer, while they are not at all, or only in a very slight degree, the qualifications of our military engineers.

The railroad and bridge engineer, the engineer of our metallurgical works and machine-shops, the engineer of our mines, of our telegraphs, and of our ship-yards are the military engineers this country will need should it ever again, unfortunately, have a great war to conduct; and when it needs these practical, trained, efficient, and economical engineers, it can command them promptly enough. True, it will have to pay them more than it does its present "Jacks of all trades;" but what would the most extravagant salaries be, compared with the cost of blunders and disasters that it would have to pay for while educating these in their unaccustomed duties in the most expensive of all schools?

Let the government in times of peace do its work by contract, as our railroad and other civil engineering work is done by individuals or companies; and in time of war, let it secure the services of the ablest specialist engineer in each class of work to design and execute the works that may then be necessary.

This is what any business man would do, and the government and armies can be best and most efficiently and economically managed by following the practice in commercial enterprises.

The corps of engineers composed, as it is, of talented and charming gentlemen, is an expensive luxury, and is wholly unnecessary either in peace or in war.

COAL AND IRON ORE PRODUCTION OF OHIO IN 1884.

By Thomas B. Bancroft, Chief Inspector of Mines.

DETAILS OF COAL PRODUCTION IN OHIO FOR THE YEAR 1884.

COUNTY.	PRODUCTION IN TONS OF 2000 POUNDS.			No. of mines.	Average time worked, in weeks.	No. of men.		Accidents.	Deaths.
	Lump.	Nut.	Total.			Miners.	Others.		
Athens	527,963	99,981	627,944	36	22	1,545	321	2	4
Belmont	538,180	194,949	643,129	41	31	1,207	225	3	1
Columbiana	401,942	67,766	469,708	43	30	882	271	1	1
Coshocton	46,425	10,137	56,562	5	43	151	24	1	1
Carroll	90,603	11,928	102,531	10	23	260	32	1	1
Guernsey	307,635	67,792	375,427	17	32	692	97	3	1
Gallia	17,512	2,860	20,372	5	38	52	8	1	1
Holmes	9,917	2,135	12,052	5	47	37	8	1	1
Hocking	315,702	56,992	372,694	22	19	715	164	1	1
Jackson	690,887	140,833	831,720	50	41	1,840	245	3	1
Jefferson	294,976	21,801	316,777	25	35	513	134	1	1
Lawrence	142,197	34,215	176,412	22	33	420	79	1	1
Medina	71,560	5,000	77,160	5	37	158	18	2	1
Muskingum	75,390	9,008	84,398	23	39	191	28	1	1
Morgan	5,764	1,872	7,636	1	28	28	1	1	1
Meigs	243,157	5,279	248,436	14	29	666	148	1	1
Mahoning	224,599	17,000	241,599	23	38	848	138	6	1
Perry	1,175,926	203,174	1,379,100	45	28	2,729	521	1	5
Portage	60,808	4,839	65,647	4	27	198	32	1	1
Summit	236,350	16,798	253,148	10	31	727	123	1	2
Scioto	3,650	.....	3,650	.....	.....	.....	.....	.....	.....
Stark	461,144	51,581	512,725	35	34	1,383	181	7	2
Tuscarawas	272,076	45,065	317,141	20	31	649	109	4	3
Trumbull	243,204	14,419	257,623	19	29	740	92	3	2
Vinton	65,743	3,997	69,740	15	39	203	56	1	1
Wayne	109,443	11,128	120,571	6	39	165	60	1	1
Washington	5,600	.....	5,600	1	25	12	4	1	1
Total	6,638,913	1,011,149	7,650,062	503	33.2	16,983	3,118	40	26

Mr. Bancroft states that probably the number of employes given is somewhat in excess of the actual number engaged in the industry, since a number of men have worked in different mines and have probably been enumerated more than once. The lives lost were one to every 294,233 tons mined. This is the first year that the collection of the statistics has been imposed upon the department by statute, and the facilities are not as complete as desired.

IRON ORE, LIMESTONE, AND FIRE-CLAY MINED IN OHIO IN 1884—TONS OF 2000 POUNDS.

COUNTY.	Iron ore. Tons.	Limestone. Tons.	Fire-clay. Tons.
Belmont	.....	1,410	.....
Columbiana	8,800	3,623	41,011
Franklin	.....	41,113	.....
Hocking	5,332	.....	10,111
Jackson	48,958	15,500	4,720
Jefferson	22,219	15,108	45,549
Lawrence	88,901	39,003	6,930
Mahoning	37,240	49,273	573
Muskingum	.....	5,960	.....
Perry	7,450	4,500	13,300
Portage	.....	.....	1,900
Scioto	9,281	6,495	17,510
Stark	.....	1,320	2,640
Summit	.....	.....	16,600
Tuscarawas	18,000	.....	8,894
Trumbull	184	.....	.....
Vinton	29,921	.....	.....
Wayne	.....	.....	230
Total	276,286	183,305	168,208

The limestone in this estimate is only what was mined for blast-furnaces.

Gold and Silver Ferns.—L. G. Doane says, in the *Microscope*: "Upon a slip of glass put a drop of liquid auric chloride or argentic nitrate, with half a grain of metallic zinc in the auric chloride, and copper in the silver. A growth of exquisite gold and silver ferns will grow beneath the eye."

ELECTRICAL COLLECTION OF METALLIC FUMES AND DUST.

Professor Lodge, of Liverpool, some time ago found, experimentally, that the effect of discharges of high tension electricity in a glass jar or other vessel containing dust of any kind in suspension was to collect or precipitate the dust quickly, leaving the vessel clear of smoke. If a bell jar be filled with a dense smoke of magnesia, by burning some magnesium wire, and a metallic point be introduced into the jar, connected by a wire to one of the poles of a good frictional or induction electric machine, it is only necessary to set the machine to work, and almost instantly the magnesia smoke begins to whirl about, and then forms itself into large flake- and strings, which rapidly settle on the bottom and sides, leaving the jar perfectly clear of smoke. What would have taken several hours to settle in the ordinary course is completely cleared and deposited in a few seconds. The same effect is produced if the jar or room is filled with any kind of smoke, that from thick paper or from a cigar being acted upon exactly in the same manner as the magnesia. Professor Lodge made experiments on rooms filled with dense smoke, and rapidly cleared them in the above manner.

These experiments suggested to Mr. Alfred O. Walker, of Chester, England, one of the proprietors of the Bagillt Lead-Works, the possibility of condensing lead fumes on a working scale in this manner, and he made the following tests:

By means of large casks, a wooden flue was constructed at right angles to one of the main flues of the lead-works, and with a damper on the main flue it was possible to make any required amount of the fumes from a group of furnaces pass into and through the wooden experimental flue. This latter was provided with glass windows placed opposite one another for the purpose of observation. It also had dampers by means of which it could be filled with the furnace fumes and then closed at both ends. The electric machine employed was on the Voss system, the glass disk being 18 inches in diameter. It was worked in a small shed erected close to the experimental flue. One pole of the machine being connected with the ground, the other was connected with an arrangement of metallic points placed inside the flue, and exactly between two of the windows above mentioned. A well-insulated copper wire led from the pole to the top of a stout brass rod, which was fixed in the top of the flue, projecting some distance above it, and reaching as far into it as was necessary to sustain the discharge points in the desired position. This brass rod was fixed inside a glass tube of considerably larger diameter, in order to insulate it where it passed through the top of the flue. During the experiments, several different arrangements of discharge points were used, as, for instance, a brass ball having spikes projecting from it all round, a ring with spikes fixed upon it pointing in all directions, a cross studded with spikes in a similar manner, etc.

PRECIPITATING LEAD FUMES.

The first experiments tried were upon the lead fume in a state of quiet; that is, the flue was filled with fume by allowing a strong current of it to pass through from the main flue and then simultaneously closing the inlet and outlet dampers. The fume thus inclosed in the chamber, when viewed through the windows, appeared as a very dense fog or mist. Left to itself, it took many hours to deposit. But as soon as the electric machine was set to work, the same action took place as with the magnesia in the bell jar. Through the windows, could be observed the same whirling movement around the discharge points, and in a few seconds the fog was seen changing into little flakes, like snow-flakes, which rapidly flew to the sides of the chamber, and were there deposited, till in an incredibly short time the "fume" had entirely disappeared from the atmosphere of the chamber, which was as clear as before the fume was let into it. Further experiments were then tried as to the action of the electric discharge on the fume in rapid motion, as it is in the flues of the works. The damper in the main flue being closed, the whole of the pressure of furnace gases was turned through the experimental flue and allowed to stream out into the air. Then the electric machine was worked as before. No effect could be seen through the windows, because the rapid current swept the fume onward too fast to allow of any change being observed at that point. But at the outlet into the atmosphere, a few seconds after the discharge of electricity began, the effect was again very striking, the issuing fume again changing from fog into flakes. A glass plate held in the current before the discharge from the machine began, was only coated, after considerable time, with a thin film. A similar plate held in the current during the working of the machine was instantly coated over with flakes and large separate specks of fume. So much was the fume agglomerated by its passage past the discharging points that, on some occasions in perfectly calm weather, some of it would fall to the ground immediately on leaving the exit opening of the flue. In short, the series of experiments proved that what took place under the bell jar took place equally in the flue of a smelting-works, with all the attendant circumstances of heat, moisture, and acid vapors.

The trials of various arrangements of discharge points seemed to show that, within certain limits prescribed by the power of the machine in use, the more points employed the better was the result, the points being spread as uniformly as possible over the cross-section of the flue through which the fumes are passing.

Engineering says that on the strength of the satisfactory results above stated, Mr. Walker decided on applying this new process of fume condensation on a full working scale at the Bagillt Works. The necessary plant is now in course of erection and nearly completed. Two electric machines on the Wimshurst system, with disks of five feet diameter, have been constructed specially for the purpose by Mr. F. J. Cribb, engineer, of Chester. They will be driven by a small steam-engine, the whole plant being placed in a small building close to the main flue of the works, through which pass all the gases and "fume" from 19 furnaces.

Mr. Walker proposes to extend the application of this process to the condensation of zinc oxide, arsenic, etc., and to introduce it in other European countries and in the United States.

The experimental results above described will certainly attract the attention of metallurgists, and if as successful as indicated, this will prove a valuable progress in metallurgy, both by reducing the heavy cost of condensing-chambers and chimneys, and by securing a more perfect condensation of those injurious fumes and smoke that frequently render metallurgical works a public nuisance.

WATER-WHEEL SETTING FOR THE HYDRAULIC POWER AND MANUFACTURING COMPANY, NIAGARA FALLS, NEW YORK.

We illustrate herewith, in four views, a water-wheel plant furnished to the Hydraulic Power and Manufacturing Company, Niagara Falls, New York, by the Stilwell & Bierce Manufacturing Company, Dayton, Ohio.

The plant consists of an iron penstock, which conveys the water from the head race to three Victor turbines, two of them 20 inches in diameter and one 17½ inches in diameter, each placed in an iron flume that receives water from this penstock under a working head of about 75 feet. Each flume is provided with a valve in its supply-pipe for shutting off the water in case access to the turbine is desired, which can be had through a suitable man-hole in the flume.

The power from each wheel is transmitted separately through suitable gears (mortise bevel) and shafting to the machinery to be driven.

The well or wheel-pit is sunk through solid rock to the depth of 75 feet, and the tail water is carried away through a tunnel to the face of the bluff, where it empties into the Niagara River.

As will be seen from the engravings, the entire plant is composed of stone and iron, and is of the most durable and substantial character.

Each of the 20-inch wheels is capable of developing 414 horse-power, and the 17½-inch wheel, 333 horse-power, making a total of 1161 horse-power.

These turbines are made of gun-metal, and are provided with a new step, which is far superior to any thing in that line heretofore used, and which obviates the serious difficulties occasioned by the burning out of steps heretofore experienced under high falls.

The Hydraulic Power and Manufacturing Company is the owner of the immense water-power already developed at Niagara Falls, and in addition to furnishing mill-sites to others, it also furnishes power and buildings to tenants, for which purpose the wheels herein described are used. At present, the power of only one of these 20-inch turbines is used; but the others will be called into requisition as the demand arises.

MODERN AMERICAN METHODS OF COPPER SMELTING.\*

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

CHAPTER VI.—CONCLUDED.

THE STALL ROASTING OF MATTE.

One of the most serious errors ever perpetrated in the manufacture of acid from pyrites is the attempted employment of pyrrhotite or monosulphide of iron for pyrite—bisulphide of iron. Aside from the greatly lessened proportion of sulphur, 36 per cent as against 53 per cent, the monosulphide will not even yield freely what sulphur it contains, but crusts with oxide of iron, turns black, and is soon extinguished when treated in an ordinary pyrites kiln. It seems scarcely possible that extensive works for the manufacture of sulphuric acid (and copper) should have been erected, their ore supply being entirely derived from a deposit of the valueless monosulphide; but such has been the case in more than one instance, and will continue to be so in enterprises conducted without the aid of skilled direction. One of the most striking instances of this kind is the old New England Chemical Company, which is said to have expended over \$200,000 in this manner, all of which was a total loss, excepting the small amount realized from the sale of buildings and lands.

Under certain conditions, the use of kilns for the calcination of cupriferrous pyrites without the production of sulphuric acid may be found advantageous, as in the case of the former Orford Nickel and Copper Company, near Sherbrooke, Province of Quebec, which, after employing heap roasting for some time, erected a large number of kilns solely for the purpose of calcining its ore previous to smelting; finding the saving in time and avoidance of waste, combined with the lessening of the annoyance formerly experienced from sulphur fumes, a sufficient advantage to repay the somewhat heavy cost of the burners.

The minimum percentage of sulphur sufficient to maintain combustion in kilns does not yet seem to have been positively determined; but with an ore otherwise favorable, it is probable that 25 per cent is quite sufficient for the purpose.

For economy's sake, as well as for the purpose of retaining the heat, kilns are constructed in blocks of considerable length, and of the depth of two burners, the front of each facing outward, while the flue in which the gas is conveyed to its destination is built on top of the longitudinal center wall. Fire-brick are used wherever the masonry is exposed to heat or wear, and the entire block of furnaces is surrounded by cast-iron plates, firmly bolted in position, and provided with the necessary openings for manipulation.

No fuel is required after the burners are once in operation; and when in normal condition, the attendance demanded, aside from the labor connected with the regular charge of from 500 to 2000 pounds of ore once in twelve or twenty-four hours, is very slight.

Much skill and experience, however, are required to maintain the regular working of the kilns, especially with ores that are not exactly suited to the process.

From five to ten per cent of fines may also be desulphurized with the coarse ore without seriously interfering with the process. They are thrown toward the back and sides of the shaft, leaving the center uncovered; otherwise, the draught is affected and serious irregularities supervene.

In accordance with the policy adopted throughout this work, no detailed estimate of expense will be given in the few instances where the author is unable to base the same on personal experience.

Such is the case in kiln roasting; but we are assured by the best authorities that the expense of calcination by this method does not exceed that of stall roasting, though the first cost of the plant is considerably greater.

The results obtained by this process are unexampled in the roasting of lump ores, although there is no doubt that a considerable share of the success is due to the fact that the sulphur is the object of interest, instead of merely being a waste product to be driven off as far as convenient.

If more than 4 per cent of sulphur remains in the cinders, as the residue from this process is called, the result is not considered satisfactory. It is needless to say that such a perfect desulphurization can not be obtained in either heap or stall roasting, nor is it necessary or, in many cases, even beneficial for the subsequent process, although, of course, in most instances the lack of sulphur in the furnace charge forms a welcome outlet for the admixture of raw fines, which may thus escape the expense of calcination.

Within the past few years, the utilization of these fines has attracted much attention, and the efforts to calcine them in automatic furnaces for the production of sulphurous acid have been crowned with success, as will be again alluded to when treating of the Roasting of Pulverized Materials.

The attempt to utilize kilns, with certain slight modifications, for the roasting of copper matte has, after many difficulties and much expense, attained a successful issue at certain European works, especially at the Mansfeld copper-works in Germany, the object in view being rather the abolition of the nuisance arising from the escape of the sulphur fumes into the atmosphere than any expectation of financial advantage from the employment of a substance so poor in sulphur for the manufacture of acid. It is obvious that only mattes comparatively free from lead and other fusible metals can be treated in this manner, and that the process of roasting is beset with difficulties that have only been overcome by the exercise of the greatest skill and patience.

CHAPTER VII.

THE CALCINATION OF ORE AND MATTE IN A FINELY DIVIDED CONDITION.

Perhaps the most marked point of difference between the roasting of lumps and fines is the time requisite for their oxidation. Oxidation is almost instantaneous for an infinitely small particle of any sulphide, and the time increases with the cubic contents of the fragment, until such a size is reached that the air fails to penetrate the thick crust of oxides formed upon the outside of the lump of ore or matte, and all action ceases.

It might seem, therefore, that the process of pulverization should be pushed to extreme limits, and that the best results would be obtained from the most finely ground ore. But this is by no means the case in actual practice; for other conditions arise that more than counteract any advantage in time. The chief of these, aside from the difficulty and expense involved in the production of such fine pulp, are, the losses in metal, both mechanical and chemical, that occur with every movement of the ore, and reach an enormous aggregate before the operation is completed; and the liability to *fritting* or sticking together in the calcining-furnace, regardless of the greatest possible care in this process. The oxidation of the particles takes place with such rapidity that a temperature is generated above the fusion-point of ordinary sulphides.

Still further objections could be mentioned; but those already adduced are sufficient to limit the degree of pulverization for the principal portion of the ore, although a greater or less proportion, according to the machinery used for the purpose, is crushed to an impalpable dust, and causes a considerable mechanical loss, in spite of all provision for its prevention.

The best size to which to crush varies with each individual ore, and is entirely a matter of trial and experience; nor should any one responsible for the calcination of any given material rest satisfied until he has determined by actual and long-continued experiment that the substitution of either a coarser or a finer screen for the size in use is followed by less favorable results.

This may be arrived at by careful comparative determinations of the residual sulphur contents after the calcination of material crushed through screens of various sized mesh and roasted for the same length of time, careful consideration also being given to the cost of crushing in each case, to the condition of the oxides of iron present (the sesquioxide is an unfavorable constituent in reverberatory smelting), and, above all, to the quantity of flue-dust formed, and loss of metal by volatilization.

It is evident that such diverse and obscure questions can only be accurately determined by extensive and long-continued trials. But the result is well worth the labor, and in these days of almost universal information and close competition, it is only by such means that any decided advantage can be obtained.

While mattes, speiss, or similar products of fusion must always be granulated or pulverized to the degree required for calcination, it is not an uncommon quality of sulphide ores either to decrepitate, or else to fall to pieces when heated, by the mere moving from place to place in the furnace, to such an extent that the charge may be made up of pieces from the size of a walnut down, without affecting either the time requisite for the oxidation or for its perfection. The product will be an almost homogeneous and impalpable powder.

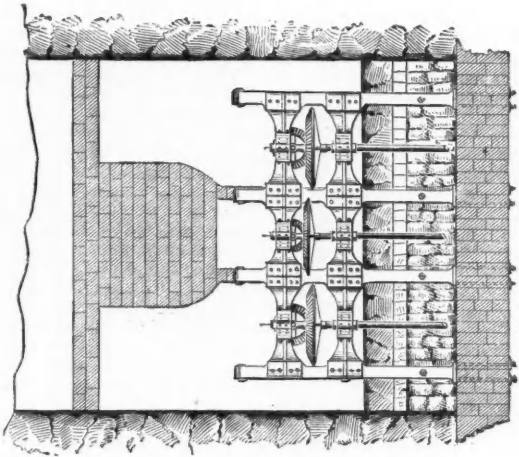
A more striking illustration of such a condition of affairs can hardly be found than in the case of the concentrates from the Parrot Company's mine at Butte, Montana.

In this instance, the process of subdivision resulted from two different causes. The iron pyrites that forms the larger portion of the ore decrepitates into very minute cubes, which are subsequently reduced to a fine powder by oxidation, while the fragments of pure copper ore—bornite—seem gradually to diminish in size by the wearing away of the surface as it becomes earthy and friable from the superficial formation of oxides.

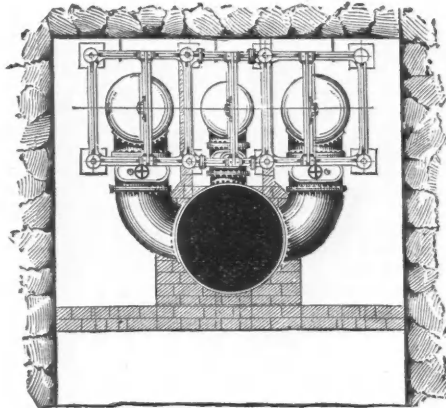
This latter phenomenon may also be observed to a less extent in the calcination of mattes when they are of a sufficiently soft or porous nature; but in roasting a considerable quantity of a very low-grade matte (from 10 to 15 per cent of copper) that had been obtained in hard polished granules by tapping into water, it was found impossible materially to alter either the size or shape of the grains, many of which were as large as an army bean, or satisfactorily to reduce the percentage of sulphur, even by long exposure to a temperature closely approaching its fusion-point.

On the other hand, quite satisfactory results are obtained in the case of richer matte (from 30 to 40 per cent of copper) by granulation in water; and in many of the foreign works, this is the only means provided for the preparation of the matte for the process of roasting; but it must be remembered that this practice is confined to the English reverberatory method, where it is not desired to remove more than 50 per cent of the sulphur by roasting, and where a proportion of sulphides still remains in

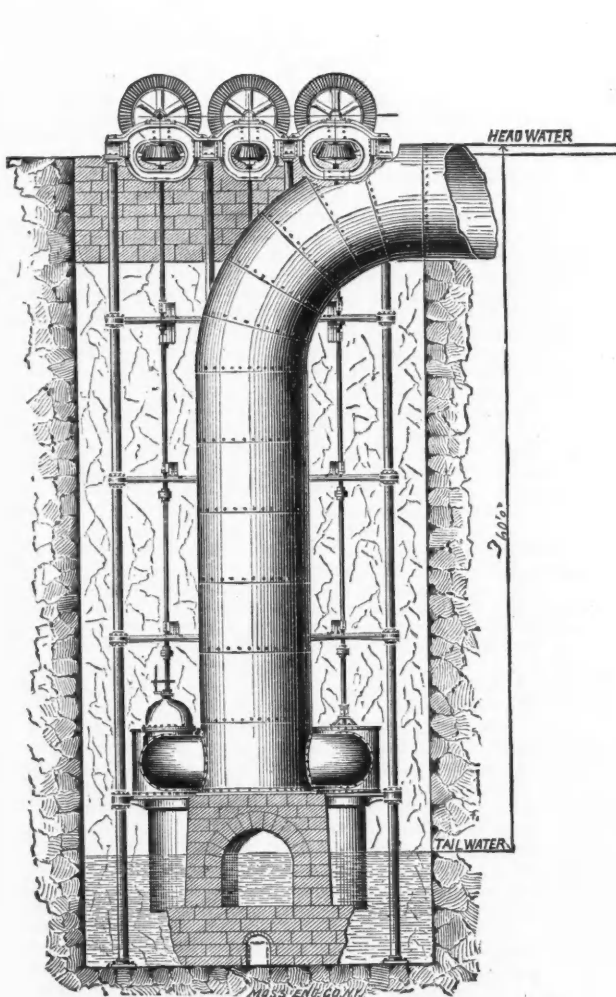
\* Copy-right, 1885, by the Scientific Publishing Company.



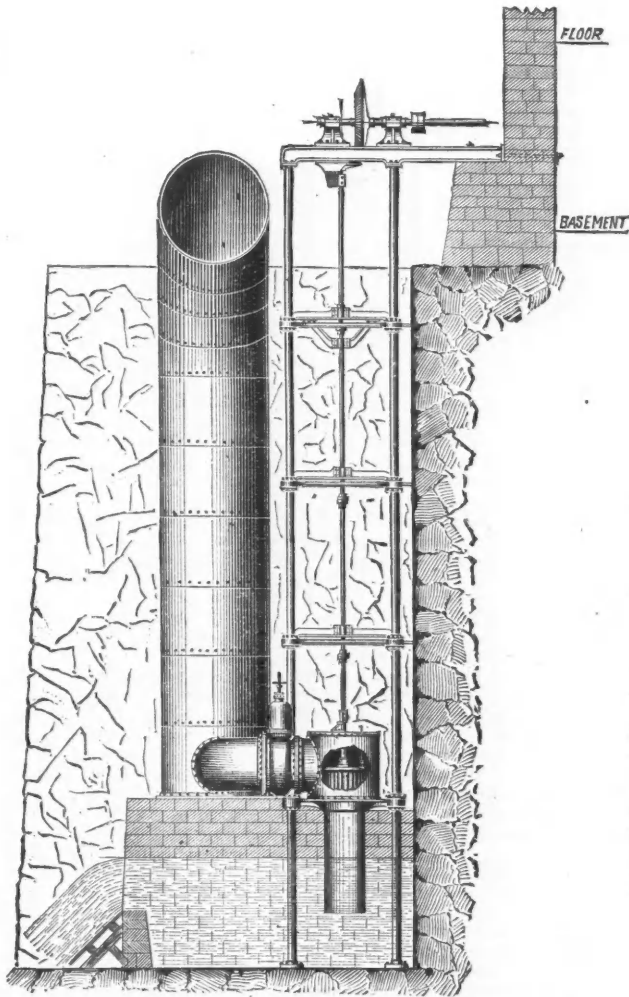
Top View of Gears and Iron Bridge-trees Supporting the Same.



Plan of Iron Penstock and Flumes for Three Victor Turbines made for the Hydraulic Power and Manufacturing Company, Niagara Falls, New York.



Side Elevation of Iron Penstock, Flumes, and Arrangement of Gears for Transmitting the Power of three Victor Turbines. Hydraulic Power and Manufacturing Company, Niagara Falls, New York.



Side Elevation of Iron Penstock and Flumes, with Side of Flume Broken Away, Showing one 20-inch Victor Turbine in Position.

**WATER-WHEEL SETTING FOR THE HYDRAULIC POWER AND MANUFACTURING COMPANY.**

the calcined matte that would be entirely unsuited to the so-called "blast-furnace" method of matte concentration in cupolas, as usually executed in this country.

Although the results described may be improved upon by careful attention to the temperature and pitch of the matte when tapped, and especially by care and experience on the part of the smelter, this practice can not be recommended, excepting under peculiar conditions and in remote situations, where improved crushing machinery is not obtainable, or where the physical condition of the matte is particularly favorable to the production of porous and friable granules. Nor is any thing gained by its employment for the purpose of avoiding the preparatory breaker, and obtaining at once a material sufficiently subdivided for immediate treatment in the final pulverizing apparatus; for although in

this practice, the larger granules are broken and crushed into a condition favorable for the calcining process, a large proportion of the entire mass is already so minute as to pass through the crushing apparatus untouched in the shape of minute spherical pellets or globules, which present the least possible surface to oxidation, and retain a hard, glossy surface. These grains are scarcely affected by any moderate temperature, and may even undergo complete fusion without any perceptible loss of sulphur. Not many years ago, the question of economy might have influenced the adoption of this practice; but at the present time, and in view of the improved and comparatively inexpensive machinery at our disposal, it is probable that the inconvenience, danger, and other drawbacks inseparable from the projection of large quantities of molten sulphides into water, and their subsequent recovery from the reservoir or whatever

vessel is employed for the purpose, more than outweigh the cost of crushing by machinery.

It is impossible to lay down fixed rules for the degree of pulverization of any material best suited to roasting. Each case must be decided according to its own peculiar conditions, including the cost of labor and power, and the capacity and quality of the mechanical means available.

Bearing in mind the results that may in certain exceptional cases come from decrepitation, it may be assumed that a reduction in size beyond one twelfth of an inch is seldom advantageous in treating ores, and that the presence of a large proportion of sulphides or of a particularly porous or friable gangue may permit an increase of the screen mesh to one eighth inch or more. With mattes, a slightly finer standard (from one twelfth to one sixteenth inch) may be employed.

The proportion of the ore reduced to a minuteness neither intended nor desired depends materially upon the means employed for crushing; and as the mechanical loss and other evils enumerated increase in direct ratio to the amount of fine dust in the charge, it is evident that, other things being equal, the apparatus best adapted to the breaking of ore or matte is that which produces the smallest proportion of fines.

(TO BE CONTINUED.)

#### JABLOCHKOFF'S AUTO-ACCUMULATOR.

London *Engineering* gives the following sketch of the theory upon which this battery is supposed to operate: The two electrodes are hydrogen and oxygen; the former is produced according to the well-known reaction, by the oxidation of a metal, such as iron or zinc; and the latter is taken from the atmosphere, and occluded in the pores of pieces of open grained carbon. This latter circumstance is sufficient of itself to impress the battery with the stamp of originality. It has long been known that carbon has the power of absorbing many times its own bulk of gases, and this quality has been taken advantage of to some trifling extent for sanitary purposes; but the idea that carbon might thus be made to act the part of a vehicle to transform the oxygen of the atmosphere into a condition in which it may be used as a battery pole, has never, we believe, been mooted before. The hydrogen is likewise deposited upon a carbon plate, which is saturated with paraffine wax, to render it perfectly dense, and prevent it playing the same part as the neighboring plate, namely, that of absorbing oxygen. Thus, we have two surfaces of carbon, one charged with hydrogen, and the other with oxygen, and these constitute the electrodes of the battery. If they be connected by a fluid medium, and coupled by a metallic circuit, a current of very considerable intensity is found to flow around the circuit, the oxygen and the hydrogen gradually combine, and the action continues until the supply of one or other of them is practically exhausted. Then, if the circuit be broken, a recuperative process immediately begins: the hydrogen is evolved from the metal, and attaches itself to the one carbon plate, while the other electrode fills its molecular interstices again with oxygen, which will be drawn out again when the electric current begins to circulate. And so the process goes on, action following rest, and rest following action, as long as the supply of metal is not exhausted and there remains the small quantity of moisture required for its oxidation. Thus, we have an accumulator in which the chemical process is not brought about by a current of electricity from an external source, but by the chemical changes in the battery itself. Hence the name given to it by M. Jablochkoff, "the auto-accumulator."

It will be seen at once that a battery to carry out this principle of action may be made in many different forms. Those at present constructed consist of shallow trays of carbon, 4 inches by 4 inches by half an inch measured externally. Within each tray, there is a small quantity of zinc filings or cuttings, covered with a layer of coarse cloth saturated with a solution of chloride of calcium, and bearing on its upper surface some half-dozen tubes of porous carbon. These tubes are about three eighths of an inch in external diameter, and lie side by side in the tray, the tubular form being adopted to expose greater surface to the air, and to afford complete access to all parts. If plates were used, the lower surface would be sealed against the wet cloth, and the air could only act on the upper side. The two poles of the cell are the carbon tray and the carbon tubes. In making up a battery, the cells are piled one above another, the tray of one cell standing on the tubes of the cell below it, and thus all the elements are coupled in the proper order, positive being connected to negative, and negative to positive all through the series. The lowest cell stands on a metal base, and over the upper cell there is placed a plate of carbon, which is screwed upon the tubes, and binds the whole column firmly together.

Many parts of the combination can be varied at will. The metal that effects the release of the hydrogen from the water may be zinc, iron, sodium, or any other that is easily oxidized. It is curious, however, to note that the electro-motive force of the battery varies with the metal used, some materials giving much better results than others. In our former notice, we published the following table of electro-motive forces, which has been fully confirmed by subsequent experiments:

	Volts for each cell.
Iron.....	1.1
Zinc.....	1.6
Sodium amalgam.....	2.2

This would appear to point to the fact that it is not the hydrogen that forms the pole of the battery, but the metal. It can be shown, however, that this view is wholly incorrect, because, when a cell has been charged, the tray may be washed out to remove all the metal, the cell put together again, and after that, it will be found that a powerful current is given off. M. Jablochkoff explains the variation on the hypothesis that the electro-motive force of a hydrogen and oxygen couple varies with the degree of density of the materials, and that, if the hydrogen were used in the metallic state and the oxygen as a liquid, it would reach a figure corresponding with that deduced from the heat of combination. It is very probable, he argues, that hydrogen prepared in different ways will be deposited in or on the carbon plate to a different degree of density or compression, and that consequently it will, in some cases, be nearer the metallic state, although a very long way distant, than in any other cases, and that, therefore, the couple will give rise to a different electro-motive

force. This view is, to some extent, borne out by the fact that the metals that give rise to the most rapid evolution of hydrogen also give the greatest electro-motive force in this battery.

The liquid medium of the cell may consist of almost any fluid capable of conducting electricity, accompanied by some material that will support the weight of the upper electrode. A solution of chloride of calcium has the advantage that it constantly absorbs moisture from the air and thus does not readily become dry. It may be used with canvas, cotton wool, sawdust, paper, or any absorbent non-conducting substance that will intervene between the two electrodes. Another substance that has been used is gelatinous silica, prepared by adding hydrochloric acid to silicate of potash. This forms both a fluid and a supporting medium for the carbon tubes.

The oxygen-absorbing electrode, the salient feature of the whole battery, and the one around which the principal interest gathers, has been the subject of very long and patient experiment to bring it to its present state of perfection. Any kind of carbon will absorb oxygen to some extent; but as the size and weight of the cells must vary inversely with the amount of oxygen that can be stored in a given mass of carbon, it follows that the price and portability, if not the practicability, of the battery must vary with the storage capacity. The tubes are prepared from finely divided coke mixed with other material that will be destroyed in the baking process, and leave the spaces occupied by it free to be penetrated by the atmosphere.

The current produced by a cell when short-circuited varies from 3 to 4 amperes, which, with an electro-motive force of 1.6 volts, equals an energy of from 4.8 to 6.4 watts. When the external resistance is about equal to the internal resistance of the battery, the current is maintained for a quarter of an hour before it shows a sensible drop, but it will last for nearly an hour without any very great diminution. When five cells are joined in series to a five-candle lamp, it is at once incandescent to its full power, and at the end of an hour the filament is still bright red, although it does not give any sensible light. An interval of a few minutes is sufficient to restore the battery to a point at which it will again bring the lamp to a fair illuminative power, although not of course to the original point. It has not yet been determined what proportion the rate of charge bears to the rate of discharge, but it is certainly as fast, and it appears as if it were faster.

It is somewhat difficult at this stage to speak definitely of the future of this battery; but this much at least is certain, that it appears likely to displace very many that enjoy a considerable popularity. Its advantages are evident even to those who have no technical knowledge of electricity. The total absence of all fumes and acid liquors, the freedom from corrosion consequent upon there being no metallic connections between the cells, the immunity from "creeping," and the permanent nature of the tray, appeal at once to all who have ever used batteries for ordinary purposes, such as ringing bells, working telephones, and the like. But the inventor has more ambitious views than this, and looks more particularly to the production of motive power as a field for his battery. There is a very genuine demand for a domestic motor, one that will be cheap, although not necessarily as cheap as the steam-engine, and it is toward this end that he is working. He calculates that an electrical horse-power can be produced for about one halfpenny an hour if the metal used be iron, and that, after all the incidental losses peculiar to small motors have been added, the cost would still be insignificant, and within the means of the ordinary householder. Domestic lighting is another purpose that will occur to every one as a field for this battery, and the one for which it would find the largest opening in this country.

To whatever use it is applied, however, it needs that there shall be a double set of apparatus, one to be resting and recuperating while the other is at work, and a self-acting switch to effect the exchange of the two automatically at short intervals. From time to time, of course, the battery must be cleared; the zinc salt must be washed out, and the cloths re-wetted; but the process involves no handling of acid, and is within the comprehension of the most unscientific person. Altogether, the invention starts with the fairest promise, and there is every reason to believe that it has a wide future before it.

**The Transcaucasian Coal-Field.**—The Russian journals speak of great activity in the Transcaucasian coal-field. The mines of Triboul will be connected with the Batoum branch of the Transcaucasian Railroad, and an output of 40,000 tons of coal is counted upon for this year. The mines are the property of Mr. Novosselsky.

**Cutting Glass Tubes by Electricity.**—An iron wire  $\frac{1}{4}$  mm. in diameter is wound around the tube at the place required to be cut, and the ends are connected by means of copper conductors of the same diameter with the poles of a powerful battery or other generator of electricity. This iron becomes heated when the current flows, and it is only necessary to cool it suddenly with a few drops of cold water, in order to produce a clear cut. Glass tubes four inches in diameter are now cut in this way.

**Water and Coal.**—The statistics of production for the year 1884 show that in the district of Saint Etienne, France, the average quantity of water raised from the collieries was 2.3 tons to the ton of coal. The maximum proportion was at Monthieux, where it rose to 13 tons of water to the ton of coal. In the district of the Rive de Gier, the average was 7 tons of water to the ton of coal, the maximum being 15 to 1, which occurred at the pits of the Compagnie des Houillères of Rive-de-Gier.

**Thibet Gold Mines.**—Colonel Prejwalski, the well-known Russian explorer of Central Asia, writes to the Geographical Society at home that he has discovered gold mines, worked by the natives of Thibet, so extensive that he ventures the opinion that this country will prove the equal of California in this precious mineral. Near the head of the Hoang-ho, on the southern slope of one of its tributaries, he came across some thirty Tawgots engaged in a rough sort of placer-mining, taking the gravel from a depth of only one or two feet, and yet, as a result of this ancient method of obtaining the gold, the natives had great quantities of the mineral in large pieces, none of them being smaller than a pea. Of course, civilized handling of the deposits would make such gravel pay enormously at small outlay, and the deposits are of the most extensive character, the whole northern part of Thibet being rich in such areas.

BUTTE, MONTANA, NOTES.

Correspondence of the Engineering and Mining Journal.

President Adams and several officials of the Union Pacific Railroad system visited this town and Anaconda a week or ten days ago, and it was hoped that some concessions on freights would be obtained from them; but so far, no change has been made. The copper men have no reason to complain of the freights charged on their products, \$18 on ore and \$20 on matte per ton to New York being very reasonable; but a reduction of freights on coke and coal, and on some ores mined in distant parts of the territory, which could be advantageously worked with those of Butte, would be of material assistance to the industry. The silver men complain, with reason, of the charges on salt, the freight on that commodity from Salt Lake, a distance of less than 500 miles, being \$20 a ton. Such a charge can not be defended when the same railroad company mines its own coal and delivers it from a greater distance at \$8 a ton. As is usual in such cases, this illiberal policy is reacting on the company. The ores here require large quantities of salt, some of the roasting mills using less than ten and some of them from sixteen to eighteen per cent. The expense of this item leads to many low-grade ores being left in the mines, which, under better conditions, would be worked, and lead to the erection of additional stamps. It is also compelling the mill-owners to adopt various means to reduce its use. The Moulton and Silver Bow companies effect this by purchasing oxidized ores to mix with their own. The Lexington Company is building new furnaces to save the use of salt by a preliminary roasting of the ore. Should this change prove economical, it will be generally adopted, and lead to a great reduction in the use of salt, and consequently of freight, to the railroad. The copper men here have come to the conclusion that the bottom of the copper market has been reached. Should that be the case, the Butte miners have no reason to be dissatisfied. Profits will not be so large as they hoped when they began their works; but they can hold their own, and obtain a very fair remuneration for the capital invested. In the mean time, they are studying economy in all their processes, and many improvements are under consideration, and have, in some cases, been introduced. As our ores are more refractory, and have to pass through more processes than most others before finally reaching their market, any improvement in mining, smelting or refining must redound more to our advantage than to that of any of our rivals in copper production.

The Anaconda is running about as usual. The large building for the vanners is completed, and in a short time a large quantity of slimes now run off into the tailings-beds will be profitably treated. The new calciner building is also completed, and good progress is made with the railroad track that is to supply it with ores and fuel.

The Parrot Company is working along smoothly, and is putting out about 15 tons of black copper daily, besides some high-grade matte. It is stated that the company or some individual members of it will erect refining-works in Connecticut, the matte to be refined by the electrolytic process. In this case, as its own ores carry enough silver to pay the expense of separation by this method, it is hoped the company here may determine to enrich its matte and become a purchaser of silver ores.

A new furnace is erecting here by some of the employes of the Parrot Company, to treat custom ores. Apparently, they will start on a very modest scale, and it is, perhaps, open to doubt whether they can stand the competition of the large companies should they begin to buy ores. Their enterprise, however, has the good-will of the camp, as every thing that tends to secure a market for the argentiferous copper ores of the district is a benefit. There are several mines producing or that could produce this class of ore, notably the Cora, Clear Grit, Gray Rock, Gem, Gambetta, and others. The Cora, which has just resumed work, was, down to water-level, a very productive silver mine; but from that point, it carried too much copper to be worked by amalgamation, and too much silica to be a desirable smelting ore, while more easily treated ores were handled by the only company then buying them. There being, however, a probability of a greater demand now, the owners have again begun work. The main body of the ore carries about 5 per cent of copper and 30 ounces of silver; but there is a chute of considerable length in the mine of very much richer ore. The Clear Grit, when under lease to the Colorado Smelter, produced 20 tons daily of ore very similar in character and grade to that of the Cora, and is now producing a much richer ore in smaller quantities, the owners preferring to leave the second grade in the mine until they can obtain better prices. The Gray Rock, also worked for some years as a silver mine, shows now a very large body of ore of similar grade and character. The others mentioned have not been sufficiently developed to give any notion of their possible production; but the three described above are capable of easily producing between them 80 or 100 tons of ore a day. They seem peculiarly adapted to some of the leaching processes, and might be worth investigation by any of your readers interested in such matters. The Wild Bill is another very productive mine of somewhat the same class; but its ores carry more copper and iron, and consequently find a readier market.

Mr. Clark has started up his blast-furnace on Clark's Colusa with very satisfactory results during the last few days. Hitherto, the concentrates from this mine have, after calcination, been sent to the Colorado Smelter, and there converted into matte. The output of the furnace will be from 10 to 12 tons daily. Mr. Clark uses the O'Hara furnace for calcining purposes. This, although it may not give as clean a result as a reverberatory, saves much labor. Calcining has hitherto been a very heavy part of the expense of treating Butte concentrates, the cost at most of the works being from \$3 to \$4 a ton, and it would seem that, in this department, there is a field for economy that would well repay attention. Mr. Clark's O'Hara is one step in this direction. The Anaconda Company has tried a Bruckner cylinder, and it is said to be about to erect some new ones of very large capacity, to more fully test their value.

Concerning silver matters, a satisfactory report may be made. The larger mines are running steadily as usual, and several new prospects have been started up. The North Star and Salisbury Consolidated mines have been leased. Their properties produced from 8000 to 10,000 tons of medium grade ore some years ago, but were badly worked and

caved in. The lessee is required by the terms of his contract to sink a new double-compartment shaft 150 feet.

The Pollock is to be started up by Mr. Clark, the owner. The mine was worked down to water-level last year under lease, and paid \$5000 in royalties. The Ohio, to the west on the same lead, is worked by Mr. Daft, under lease and bond; and the second extension to the east is opening by Mr. Roach and others. All the locations on this ledge, seven or eight in number, have shown rich ore.

The Patsy Clark syndicate, as it is called here, which is supposed rightly or wrongly to be composed chiefly of the owners of the Anaconda, has purchased the remaining interest in the Belcher, a western extension of the Alice and Moulton, and now owns the entire claim. This last interest was bought by it at the rate of \$50,000, the other interest having been secured previously at smaller figures. This syndicate now controls, either by purchase or bond, the Goldsmith No. 2, the Nonesuch, the Belcher, the Bachelor, and several other claims, making a solid block of ground of considerable area.

Mr. Tong, owner of a half-interest in the Goldsmith, has taken up the bond on the other half, the price paid being \$20,000. It is understood that the product of the shaft and levels alone paid nearly all the purchase money as well as all the mining expenses and a considerable royalty under the lease.

No mill has yet been ordered for the Bluebird, and as it is rather late to begin this season on a large mill, it is probable that no move in this direction will be made before next spring. This mine, which was purchased some months ago by Mr. Van Zandt, of New York, for \$100,000, has been the greatest success of the season. The ore-chute is 1200 feet in length, and the product now on the dump from driving the two levels and making air connections is estimated at 8000 tons of ore, which by mill sample carries from 40 to 50 ounces in silver. The mine is nearly three miles west of Butte, and has drawn attention to a part of the camp hitherto unduly neglected and has led to the opening up of various very promising prospects, of which I may write at some future day.

BUTTE CITY, MONT., July 6.

MINER.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

GRANTED MAY 5TH, 1885.

- 316,963. Metal-Heating Furnace. William Hartt, Portsmouth, Ohio.
- 316,967. Safety-Shield for Gas-Mains. Robert Heber, Titusville, Pa.
- 316,982. Apparatus for Shipping and Transferring Coal, Salt, etc. Adolphus E. Large, Birkenhead, County of Chester, England.
- 316,993. Apparatus for Carbonizing Incandescents. Otto A. Moses, New York City.
- 317,000. Joint for Natural Gas Conductors. Joseph N. Pew, Pittsburg, Pa.
- 317,010. Phosphate Fertilizer. Walter S. Pierce, New York City, Assignor to Evelina D. Pierce, same place.
- 317,060. Apparatus for Extracting Paraffine from Oils. Robert A. Williams and John Bragg, Cleveland, Ohio.
- 317,062. Facing or Molding Material for Molds for Casting Metal. Carl Wittenström, Stockholm, Sweden.
- 317,063. Casting Apparatus. Carl Wittenström, Stockholm, Sweden.
- 317,064. Metal Mold for Castings. Carl Wittenström, Stockholm, Sweden.
- 317,069. Safety Apparatus for Condensing Engines. C. C. Worthington, Irvington, New York.
- 317,101. Apparatus for Forming Molds for Casting Metal Pipe. Jacob K. Dimmick, Newport, Ky.
- 317,113. Friction-Clutch for Rock-Drills. George M. Githens, Brooklyn, New York.
- 317,129. Process of Preserving Wood. Ludvig Hansen and Andrew Smith, Wilmington, N. C.
- 317,184. Grate for Furnaces. Levis Passmore, Philadelphia, Pa.
- 317,192. Ore-Separator. John C. Porter, St. Louis, Mo.
- 317,227. Pulverizer. Alonzo Skinner, Warren, Mich.
- 317,245. Apparatus for the Separation of Gold from its Ores by Electro-Chlorination and Deposition. Edward P. Thompson, Elizabeth, New Jersey, Assignor of three fourths to Edward P. Roberts and G. H. Pierce, both of Cheyenne, Wyoming.
- 317,246. Apparatus for the Electro-Deposition of Gold from its Chlorides. Edward P. Thompson, Elizabeth, New Jersey, Assignor of three fourths to Edward P. Roberts and G. H. Pierce, both of Cheyenne, Wyoming.
- 317,263. Appliance for Regulating the Blast-Pressure of Converters. James P. Witherow, Pittsburg, Pa.
- 317,264. Method of Regulating the Blast-Pressure of Converters. James P. Witherow, Pittsburg, Pa.
- 317,283. Conduit for the Conveyance of Gas under Pressure. Harvey Bartley, Pittsburg, Pa., Assignor of one third to J. F. Steel, same place.
- 317,287. Machine for Making Drills. William Y. A. Boardman, Hyde Park, Mass.
- 317,336. Drill. Joseph M. Glenn, South English, Iowa, Assignor of two thirds to David N. Coffman and Jonathan F. White, same place.
- 317,359. Quartz-Mill. Charles J. Hodge, Houghton, Mich.
- 317,408. Means for Preventing Leakage of Gas from Mains. Henry Moeser, Pittsburg, Pa.
- 317,427. Press for Flanging Sheet Metal. Ralph Hart Tweddell, Westminster, County of Middlesex, and James Platt and John Fielding, Gloucester, County of Gloucester, England.
- 317,439. Grate-Bar for Furnaces. James Burrell, Bristol, County of Somerset, England.
- 317,444. Apparatus for Burning Volatilizable Hydrocarbons. Hector de Bay and Charles de Rossetti, Cairo, Egypt.
- 317,478. Blast Appliance for Converters. John F. Wilcox, Pittsburg, Pa., Assignor to Henry W. Oliver, Jr., and James P. Witherow, both of same place.

REISSUE.

- 10,594. Metal-Rolling Machine. John Beavis, Cleveland, Ohio.
- GRANTED MAY 12TH.
- 317,533. Process of Casting Metals. Martin P. Hayes, Chicago, Ill., Assignor of one half to Frederick Mortimer Atkinson, same place.
  - 317,585. Machine for Cross-Turning Sheet Metal. Van Schaick Sharp, Weedsport, New York, Assignor of one half to Wallace W. Holcomb, same place.
  - 317,611. Apparatus for the Manufacture of Vaporous and Gaseous Fuel and Illuminating Gas. Richard B. Avery, Washington, D. C.
  - 317,621. Ore-Concentrator. Norman Fuller, Ennis, Montana.
  - 317,761. Earth and Coal Loader. Daniel J. Gilchrist, Newark, New Jersey.
  - 317,781. Casting Rolls. James Hempbill, Pittsburg, Pa.
  - 317,796. Chlorine-Gas Washer. John A. Just, New York, Assignor to himself, Lewis F. Phillips, Watertown, and Callie F. Gibbs, Brooklyn, New York.
  - 317,807. Sheet-Metal Vessel. Isaac S. Lauback, Boston, Mass.
  - 317,823. Apparatus for Generating Carbon Dioxide. J. McEwen, Manchester, England.
  - 317,852. Furnace. Josef Reulaux, Pittsburg, Pa., Assignor of one half to Charles August Hoyer, same place.
  - 317,857. Device for Folding the Edges of Wire-Cloth, Sheet Metal, etc. Morris F. Roberts, Philadelphia, Pa., Assignor of one half to Shimer & Co., same place.
  - 317,916. Cold Air Blast for the Protection of Nail-Makers. Jacob Altmeyer, Benwood, West Va.
  - 317,928. Nail-Making Machine. Charles W. Cugin, Lynn, Mass.
  - 317,935. Smoke-Preventing Furnace. George Farr and Albert B. Seward, Cincinnati, Ohio; said Seward Assignor to Edward W. Farr, Peoria, Ill.
  - 317,949. Rock-Drill. Benjamin A. Legg, Columbus, Ohio, Assignor to Joseph A. Jeffrey, same place.
  - 317,952. Safety-Valve and Alarm for Steam-Boilers. William B. Railing and Charles N. May, Mechanicsburg, Pa.
  - 317,953. Apparatus for Manufacturing Gas. Aaron F. Randall, Washington, D. C., Assignor of one eighth to Carlos B. Randall, same place.

## FURNACE, MILL, AND FACTORY.

After a year's negotiations, the three electric light companies of Boston, Mass., have determined on combining their forces. The companies are the Brush Electric Company, the New England Weston Electric Company, and the Merchants' Electric Light and Power Company. The combination will be the Union Electric Light and Power Company of Boston, and is to be organized under the general laws of Massachusetts, with a capital of \$700,000.

The Bessemer Steel-Works and the Albany Iron-Works, of Troy, New York, have resumed operations.

The recent test of an electric head-light on the locomotive Robert Sayre, one of the largest engines running over the New York division of the Lehigh Valley Railroad, has been a success. The light was temporarily discontinued, owing to a conflict with the Pennsylvania road. As soon as the difficulties have been settled, the light will be used again, and will also be put on other roads.

The Pottsville Iron and Steel Company, Pa., will erect a Clapp-Griffiths plant of two converters, the work to be completed by October 1st. The mill hereafter will make structural steel of all kinds, beams, channels, angles, and bridge steel. It was built originally to make rails. The contract for this work has been given to J. P. Witherow.

The Pittsburg Steel Casting Company, Pa., is making three large gear-wheel rings, weighing eleven thousand pounds each. These wheels are the largest they have ever cast in steel, being about 10 feet in diameter and 18 inches face, having 93 teeth with about 4 inches pitch. They are to be shipped to San Francisco.

The property of the Ore and Steel Company, better known as the Vulcan Iron-Works, situated in South St. Louis, Mo., has been leased to a syndicate of Ohio gentlemen. The order provides that the lease shall run for six years at an annual rental of \$50,000 a year, the lessees to have the right to use the Bessemer process. The lessees are A. M. Wilcox, of Cleveland; H. O. Bonnell, Henry Wick, F. H. Wills, L. E. Cochran, Richard Brown, all of Youngstown, O.; and H. Whippert, of Terre Haute, Ind. The works will be ready to open up by August 1st, with a force of between 400 and 500 men, all under the management of Mr. Goldstein, the old superintendent.

To the Water and Gas-Works Construction Company, of Pittsburg, has been awarded the contract for erecting a steel stand-pipe at the Aurora, Ill., water-works. The pipe is to be 152 high and 18 feet in diameter.

Moorhead & Co., of the Soho Rolling-Mill, Pittsburg, Pa., have just completed what is said to be the largest heating-furnace in the world, and said to be capable of holding 50 tons of iron.

On the 13th inst. molten iron burst out at the back of the stack at the Bird Coleman furnace at Cornwall, Pa., and destroyed the hoisting-engine house, together with the machinery. The furnace is idle. It has been making on an average about 600 tons per week. The damage thus far amounts to \$6000.

The Kittanning mill, Pittsburg, Pa., started up on the 13th inst. under the management of James Neel. The works have been idle for six months, and will resume only in the puddling departments, the product, it is stated, to be used by Graff, Bennett & Co. to help them out on their large orders for pipe iron.

Shoenberger & Co.'s new mill at Pittsburg, resumed operations in some departments July 13th.

The old Keystone Mill, now owned by Lindsay & McCutcheon, is reported to have been leased by the National Tube-Works Company, of McKeesport, Pa. The establishment will be put in good repair and started soon.

The Clapp-Griffiths steel plant, at Oliver Brothers & Phillips's works, at Pittsburg, Pa., is closed for the purpose of getting ready to use a new and large cupola that will enable them to run double turn and greatly increase the output.

The main office of the Repauno Chemical Company, manufacturers of Atlas powder, has been removed from Philadelphia to Wilmington, Del.

Extensive improvements are now making and experiments trying at the Glendon Iron-Works, Easton, Pa. A large engine-house is erecting at the company's ore mines to cover a locomotive of immense size, which will furnish the smaller engines at the mines with hot air, and thus dispense with the use of fuel. The experiment is in making wrought-iron. The molten iron

is carried from the furnaces, placed in a cupola, puddled, and then forced from the latter to beds by means of cold instead of hot blast. Several successful trials have been made, and it is believed that the company will soon erect works to manufacture wrought-iron on a large scale. No. 3 furnace is ready for blast, but will not be lighted until No. 2 is blown out for repairs. The company's furnace in South Easton is still idle, and the indications are, that it will not be put in blast this year.

During the week ended July 11th, the daily output of finished iron at Pittsburg, Pa., including steel rails, reached about 1500 tons, which is an increase of from 75 to 100 tons a day.

The Adirondack Steel-Works, in Jersey City, New Jersey, which employ over one hundred hands, closed on the 15th inst.

Capitalists of Columbus, Ohio, are organizing a stock company for the purpose of establishing a nail factory there. The plan is to purchase the machinery of a factory now in Pittsburg, and remove it to Columbus.

The Wheeling Steel-Works have been formed at Wheeling, by the Belmont Nail Company, the Benwood Iron-Works, and the Wheeling Iron and Nail Company, with a probability of the La Belle Iron-Works also becoming a subscriber. The companies named are all manufacturers of nails, and will have an equal share in the proposed steel-works, which will be a Bessemer plant with two 5-ton converters. The steel-works will be constructed of sufficient capacity to supply the four nail companies with all the steel they will need.

A fire on the 16th inst. destroyed the rolling-mill at the Baltimore Copper-Works at Canton, where the fire department does not go. The damage is estimated at \$25,000; only partially insured.

## LABOR AND WAGES.

The Coal Miners' National Executive Committee, in session at Pittsburg, Pa., on the 15th inst., issued a call for a national convention of coal miners, to be held at Indianapolis, Ind., Wednesday, September 9th, for the purpose of establishing a national union and inaugurating a movement to advance mining rates.

A meeting at Birmingham, Ala., on the 15th inst., of delegates from various bodies of miners near that city, organized a movement against convict labor. A State organization will be effected, and the co-operation of other Southern States is assured.

The United Nailers of America, at session in annual Convention, at Wheeling, West Va., on the 15th inst., agreed to consolidate their organization with that of the National Heaters and Rollers' Union. The name will be changed and new rules adopted.

The strike at the salt-works at East Saginaw and Bay City, Mich., continues, and the militia has been sent to the various works to protect the property. Some of the strikers have been arrested.

The Cleveland Rolling-Mill Company, of Cleveland, Ohio, has decided to keep the entire works closed until such time as the employees desire to return peaceably to work in all their several departments. The company desires to continue shipment of material now on hand, and for the peaceable performance of this has asked for a sufficient force of police to amply protect the men thus employed in shipping and for the protection of the plant.

The wages of sheet-iron workers at Pittsburg, Pa., may cause some difficulty before a final settlement is reached. There is some dissatisfaction at a number of mills, which has resulted in a strike at A. M. Byers & Co.'s works, and other strikes may follow this week. The trouble is caused by the failure of the firms to classify their mills. At the wages conference, it was decided that plate and sheet mills be classified at once. This many firms failed to do, and considerable trouble will be the result.

## TRANSPORTATION NOTES.

Samuel B. Dick, of Meadville, Pa., has been appointed receiver of the New York, Pennsylvania & Ohio Railroad.

The ordinance granting right of way to the North Shore Railroad from Government lock No. 1 to Four-Mile Run has been passed by both branches of the Pittsburg City Council over the Mayor's veto. The road is to connect the Pittsburg, Cincinnati & St. Louis Railroad, owned by the Pennsylvania Company,

at Try street, with the main line of the Pennsylvania road at Braddock, ten miles east, and will be an important acquisition to the Pennsylvania road, its lines forming a net-work around the city and enabling it to reach all the manufactories.

Counsel for the Jersey Central Railroad Company have filed a petition in the United States Circuit Court at Pittsburg, asking for the restoration of the road from the hands of the Philadelphia & Reading Railroad. Counsel for Reading asked delay in filing answer until the 5th of next month. Judge McKenna granted the order asked for by the Central director. In the mean time, the receivers of the Reading Railroad Company have stopped forwarding the Jersey Central treasurer any of the earnings of the latter company, and will continue to withhold the earnings pending the suit.

The projected North Shore Railroad is meeting with vigorous opposition from the river coal operators, who, up to the 15th inst., according to reports, had raised \$4000 to defray the expenses of litigation here, also of a commission to Washington, on the ground that the new road will encroach on government property in the shape of Lock No. 1. The new road will prevent the landing of coal along the Pittsburg side of the Monongahela River.

## COAL TRADE NOTES.

## ALABAMA.

During June, the Pratt mines, near Birmingham, it is stated, produced 46,000 tons of coal and 7000 tons of coke.

## BRITISH COLUMBIA.

The report for 1884 of the Inspector of Mines shows that the following collieries were in operation during that period:

Nanaimo colliery, belonging to the Vancouver Coal Mining and Land Company, Limited.

Wellington colliery, the property of Messrs. Robert Dunsmuir & Sons.

East Wellington colliery, owned by Mr. R. D. Chandler,

The Alexandria colliery, belonging to the Esquimalt & Nanaimo Railroad Company.

The aggregate output of coal in the year 1884, from the collieries, amounted to 394,070 tons, which, with 1830 tons in stock on January 1st, 1884, made a total of 395,900 tons of coal available for export and home consumption.

The coal exported during 1884 amounted to 306,478 tons, of which the principal part was shipped to San Francisco and southern ports in California; various shipments were also made to Portland, Oregon, to Washington Territory, to Alaska, to the Hawaiian Islands, and to China, and supplies were furnished to steamships and vessels calling.

The local consumption of coal in 1884 was 87,388 tons.

The exports of 1884 show an increase of 156,911 tons over those of 1883, while the local consumption for 1884 is upward of 20,000 tons more than that of the previous year.

The inspector concludes: On the last occasion of my addressing you, I had to account for a decrease in the output and exports of 1883, as compared with those of 1882. The output shows an increase of upward of 180,000 tons above the output of 1883.

## COLORADO.

The Colorado Coal and Iron Company is putting up crushing machinery at its coke-works. It expects to make a better quality of coke by so doing. The company has 10,000 tons of good coke piled up on its docks ready for shipment, and is running 150 of its ovens.

## ILLINOIS.

The Maxwell Coal Company, of Peoria, has been organized to mine and sell coal; capital stock, \$20,000; incorporators, Valentine Ulrich, Charles E. Ulrich, and George Noll.

The United States Coal, Iron, and Lumber Company, of Chicago, has been organized to mine coal and iron, and to deal in the same, and to produce and sell lumber; capital stock, \$500,000; incorporators, S. C. Coffin, J. P. McElvey, and Edward H. Brown.

## OHIO.

Advices from the Perry County coal-fields represent matters to be in a bad condition in the vicinity of Corning, a place that a year ago was a flourishing town in the heart of the coal region. The dull times



inaugurated nearly a year ago by the closing of the Ohio Central coal mines have been steadily increasing, and have been added to by the litigation between the Ohio Central and the Sunday Creek coal companies. The locality is now almost deserted. A new shaft has been sunk on the Rodgers property, near Corning, but on account of the litigation referred to, nothing is done.

**PENNSYLVANIA.**  
**ANTHRACITE.**

The slope caved in at Bickel's colliery, near Centuria, on the 10th inst., while the colliery was in operation. One hundred men were in the mine at the time, but all escaped through the air-way. The loss is about \$9000.

Work in several of the Philadelphia & Reading Coal and Iron Company's collieries, in the neighborhood of Shenandoah was stopped at noon on the 9th and 10th inst., owing, it is said, to the scarcity of cars; but the miners allege there is another cause for it. The collieries began to work full-time on July 1st, and the miners say the stoppages are a part of the old programme of short time. They say the collieries can ship nearly three fourths as much coal by working half-time as they can when working full-time, and they are complaining bitterly of the stoppages.

The Ebervale coal mine, at Wilkes-Barre, was closed on the 14th inst. by the inspector, fears being entertained that an accumulation of water in another mine might break through.

**BITUMINOUS.**

The old Sheridan coal-works, a short distance above Ironton, were recently offered at public sale, but received no bids.

A dozen loaded coal cars at the head of the Hampton Coal Company's incline at Wilkinsburg were cut loose on the night of the 14th inst by some person, and went down the long grade with a terrific crash, demolishing a building, the trestle-work, and coal tipples belonging to the company. It is suspected that the reduction in the mining price last Saturday is the cause of the destruction of property. The company's loss by the wreck is \$6000, and the mines will be stopped until repairs are made.

**COKE.**

Coke trade prospects have not improved, says the Connellsville Courier. On the contrary, things look a shade less hopeful. Most of the furnaces in blast are stocked with coke, and none of the idle stacks shows signs of blowing in. The strike at Cleveland has reduced the syndicate shipments 35 cars, that being the daily consignment to the Cleveland Rolling-Mill Company. There has also been a slight falling off in outside shipments. The syndicate now ships 485 cars each working day, or 2435 cars a week; the independent operators ship 975 cars a week; the average daily output of the region is therefore 566 cars, as against 600 two weeks ago. Leith has shut down two days in the week, the entire product being more than the Joliet Steel Company wants just now. The outside producers are almost all short on orders. Moyer and Fort Hill are running four days in the week; Clarissa, Jackson, and Nellie, five days; Mahoning is running full, but has not market for all its product. Prices remain at \$1.20 a ton, and cars are in abundance. Labor continues in full supply and wages remain the same. The movement to organize the labor of the coke region by a recent mass-meeting at Scottdale was a failure.

**GAS AND PETROLEUM NOTES.**

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

	1885.	1884.
	Gallons.	Gallons.
From Boston .....	4,862,655	2,680,588
Philadelphia .....	71,284,702	37,589,714
Baltimore .....	5,431,106	6,299,857
New York .....	189,417,051	192,715,647
Total exports.....	270,995,514	239,285,801

**OHIO.**

A strong vein of gas was struck at Madison after drilling 780 feet below the surface.

**PENNSYLVANIA.**

The La Belle Steel-Works, of Alleghany, which are now closed for repairs, will use natural gas instead of coal when operations are resumed.

A strong vein of gas has been struck at the Schertz well, at Belle Vernon, at a depth of 2000 feet.

The Chambers Gas Company has at present four producing wells, with two others nearly down to the gas vein. The company intends to keep boring until it has ten good flowing wells to supply its customers.

Charters have been issued to the Manufacturers' Natural Gas Company of Pittsburg; capital, \$30,000; Canonsburg Light and Fuel Company, of Washington County; capital, \$20,000.

Another gas well has been struck at Murraysville by the National Tube-Works Company, of McKeesport.

Conferences were held in Pittsburg last week between the representatives of the Penn Fuel Company and the Philadelphia or Westinghouse Company. The former company was endeavoring to obtain a right to use the various safety appliances controlled by the latter company.

The Penn Fuel Company has announced that it will hold a meeting on August 28th, when it will bring up the question of increasing the stock and indebtedness of the company. According to the Pittsburg Telegraph, a large sum is needed to put the pipes of the company into good working condition.

The Hite Natural Gas Company is making rapid progress in laying its pipes. Sharpsburg will be reached probably within a week. The paid-up capital of the company is now \$250,000. The estimated cost of the line is between \$300,000 and \$400,000.

The Penn Fuel Company of Pittsburg, Pa., has awarded a contract for 8000 tons of cast-iron pipe to the Cincinnati and Covington Pipe Company of Cincinnati, Ohio. The pipe is to be 8, 10, 16, 24, and 36 inches in diameter, and the company has the privilege of doubling the order should a greater quantity of pipe be required.

Prospectors from Wolf Run, in Forest County, say that petroleum has been found in considerable quantities. It is believed among oil men that the discovery is an important and valuable one. There is a stir in regard to the oil strike at Raughts, in Elk County. The old well at that place upon being cleared out and torpedoed, produced a quantity of oil.

**GENERAL MINING NEWS.**

**ARIZONA.**

**GRAHAM COUNTY.**

On the morning of the 30th ult., the workings in the upper level of the Yankee mine began to give way. The ground on the Yankee and on part of the adjoining Longfellow mine cracked for a distance of several hundred feet, says the Clifton Clarion. An examination made both of the Yankee and Longfellow mines showed that the Yankee shaft was so damaged as to be useless for further service. The damage on the Longfellow mine is, so far as is known, confined to the old workings, which adjoin the Yankee. The upper and main adits of the Longfellow have been examined. They are but slightly damaged, and it is thought that the damage is confined to the upper levels.

**PIMA COUNTY—QUIJOTA DISTRICT.**

The secretary of the Peer, Peerless, and Crocker mining companies, under date of June 27th, reports that very little progress is made on the mill, owing to the delay of freight. Machinery at the wells is nearly all in place. The putting in of pumps will soon begin, and it is thought that in two weeks the water will be thrown to the mill.

**PINAL COUNTY.**

CALEDONIA.—Developments are pushed vigorously at this copper mine, which is situated eighteen miles from Picacho station, on the Southern Pacific Railroad. The property, which was recently sold to Chicago capitalists for \$40,000, is under the management of Mr. J. W. Haskin. The company has on its dumps twelve hundred tons of high-grade carbonates. A thirty-ton water-jacket furnace, which will work up to forty-five tons, has been contracted for at San Francisco.

**ARKANSAS.**

BEAR MOUNTAIN.—Advices from the mine are encouraging, and the first trial run has been made with the smelter.

**CALIFORNIA.**

**MONO COUNTY—BODIE DISTRICT.**

The bullion shipments for the six months ended June 30th amounted to \$206,652.97. Of this amount, the Standard shipped \$96,323.94; the Syndicate, \$62,327.42; the Bodie, \$17,966.61; and the remainder was made from Wagner's tailings mill, the New Standard, and other sources.

Reports for the week ended July 6th:

BODIE.—The pump has been repaired and work resumed on the 700 (Lent shaft) level. Twenty-six men are employed.

BULWER.—A cross-cut has been started east of the 200-foot level, and directly opposite the west cross-cut, which is now in what appears to be vein-filling, and looks very favorable, showing considerable quartz that gives fair assays. The south drift on the Homestake ledge has intersected the west branch of the ledge, on which there is an old drift. The vein is 18 inches wide. The men will now cross-cut east for the Ralston ledge, and then uprise.

CONSOLIDATED PACIFIC.—Preparations are making to begin the development of the veins cut in the tunnel. Most of the week has been consumed in laying track, putting in turn-tables, etc., and in cutting out the station for the winze. Owing partly to the more favorable character of the ground, the men will begin to cut out the station on the first vein cut in tunnel west of No. 3, and on this the first winze will be sunk. Every thing looks favorable.

STANDARD.—The ore-bodies look well. Ore shipped to the mill, 430 tons.

**SAN DIEGO COUNTY.**

HUBBARD.—The company has leased its dumps, and was to begin work in the mine at the beginning of this month.

READY RELIEF.—The mine is working steadily, and gives the owners good returns.

STONEWALL.—The weekly production amounts to about \$1500. A large body of ore was recently struck. The ore averages about \$20 a ton.

**CANADA.**

**PROVINCE OF NEW BRUNSWICK.**

The freestone quarry and plant at Rockland will be sold at public auction on the premises on the 29th of July. This quarry produces a light, olive-colored sandstone, is well developed, and has good facilities for shipping, the distance from quarry to wharf being about one mile, all on a down grade. Large quantities of this stone have been used in the construction of first-class buildings in Boston, New York, and Philadelphia; also in St. John, N. B., where it has been used for the new custom-house, post-office, Maritime Bank, and many other buildings. The plant, tools, and machinery will be sold in lots to suit purchasers, and the inventory may be seen and full information obtained on application to Mr. T. M. Mackelive, at Rockland, N. B., or to the liquidator, Mr. John Fair, Jr., No. 13 Hospital street, Montreal.

**COLORADO.**

**CHAFFEE COUNTY.**

MURPHY.—A large force is at work opening up new ground in the mine. The average width of the ore-body is over seven feet, and thus far in all the workings it is continuous. The average net value of the ore extracted, after paying all expenses of mining, transportation, and smelting, is from eight to ten dollars a ton. The present output is fifty tons daily. It is a noticeable feature of the present development that, the deeper the ore-body is penetrated, the larger the percentage of gold found.

**CLEAR CREEK COUNTY.**

The Georgetown Public Ore market bought in June 329 tons of ore, valued at \$38,600.

The Miners' Sampling-Works handled 175 tons of ore in the month of June; average value, \$102 a ton. Total value, \$17,725.

**CUSTER COUNTY.**

BASSICK.—The real estate of the Bassick Company was sold at Silver Cliff, on the 11th inst., to Mr. Clapp Spooner, of Bridgeport, Conn., for \$37,600, to satisfy the lien claims of the miners. The transfer includes the main lode and adjacent mines, mills, and other improvements and machinery. Another sale of the personal property of the mine was to take place on the 13th inst. under judgment.

**DOLORES COUNTY.**

GRAND VIEW.—The smelter is making every preparation for an early and continuous run. The company has just completed a very important purchase—\$20,000 worth of mineral from the Sheridan mine in Marshall Basin, and other ore from the same locality.

PASADENA.—The smelter is receiving more ore than its present capacity can handle, and the arrangements for increasing it are progressing. The water-jacket and most of the appliances are on the premises.

**GILPIN COUNTY.**

GARDEN.—The company has decided to ship the 250 tons of concentrating ore now on hand at the mine. The vein matter is improving as developments are

extended. The product of the mine so far has been from ore taken out in development-work.

**REPUBLIC MINING AND MILLING COMPANY.**—Work is to be resumed on the Pewabic and Iron mines in Russell District. The natural presumption is, that the 25-stamp mill of the company will also be started up as soon as the miners get out sufficient ore to keep it running.

#### GUNNISON COUNTY.

**ORPHAN BOY.**—This milling and reduction company is getting out quantities of ore from the Silver Falls claim on Lost Falls Creek that will pay for treatment close at hand.

**SYLVANITE.**—The company is adding chlorination-works to its plant, and will put the works in first-class shape. A Bruckner roaster has been purchased.

#### HINSDALE COUNTY.

**CROOKE MINING AND SMELTING COMPANY, LIMITED.**—Negotiations are pending, it is stated, that promise soon to result in the settlement of existing difficulties, the payment of the debts, and the starting up of operations.

#### LAKE COUNTY.

The Leadville *Herald* reports the following: Mr. Charles Francis Adams, the President of the Union Pacific Railroad, held a conference at Leadville on the 10th inst. with the managers of the various Leadville smelters, in regard to a reduction in freight rates. Nothing definite was settled upon.

Mr. J. B. Henslee, the leading iron ore buyer of the district, reports the demand for iron ore from argentiferous lead smelting-works, for fluxing purposes, quite good. The supply, however, is more limited than it has been for some time past, especially of good iron ore containing considerable quantities of silver. It is true that there is an almost inexhaustible supply of iron carrying from three to seven ounces in silver to the ton, but this class of mineral will not bear transportation to Denver or Salt Lake City, at existing rates. It is evident, said Mr. Henslee, that the foreign smelters will soon be forced to advance their prices for iron, as they will be forced to purchase the lower grades of iron ore, and to secure them, they must give enough to leave the miner something after paying freight.

Formerly all iron ore was purchased on a basis of treatment charges; that is, the smelters paid the market value of the silver contents of the ore, and a specified amount per unit of iron in excess of the silica contained. At present, considerable iron ore is purchased by foreign smelters in this district through Mr. Henslee, who pays the freight and 45 cents an ounce for the silver contents, provided the ore carries forty per cent excess in iron, and the ore runs more than from seven to ten ounces in silver to the ton.

The production of ferruginous silver-bearing ore in this district is exceedingly variable. At times, a score of mines is prepared to produce any desired quantity of this ore, and again scarcely a mine can be found prepared to supply an order for iron ore containing more than from four to six ounces of silver.

At present, Leadville is supplying the bulk of the iron ore consumed by the Salt Lake smelters, also much of the ore used by the Pueblo, Denver, and Durango smelters. The Kansas City Smelting and Refining Company has also used some iron from Leadville, and Manager August R. Meyer, of that establishment, will, if suitable rates can be secured, abandon the use of Missouri iron, which is barren of silver, and substitute the argentiferous iron ore produced by the Leadville mines.

**AGASSIZ.**—Most of the machinery for the concentrating mill at the Wolfe Tone has arrived and is going into place, which will take about three weeks. The machinery consists of nine Triumph belts, three centrifugal pulverizers, and an equal number of rock-breakers. The plant was purchased by the company under a written guarantee that it would do the work represented by the agent of the Triumph concentrators, Mr. Robert Corey.

**ANTIOCH.**—Pumping machinery has been placed on the mine. The mill has been running for some time on accumulated ore, which was extracted during the winter months when it was impossible to transport the product of the mine to the mill. The milling of the quartz from the Antioch has so far averaged about ten dollars a ton. The quantity of this kind of ore in the Antioch mine is almost unlimited, and if a suitable mill were erected on the premises, it could be mined and milled at a large profit.

**DENVER CITY.**—During June, there were shipped about 600 tons of iron ore, and sixty tons of silver and

lead ore. One of the winzes in the northern workings shows a pocket of very fine ore.

**EVENING STAR.**—The output for June was forty tons of lead ore and 1008 tons of iron ore, making a total of 1048 tons. The iron ore is secured from the large body between winze No. 2 and the upper shaft. The body is holding out well, and will in all probability extend to the upper shaft, if not beyond it, as similar iron has been disclosed in the extreme eastern end of the mine. The iron ore is hoisted through the main shaft; but it is contemplated soon to change this method of working, and lift the ore through the upper or eastern shaft.

**FRYER HILL.**—The Virginus lode of this company, adjoining the Dunkin and Climax mines, has recently been let. The lessees have started up work and propose to sink the shaft on the property one hundred feet deeper.

**IRON HILL CONSOLIDATION.**—The American Mining and Smelting Company is still pushing work from the White Cap shaft on this property, and shipping ore with considerable regularity. Arrangements for working the northeastern end of the Imes lode through neighboring shafts have not yet been completed. The Forfeit shaft is worked under a sub-lease. The company has begun shipping ore, having recently opened a good streak of ore, and erected a hoisting plant. The Little Missouri is worked under a sub-lease, the parties finding entrance to the lode through the No. 1 shaft on the A. Y. mine. Ore-skippings of limited extent have been made from this lease for some time past.

**IRON SILVER.**—Nearly all the old leases on the properties of this company that expired July first have been renewed.

**LEADVILLE CONSOLIDATED.**—The mines produced fairly well during June. Work has been started from the new shaft, at 90 feet from the surface, where a fine streak of chloride ore cuts through the shaft and gives evidence of extending some distance into the hill.

**LEE BASIN.**—The Wright shaft has been freed from the water, and the south levels, which have been flooded for a long time, are now cleaning up and partially retimbering. The main south drift will be advanced at once about 150 feet, in order to effect a connection with the Denver City workings. At the same time, winzes will also be sunk to explore the large bodies of iron ore underlying the workings.

**LITTLE CHIEF.**—The lessees on this mine produced and shipped to the Harrison smelter, during the month of June, 150 tons of ore, from the profits of which there were transmitted to the New York office \$1000. The most productive lease on the mine is the one covering the north end, where occasional fine streaks of galena are encountered in the large body of iron ore there. The lease, including Nos. 3 and 4 shafts, yielded some 100-ounce ore, secured from a block of solid ground to the south of No. 4 shaft. The lessees working on the southern end of the claim did fairly, but are producing very little now, owing to the prospect-work in progress in barren ground.

**LITTLE SLIVER.**—The work of sinking a new shaft on this property is making excellent progress, the shaft having already attained a depth of about 80 feet.

**MORNING STAR.**—During June, the mine produced more ore than for some months past. The ore sales were, as follows: Lead ore, 602 tons; concentrates, 106 tons; iron ore, 745 tons; total, 1453 tons. The concentrates averaged over 40 per cent in lead. The concentrating mill is working with good results, and its capacity is to be considerably increased soon. The product of the mine is sent to the Elgin smelter.

**QUARTETTE.**—A typical case, exhibiting the evil results of litigation and controversy, is afforded by a number of mines on Little Ella Hill, which have been consolidated within the past ten days. The properties are the Jessie Clark, Australian, Virginus, and Winnie, which encroach upon one another's territory, and present a series of conflicting interests that it would be almost impossible to adjust by any court. After fighting for their respective eighthths for years, the proprietors of the properties finally concluded to settle their disputes without the intervention of the court, and recently agreed upon a basis of settlement. The Quartette Company was formed with a capital stock of \$1,000,000, divided into 100,000 shares, which will be distributed among the late owners of the mines consolidated in proportion to the appraised value of their interests in the various lodes. The property embraces about twenty acres.

**SILVER CORD.**—The output of the mine during June

was over 1700 tons, and it is expected it will be about the same this month. The mine is now looking much better than it was for a year past, and while the ore is of low grade, the prospectively large resources are indicative of profitable operations in the future. The mine is worked very economically.

**SMALL HOPES.**—The Small Hopes mine shipped something over 2000 tons of ore during the month of June, and transmitted to the New York office over \$80,000, and there are two lots of ore to be settled for

#### PITKIN COUNTY.

**DURANT VS. EMMA AND ASPEN.**—The injunction that was asked for by the Durant against the Emma and Aspen mines has been refused. Both sides are determined, and no expense is spared for surveys and experts. Party lines are more defined, and the feeling is growing bitterer every day. The District Court, at Leadville, was to try the case on the 13th inst.

#### SAN JUAN COUNTY.

**SAMPSON.**—The returns from the first clean-up for the month of June at the mill gave over \$4000. The length of the run was fourteen days. The returns for the latter portion of the month have not been received.

#### SUMMIT COUNTY.

**QUINCY & KOKOMO.**—Arrangements have been made for continuing the tunnel one hundred feet more, when it is hoped that the extension of the Queen of the West lode will be met. The tunnel is already in over 600 feet.

#### DAKOTA.

#### LAWRENCE COUNTY.

**BARR.**—These placer claims Nos. 3 and 4 have been leased by H. Alinton, and it is the intention to buy the Esmeralda water-right.

**BUXTON.**—Work has begun for a mill-site on this property, situated in Fantail Gulch.

**FATHER DE SMET.**—Official reports for the week ended July 6th show that 1975 tons of ore were extracted and milled. Fourth level, uprise advanced 9 feet on company account. Rise up 32 feet. The bullion production for the last half of June was \$17,706.67.

#### IDAHO.

At the regular monthly meeting of the Wood River Mining and Industrial Association at Hailey City, last week, the committee on freights reported progress in the matter of securing reduced rates on low-grade ores, and was given further time. This committee, having thoroughly examined into the question of the reduction and sale of low-grade ores, and compared the rates paid by the Philadelphia Company with those paid by the smelters of Salt Lake, Denver, Pueblo, Omaha, Kansas City, and California, reported that the Philadelphia Company was paying from \$5 to \$15 more a ton for low-grade ores than could be obtained from any other concern in the world. The home company is enabled to do this by the fact that it has less freight to pay on the bullion in the ores that come out of its furnaces than other smelters, which were compelled to ship ore in bulk, in its crude state, and pay freight on from 30 to 70 per cent of waste. The chairman was instructed to call a meeting for the first of next October, or at any time prior to that date when he may deem it necessary or desirable.

#### MEXICO.

The Mexican *Financier* reports the following:

A copper and iron mine of good promise has been discovered at Tepetongo, State of Hidalgo.

Mining in the district of Ocotlan, State of Oaxaca, is reported to be in a far from flourishing condition. Lack of capital prevents the proper working of several good mines, such as the Taviche. Several mines, the El Chivo, La Trinidad, the Union, and the Renacimiento, are regularly worked, but with little capital.

Silver bars to the value of \$190,661 were shipped from Mazatlan in May.

A number of Mexican and Central American mines are placed in the London market. The latest is the Silver Queen United Company, Limited, the capital being £250,000 in £2 shares; purchase consideration being £200,000 in fully paid shares. The mines taken by the company are the Los Bronces, Animas, Nahuala, San Juan, and Canzicitas, situated in Sonora.

The larger part of the mines at ChencaMé in the State of Durango, which for some time were reported as abandoned, are again worked by Mexican and American companies. Good ore is taken out.

#### MICHIGAN.

#### GOLD MINES.

**ROPES.**—A circular has been issued stating that the recent 10-cent assessment has been levied for the pur-

pose of increasing the capacity of the mill by adding two Wiswell machines, making the daily output 35 tons. To get the mine into the present condition has taken both a large part of the surplus and all the money earned besides. The results for February, March, and April are quite low, owing to the poor quality of most of the rock in the second level at that time, and also to the fact that the shaft was so started that it must be sunk in the foot of the main body of quartz, and consequently in very low-grade ore. The expense of operating the mine since December amounts to something over \$2500 a month. The expense of operating with 35 tons output a day can hardly exceed \$3000 a month.

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, July 8th:

	Gross tons.
Marquette	208,759
Pig-iron	1,205
L'Anse	14,099
St. Ignace	29,288
Pig-iron	1,178
Escanaba, Marquette District	190,386
Menominee District	264,630

The shipments by lake from all ports of the district up to date amount to 707,162 gross tons, against 1,015,776 tons at the corresponding date last year, the falling off for this season being 308,614 tons.

MISSOURI.

The Age of Steel publishes the following table showing the receipts at St. Louis of coal and coke, iron and fine ores and metal manufactures, for the first half of 1885 and 1884:

	Half-year. 1885.	Half-year. 1884.
Coal, tons	869,378	937,307
Coke, tons	21,702	47,522
Iron ore, tons	59,339	117,775
Zinc ore, tons	8,233	10,406
Pig-iron, tons	41,657	46,778
Nails, kegs	434,338	362,649
Lead, pigs	570,053	535,538
Tin plates, boxes	66,415	64,180

CENTRAL CONTINENTAL GOLD AND SILVER MINING COMPANY.—Licenses to incorporate have been issued by the Secretary of the State of Illinois to this company, of East St. Louis, to do a general mining business for gold, silver, etc., and to reduce the same by smelting; capital stock, \$2,000,000; incorporators, J. V. Phillips, Stephen E. Barron, and H. G. Gonzalez.

MONTANA.

Mr. S. T. Hauser, of Helena, who is interested in several mining enterprises, has been appointed Governor of the territory.

JEFFERSON COUNTY.

The Northern Pacific Railroad Company has made the following reduction of rates on the Wickes branch, going into effect July 1st:

	New rate.	Old rate.
Helena to Wickes	\$1.75	\$2.35
" " Corbin	1.55	2.10
" " Jefferson	1.45	1.90
" " Clancy	1.00	1.30

BONANZA CHIEF.—This mill, at Montana City, will start up on ore from the Overland mine. The mine and mill belong to S. T. Hauser and A. M. Esler.

SILVER BOW COUNTY.

MOULTON.—At the annual meeting of the board of directors, held at Butte recently, the following officers were elected: President, William A. Clark; Vice-President, Eh H. Murray; Treasurer, James Ross Clark; Secretary, Alexander J. Johnston; Assistant-Secretary, John M. Moore.

NEVADA.

DOUGLAS COUNTY.

WELLINGTON GOLD MINING COMPANY.—This company is offering for sale a portion of the shares of the company (free from all assessments) sufficient for the purpose of building a mill, etc., etc., to work the body of free gold milling ore already opened up and ready for extraction. Interest on proposed subscriptions guaranteed by Wells, Fargo & Co. for two years, payable in New York quarterly at six per cent a year. It is stated that a part of the amount required has already been subscribed for. The Wellington Apex mines are situated near the boundary line of Esmeralda County, and near the eastern boundary line of California, and about fifty miles from Carson City. The Virginia & Truckee Railroad, which connects with the Central Pacific at Reno and passes through Carson City, affords the nearest railroad facilities. The company's office is at No. 39 Broadway, Room 23, this city.

ELKO COUNTY.

GRAND PRIZE.—The company has begun the milling of ore, and the total bullion shipment for the past two weeks amounts to about \$15,000.

EUREKA COUNTY.

EUREKA CONSOLIDATED.—During the week ended July 5th, there were hoisted 425 cars of ore from tributaries. The Williams pitch does not look quite so well in the bottom. Burnett's, Stevens's, and McDonald's pitches have shown a change for the better during the week. Every thing is in good working order about the mine. During the week, the furnace has produced 830 bars of bullion, weighing 44 tons, of an average of \$326 a ton. Mann is getting ready for the experiment of roasting 500 tons of speiss (a character of ore laid aside from the workings of previous years, which heretofore could not be profitably worked). If this proves a success, it will add greatly to the value of the property.

LINCOLN COUNTY.

RAYMOND & ELY.—The waste-dump has been disposed of to the company at Bullionville, and will be overhauled for the purpose of leaching.

STOREY COUNTY—COMSTOCK LODGE.

The pay-rolls of the leading mines for the month of June aggregate about \$175,000.

CHOLLAR.—The extraction of ore from the Chollar croppings has been resumed. No ore has been shipped as yet, on account of there being no idle water-power mills available for crushing it. The only mill unemployed at present is the old California steam mill of 80 stamps; but the ore is said to be too low in grade to admit of being worked in a mill where steam is used as the motive power. That now taken out from the upper levels is run into the Chollar ore-dump.

CONSOLIDATED CALIFORNIA & VIRGINIA.—There were extracted 878 tons of ore and shipped to the Morgan mill 899 tons and 530 pounds during the week ended July 4th. The average assay value of the ore milled, as by samples from the batteries, was \$27.98 a ton. Hoisted 12 tons of waste. Ore extracted under the Jones contract, 380 tons, and shipped to the Eureka mill under that contract, 447 tons and 1290 pounds. The average assay value of the ore milled, as by sample taken from the battery, was \$19.67 a ton.

EMPIRE STATE MILL.—This mill in Six-Mile Cañon has been shut down on account of the scarcity of water in the creek. This shutting down will cause the Monte Cristo mine to close down until it can make some arrangements for more water, as the ore is of too low a grade to be worked at a profit in steam mills.

HALE & NORCROSS.—The first bar of bullion, valued at \$2712, was produced on the 2d inst. It is stated to be the product of the first crushing of ore from the 3000 level. The openings on the 3000 level are said to be looking well. The bottom of the winze sinking from the station in west cross-cut No. 2 is down 32 feet below the floor. The north drift along the vein is still cutting through mineralized quartz. Work is pushed vigorously in all the openings on the 3000 level. The combination shaft will be sunk 200 feet below the 3000 level. Work has begun.

MARIPOSA MILL.—This tailings mill in Seven-Mile Cañon has been shut down, they having worked up the last of the large bank of tailings that was flumed to the present mill-site in bonanza days. The mill will be taken down and removed to Empire for the purpose of working the tailings resulting from the Consolidated California & Virginia ore now crushing there.

SIERRA NEVADA.—The face of the north lateral drift on the 520 level presents a more favorable formation, being of a more mineralized character than heretofore.

WINFIELD MILL.—Extensive repairs are making to this mill in Seven-Mile Canon, and five more stamps will be added. When this is done, the mill will be started on ore taken from the Curry cropping by the Water Company. About 100 tons of this ore are on the dump at the mill.

YELLOW JACKET.—A drift is running on the 1700 level, to intersect at that depth the continuation of the vein, which has been and is still yielding such large quantities of ore from the upper levels. The daily yield is about 150 tons, which is taken out between the 1100 level and the surface.

NEW HAMPSHIRE.

MILAN.—Official advices state that this company, of which Mr. F. L. Bartlett, of Portland, Maine, is superintendent, has now been running some three years, and

has reached for the past eighteen months a daily output of 100 tons. The ore consists largely of pyrites, about one half of the entire output being shipped for making sulphuric acid. Copper predominates in the remainder, and this is smelted for copper and the smaller percentages of gold and silver. Several lodes are worked, and the supply is large. The company has purchased all the machinery, coal, and ores belonging to the Portland Smelting and Reduction Company, and has leased the buildings, lands, and wharves for a term of ten years beginning July 1st. The Milan Company will move its smelting-works, now running at Milan, down to Portland, and hereafter all its smelting will be carried on at Portland. Work has already begun, and by August 1st, the works will have a capacity of 100 tons daily, which is the usual output of the mine. Two of Mr. Bartlett's water-jacket furnaces are used for matting. The most modern processes will be used for treating the ores for copper, gold, silver, and zinc. The company's office is at No. 55 Kilby street, Boston.

NEW MEXICO.

The Silver City Sentinel is authorized by Mr. M. G. Hardee to state that he will give five or more acres, in a good location in the upper part of town, to any person or company that will build on it sampling-works and ore-buyer, mill or any other works for the treatment of ores. Water can be had in twenty feet, and the railroad runs right through that part of town. This is a good opportunity for any one seeking an opening, and is worth looking into.

BULLARD'S PEAK.—The company is opening up its property at Silverdale. In addition to the present workings, it has begun drifting 200 feet each way, east and west, on the vein at the bottom of the 115-foot shaft; at the 65-foot level, it is drifting west, thus getting a good body of ore ready for stoping. The vein is about 18 inches wide. The company has made arrangements to ship its ore to the Flagler Reduction-Works for treatment, as soon as the latter gets running.

FLAGLER REDUCTION-WORKS.—A large gang busy getting the roaster and crushing machinery into place at the works in Silver City.

SILVER CITY CONCENTRATING AND SMELTING-WORKS.—G. A. Shufeldt has taken charge of these works, which were put up about one year ago, but, from one cause or another, have never been started. Ores in quantities from a burro-load upward will either be bought or sampled.

NORTH CAROLINA.

MECKLENBURG COUNTY.

CRUMP.—All the buildings and machinery of this gold mine, near Charlotte, were burned on the 11th inst. The fire caught in the engine-room. The loss is \$15,000; no insurance. The Crump was owned by Boston capitalists. S. H. Tarbell was the general manager. The buildings and machinery were new, and the mine had just begun work on the 7th.

PENNSYLVANIA.

The discovery of mica at South Mountain, near Reading, is reported. Some ten years ago, the mineral was found there in small quantities, but the expense in mining was so great that the work was abandoned. Several months ago, several parties decided to lease a tract of land and continue the exploration. A shaft was sunk on the property of Joseph Texter, and after going down some twenty-five feet, pockets of mica were found. The mineral lies imbedded in quartz, feldspar, and kaolin. It is silvery white in color. Arrangements are making to sink the shaft deeper.

TEXAS.

GRAYSON COUNTY.

It is reported that a deposit of manganese has been discovered at a point about ten miles east of Denison City. Two veins have thus far been uncovered. A company will be formed to work the property.

UTAH.

SALT LAKE COUNTY.

FLAGSTAFF.—The statutory meeting of this company, recently held in London, passed off satisfactorily. Professor Vincent, to whom the success of the reconstruction scheme is mainly due, presided, and stated that 124,000 shares have been taken up, leaving the company with a working capital of £18,000. The adjoining mines are doing very well, and it is now proposed to sink the Flagstaff shaft 100 feet deeper,

so as to reach the same rich zone of ore. The company starts work with every prospect of success.

TOOELE COUNTY.

KATHARINA.—A strike is reported. A six-ton shipment of first-class ore went over 90 ounces. The lessees have secured several properties adjoining the Katharina, which they have under lease from an Eastern company.

MARKETS.

NEW YORK, Friday Evening, July 17.

Silver.

Table with columns: DATE, London, N. Y., DATE, London, N. Y. Rows for July 11, 13, 14 and July 15, 16, 17.

The price of silver in London having declined a little the past week under lower bank rates in India, our market has been weaker from this cause, as well as in consequence of lower sterling exchange.

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.

Change in the Manner of Buying Silver.—A change has been made by the Treasury Department in the manner of purchasing silver for coinage into standard dollars.

Copper.—Nothing of special interest has transpired in the market since our last report. Very little is doing, and prices remain firm.

Mr. William Keyser has purchased the Baltimore Copper-Works and the assets of Messrs. Pope, Cole & Co., from the assignee, and, in connection with Messrs. Robert Garrett & Sons and Mr. John S. Gilman, President of the Second National Bank, will conduct the business in his own name.

Tin.—There has been a very strong market for spot tin, and prices kept up by dealers, 23 cents having been refused early this week; but since then, owing to a slight break in London, caused by political uneasiness, holders here have moderated their views, and we close to-day nominal at 22 1/2c.

Futures fairly dealt in at from 21 1/2c to 20.90c. August; 21 1/2c to 20.75c September delivery.

Spot tin has fluctuated in London as follows: £95 on the 11th; £96 on the 13th; £96 15s. on the 14th and 15th; £95 10s. on the 16th and 17th.

Import of Tin into the United States during the First 11 Months of the Fiscal Year.

Table comparing 1885 and 1884 Pounds for Less export and Net import.

Lead.—The market is very firm and there is a fair demand, though consumers are not disposed to lay in future stock. Some 700 tons were sold at 4.05c to 4.10c.

£12 10s. Lead pipe has gone still higher, and is quoted at 5 1/2c. Sheet-lead at 6 1/2c.

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

Market just a little stiffer, and the squeeze still goes on. Prices continue to take a higher level gradually. Refined is wanted at 3.97 1/2c., but held at 4c.

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

There has been considerably more inquiry for both hard and soft lead, in consequence of which sellers have been asking a little more; but only a moderate amount of business has been transacted.

Spelter.—Very little of this metal is offered, and every body seems to have withdrawn from the market. Some small retail sales have been made.

Antimony.—The London quotations of Hallett's to-day remain at £37, the same as last week. There has been a slight business in Hallett's at 9c., and Cookson's at 9 1/2c.

Nickel.—In small lots, we quote at 70@72c. for Domestic (Wharton's) or Foreign.

Bismuth.—Worth from \$2@2.25 a pound.

Aluminium.—\$8@\$9 per pound; 10 per cent Aluminium Bronze Ingots, \$1 per pound; Aluminium Silver, 75c. an ounce.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 17.

American Pig.—The situation remains the same, and business has been quiet. We quote No. 1 X, \$17.50@18.50; No. 2 X Foundry, \$16@16.50; Gray Forge, \$15@15.25.

Scotch Pig.—Only small sales are made to satisfy the immediate demand. We quote: Coltness, f. o. b. Glasgow, 48s. 3d.; Langloan, f. o. b. Glasgow, 47s. 6d.; Summerlee, f. o. b. Glasgow, 46s. 6d.; Gartsherrie, f. o. b. Glasgow, 46s. 6d.; Glengarnock, f. o. b. Glasgow, 46s.; Dalmlington, f. o. b. Glasgow, 43s.; Eglinton, f. o. b. Glasgow, 40s. 9d.

Rolled Iron.—We continue to quote American Beams, 3c.; Foreign Beams, 2 1/2@2 3/4c.; Angles, 1.9@2c.; and Tees, 2@2 1/4c.

Bar Iron.—There is but a small demand for delivery here; we quote 1.45@1.55c. for Common and 1.7@1.9c. for Refined for round lots. Store prices are about 1/4c. higher.

The price of Swedish Iron is quoted at \$70.

Plates.—Tank Iron, 2c.; Refined, 2 1/2@2 3/4c.; Flange, 3 1/4@3 1/2c.; Steel Plates, Ship, 3c.; Tank, 2 3/4 Boiler, 3c.

Old Rails.—Sales of a few hundred tons are reported at \$16.

Steel Rails.—The event in this market has been the sale of about 10,000 tons at about \$36, to be delivered at San Antonio, Texas. The contract went to an Eastern mill. Steel rails are offered at mill at \$27.

Philadelphia. July 16.

[From our Special Correspondent.]

Receipts of ore continue of moderate dimensions, and are made chiefly for two large consumers who depend more or less on foreign sources of supply.

Pig-Iron.—But little Southern pig-iron is arriving. During the week, contracts have been placed for a few hundred tons, which will be delivered at \$14.25 and \$17 respectively. Lehigh irons are held firmly for the better brands; no sales beyond absolute requirements have been made.

Bessemer.—Bessemer is of slow sale, and is quoted according to quality at \$18@19.50.

Muck-Bars.—Quotations, \$26@27.50; sales moderate.

Manufactured Iron.—From the encouraging reports

received from throughout the State, a good deal of business has been transacted during the past ten or twelve days, evidently the business that was withheld until after the opening of the half-year. Our mills have just now, throughout Eastern Pennsylvania, a fair showing for business. Medium is 1.50@1.60c.; Refined, 1.65@1.80c. Stores are doing more business.

Wrought-Iron Pipe.—Two orders for August and September delivery were placed this week, at a shading from card rates.

Sheet-Iron.—The demand now runs mostly for galvanized for building purposes, in small orders. Some makers are not taking orders, as there is no margin.

Plate and Tank.—Plate is 1.90@2.10c.; Shell, 2.30@2.50c.; Flange, 3 1/4@3 1/2c. The manufacturers are not able to report large orders.

Structural Irons.—The mills have since July 1st secured orders for eight or nine hundred tons, and a good deal of business is in sight. Angles are 2c.; Tees, 2.40c.; Beams and Channels, 3c.

Steel Rails.—The inquiries on the market to-day are for upward of twenty thousand tons. Quotations are \$27 nominally.

Old Rails.—Inquiries are for small lots. Offers from buyers are in hand at \$16.75@17. Makers ask \$17.50@18.

Scrap.—The resumption of work at several mills has improved the demand for Refined Scrap, which is going at \$18@19.

Pittsburg.

Dispatches to the Metal Exchange to-day state that there is a slightly improved demand; the sales show an increase over the previous week, while values are about the same. The following are the sales for the week:

Table listing sales for various iron products like Gray Forge, Lake ore, native, etc., with prices per ton.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 17.

Statistics.

Production Anthracite Coal for week ended July 11th, and year from January 1st:

Table comparing production of anthracite coal in 1885 and 1884, broken down by company and region.

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.....11,107,215; 1882.....13,901,634; 1881.....13,063,325; 1883.....14,712,252.

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 June 30th and year from January 1st. Tons of 2000 pounds:

Table showing coal production by kind (Cannel, Gas, Splint and block, New River, etc.) for 1885 and 1884.

Production of Coke on line of Pennsylvania RR. for week ended July 11th, and year from January 1st: Tons of 2000 pounds.

Table showing coke production by region (Alleghany, West Penn., Southwest Penn., Penn. & W. Region, Monongahela, Pittsburgh Region, Snow Shoe) for 1885 and 1884.

\* Reports for week ended July 11th, 1884, were not published, and hence we can not give the exact figures of decrease.

**Production Bituminous Coal** for week ended July 11th, and year from January 1st: Tons of 2000 pounds, unless otherwise designated.

	1885.		1884.	
	Week.	Year.	Week.	Year.
Philadelphia & Erie RR.....	73	16,748	.....	.....
*Cumberland Region, Md.....	55,342	1,370,142	60,543	1,401,725
*Barclay Region, Pa.....	2,967	126,882	3,315	170,294
*Broad Top Region, Pa.....	.....	.....	.....	.....
Huntington & Broad Top R.R.....	1,858	86,872	3,649	100,538
East Broad Top, Clearfield Region, Pa.....	.....	.....	.....	.....
Snow Shoe.....	1,729	82,795	2,820	97,166
Karhaus (Keating).....	1,973	69,729	920	15,271
Tyrone & Clearfield.....	55,800	1,584,043	56,472	1,616,531
Allegheny Region, Pa.....	.....	.....	.....	.....
Gallitzin & Mountaintain.....	9,657	263,724	7,184	201,206
<b>Total.....</b>	<b>129,399</b>	<b>3,600,835</b>	<b>134,903</b>	<b>3,602,731</b>

\*Tons of 2240 lbs.

**WESTERN SHIPMENTS.†**

Pittsburg Region, Pa.....	.....	.....	.....	.....
West Penn RR.....	3,014	131,890	4,605	151,419
Southwest Penn RR.....	3,115	55,167	937	77,718
Pennsylvania RR.....	4,344	104,402	5,178	149,957
Westmoreland Region, Pa.....	.....	.....	.....	.....
Pennsylvania RR.....	35,038	575,993	27,886	653,448
Monongahela Region, Pa.....	.....	.....	.....	.....
Pennsylvania RR.....	7,239	124,205	2,717	82,155
<b>Total.....</b>	<b>52,750</b>	<b>991,457</b>	<b>41,325</b>	<b>1,114,697</b>

Grand total..... 182,149 4,592,292 176,228 4,717,428  
 † Considerable gas-coal shipped East, of which no division is made in report.

**Anthracite.**

In past years, the dullest portion of the summer season was usually reached in the few days before and after the 4th of July. Some improvement was generally noticeable within a week after, and by the first of August a fair demand could generally be counted upon. Although the usual dullness prevailed this year about the Fourth, there is but little, if any, better demand at present, while prices are much more demoralized than they were at that time. In addition to this, stocks are accumulating continuously, and the best opinions in the trade do not look for a much better business in August.

The fact is, that the gentlemen who, early in the year, attempted, by artificial means, to regulate the coal trade, had not the power to regulate the general business of the country and the prosperity of its people, hence there is not the demand necessary to permit them to carry out the plans as arranged. The coal trade is in a very critical position owing to overproduction. The market will not take any thing like 6,050,000 tons in July and August, and unless a marked curtailment of production be agreed upon and enforced, such restraining influences as still live with the combination will be crushed, and the scenes of 1876 to 1879 will be re-enacted. To save the market, the presidents should come together immediately, and announce a reduction of the allotment of quite 1,000,000 tons between now and September.

We are informed that the Delaware & Hudson Canal Company will not mine its full quota this month, and that it is making strenuous efforts to secure the co-operation of the other companies in bringing about a reduced output. It is stated that the Reading and Lackawanna companies object to this movement. The Reading is said to be particularly opposed to this action, because, from its stand-point, there does not appear to be any necessity for it. Furthermore, the necessities of this company are so great, owing to the continuous increase of its burdens during the past six months, that to stop now, when it had counted upon its harvest, would be very embarrassing indeed.

There is a cloud that has just risen above the horizon, that may be the first signs of a coming storm for the coal trade. Rumor has it that there are negotiations pending between the Pennsylvania Railroad and Mr. Vanderbilt for the purchase of the latter's interests in the State of Pennsylvania. What amount of truth there may be in this rumor it is hard to say, although ultimately something of the sort will probably be accomplished. As it is, Wall Street is betting millions of dollars that it is an accomplished fact, or will be soon. However, as the "lamb" appear to enjoy this bait very much, it is more than probable that it will be withdrawn and prepared for them over and over again, as long as they will bite at it, and, when it is least expected, the trade will be consummated. Whatever may be done, the Pennsylvania Railroad will become a greater power in the coal trade. No agreement can well be made that does not cover Mr.

Vanderbilt's interests in Reading. If the business of Reading is to be reduced, as is proposed by all plans mentioned, and all of its hopes of a further increase of business, by the building of the South Pennsylvania Railroad, are wiped out, Mr. Vanderbilt may as well give his interests in Reading to the Pennsylvania for all they will be worth. If the Pennsylvania Railroad acquires a control of Reading, it will then practically control the anthracite coal business. If it does not acquire such control, but reduces the business of the Reading, and removes the support of Mr. Vanderbilt, it will be impossible to prevent the Reading's coal properties from coming upon the market, in which event it will probably be found that the Pennsylvania will become the purchaser of a very large proportion of them, and with its new Schuylkill Valley line, will be able to entirely control the policy of the whole trade. It is not necessary to state that that policy has been, and is, opposed to combinations.

The Reading Company is selling Chestnut coal at about \$3.02 f. o. b. We hear of some Stove coal down to \$3.50, and Broken and Egg under \$3 a ton. Some say that Buckwheat is hardly paying freights.

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

	Selling prices.	Circular rates.
Broken and Egg.....	\$3.00@3.35	\$3.40@3.65
Stove.....	3.70@ 3.85	4.00@ 5.00
Chestnut.....	3.00@ 3.40	3.65@ 4.00
Pea.....	1.90@ 2.40	2.45@ 2.65

Buckwheat has sold as low as \$1.60.

**Bituminous.**

There is practically nothing doing in this class of coal on new orders. Prices are quite as low as they have been, and freights are very favorable to shippers. This branch of the trade is looking with much interest upon the negotiations between the Pennsylvania Railroad and Mr. Vanderbilt, hoping that it will result in the Pennsylvania securing control of the Beech Creek road and equalizing the advantages in freight rates.

**Buffalo.** July 16.

[From our Special Correspondent.]

"There is a good undertone and better feeling in the anthracite coal trade," was the answer made to my query; "the trade in the fall is bound to be good also; but I can not enter into details as to my reasons for arriving at this conclusion." The impressions here noted are those generally entertained by the trade. The bituminous coal trade is unchanged.

We are to have cheaper gas in the near future. The Consumers' Gas Company has been started with a capital of \$500,000. Considerable stock has been taken already. The price to be paid will not exceed \$1.25 per 1000 feet, and the illuminating power is to be far ahead of our present supply.

Mr. E. L. Hedstrom, the President of the Merchants' Exchange, has left our city for several months, to attend to his coal and iron trade in Chicago.

The Buffalo Coal Exchange is now working well; perfect harmony prevails, and living prices are obtained.

The bids for coal for the Poor Department were opened a few days since. Only the regular schedule prices were given, namely, \$4.60 for Stove and Chestnut, delivered in all parts of the city on orders from the poor-master.

The Delaware & Lackawanna Railroad Company will obtain possession of the Union Steamboat Company's property on Central Wharf in a few weeks, the award of the Commissioners having been confirmed by the courts.

The Lake Carriers' Association has been organized "to consider and take action upon all general questions relating to navigation and freights on the lakes, etc., with the intent to improve the character of the service rendered to the public, to protect the common interests of the carrier, and to promote the general welfare." Local committees are to be appointed. This move will, in the near future, affect coal freights. Some vessel-owners profess to believe that the railroads connecting here are at the bottom of the movement, and that it will prove very costly to the lake marine interests; hence they are unwilling to combine on any questions relative to freights, as the steamboat lines having connection with the railroads are prominent in the movement.

The Rochester & Pittsburg Railroad handled 72,065 tons of coal during June; same period last year, 52,677 tons; increase, 1885, 19,388 tons.

Lake freights last Thursday afternoon declined 5 cents to Chicago and Milwaukee, as I intimated in my letter; on Tuesday, another drop of 5 cents to Chicago was announced in consequence of scant supply of coal and plenty of vessels; yesterday, a further concession of still another 5 cents was asked to both ports, and obtained. Lake Superior and other points were not changed. The steamboat companies are laying up 14 propellers in consequence of low freights and meager shipments.

The shipments of coal by lake from Buffalo, July 9th to 15th, both days inclusive, were 48,400 tons; namely, 24,830 to Chicago, 11,230 to Milwaukee, 1820 to Toledo, 1300 to Detroit, 2900 to Green Bay, 400 to Marine City, 3400 to Duluth, 440 to Sandusky, 1300 to Marquette, 250 to Port Clinton, and 530 to Muskegon. The freight engagements were at the following rates: 60@55@50c. to Chicago, 55@50c. to Milwaukee, 40c. to Superior City and Duluth, 55c. to Green Bay, 25c. to Toledo, Port Clinton, and Detroit, 65c. to Muskegon; closing heavy and dull.

The shipments by canal for the week include 3 loads to Albany and Troy, at 85 cents net, captain to pay loading and unloading, and 3 loads to Syracuse, at 60 cents gross, captain to pay unloading only. The nominal rate to New York, \$1.05 net ton, captain to pay loading and unloading.

The receipts of coal at Duluth for the week ended July 11th, were 34,435 tons. The receipts of coal at Washburn, Lake Superior, during the month of June were 11,106 tons.

**Chicago.** July 15.

[Special Correspondence.]

A few signs favorable to the anthracite trade begin to show up, and a more hopeful feeling seems to have struck the shippers' agents. The trade has been much slower this season than in previous years; but July is half gone, and the country dealers now begin to "drop in just to see what the market is, you know." A few small orders have been placed at low prices; but the shippers begin to realize the fact that very soon they will have all the orders they can take care of, and therefore the low prices now quoted are for immediate shipment only. The freight agents of the several Western railroads had a protracted meeting in Milwaukee the 14th inst. principally to consider the coal rates from Lake Superior and Lake Michigan ports to competing ports. The rates have formerly been in favor of Lake Superior ports; but at the meeting on the 14th, the same rates were made for Lake Superior as for Lake Michigan shipping points, and the rates from Peoria were fixed at 22 cents a ton less than Chicago rates. To make the coal business more solid, they agreed to appoint a committee of three to be selected from hard coal men, one to represent Lake Superior ports, one for Lake Michigan ports, and a third to represent the rail interests centering in Peoria. Two of the committee were appointed—E. M. Saunders, of St. Paul, for Lake Superior, and George Merryweather, of Chicago, for Lake Michigan. The Peoria member has not been appointed. All questions of equity or dispute with reference to hard coal that may arise are to be referred to this committee, and their decision is to be binding until May 1st, 1886. The receipts of anthracite for the past week by vessel have been comparatively light. If the stocks are kept small, the price will soon be satisfactory. The bituminous trade is still greatly demoralized. Said large dealer in steam coal: "We are delivering steam coal at just 10 cents a ton above the actual cost of handling, and if there is a shortage or any allowance made, we lose money." The receipts of bituminous coal increased in June, 1885, 134,625 tons over the receipts of June, 1884.

**Boston.** July 15.

[From our Special Correspondent.]

The anthracite branch of the Boston coal market is rather less active than when I last wrote you. There is no change in the nominal f. o. b. quotations. The New York companies do not allow their agents here to sell below \$3.85 for Stove—at least, they do not sell below that figure openly. Outside coal is sold from \$3.65@3.75. It is not easy to state why broken coal is so firm. But the elevated railroad contract serves practically to keep the Lehigh broken out of the market, and individual operators are producing as little as they can of large sizes. There is not as firm a feeling in egg as in broken, though the former is held at net circular rates. Hard egg and chestnut form the bulk of stock that the Philadelphia & Reading has

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and amount per share of last. It lists various mining companies and their financial details.

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 as previously paid \$275,000 in eleven dividends, and the Terra \$75,000. ¶ Total number of shares, 530,000; 50,000 shares have never been issued, and are still held by the company.

NEW YORK MINING STOCKS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE (July 11-17), SALES, and similar columns for non-dividend-paying mines. Lists various mining companies like Alice, Amie, Argent, etc.

Dividend shares sold, 38,138. Non-dividend shares sold, 44,710.

on hand. It is short of desirable sizes, and is likely to remain so till September.

To the retailer's mind, the market is in a very comfortable position, and one not calculated to give him much anxiety. He has no fears that an advance can be established in the immediate future...

There is no special activity in bituminous, and if there were, it would be concealed as carefully as possible, as every thing is done on the still hunt principle. We learn that, where it was supposed the Providence Railroad had bought at least half a year's supply early in the season...

The South Boston Gas-Light Company has sold its stock to a water-gas company, said to be backed by the Standard Oil Company. Gas-coal is without movement at \$4.10@4.15, delivered.

Freights are weak and colliers plenty, quoting 80 cents at New York and \$1 at Philadelphia. Let us have a decline of 10 cents, and we shall again reach the bottom figures of the year.

New York, 80@85c.; Philadelphia, \$1@1.05; Baltimore, \$1.10@1.15; Newport News, \$1.10@1.15; Richmond, \$1.20; Cape Breton, \$1.50@1.75.

The retail movement is small. Consumers, like retailers themselves, seem to be in no hurry to place their orders. We quote:

Table listing prices for various goods: White ash, furnace and egg; Shamokin, egg; Lorberry, egg and stove; Franklin, egg and stove; Lehigh, furnace, egg, and stove; nut.

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

FINANCIAL.

NEW YORK, Friday Evening, July 17.

During the week under review, the mining market has been moderately active, and the dealings have been well distributed throughout the list. Prices have been firm.

The Comstocks appear to be the favorites, and the largest business has been done in these shares. Sutro Tunnel has again climbed the ladder, the transactions summing up 23,700 shares, at from 15@17c. Consolidated California & Virginia has revived, and ranged from \$1.60@1.80; sales of 5000 shares. Savage has declined from \$2.60@2.25. Sierra Nevada has been higher at from \$1@1.30. Best & Belcher has been firm at from \$2.15@2.25. A few shares of Potosi were sold at 50c. Yellow Jacket, at from \$1.70@1.80. Union Consolidated, 95@70c. Hale & Norcross, in consequence of the reported first bar of bullion from the lower levels, has advanced from \$6.25@7.13; this stock is manipulated by San Francisco parties...

Plymouth Consolidated had a few sales, ex dividend, at from \$17.50@17.63. Quicksilver Common appears on the list with a sale of 200 shares at \$3.50. Green Mountain, sales of 1200 shares at 70c. Gold Stripe, 1200 shares at 7@8c. Bulwer shows the largest business in the Bodie group, and sold at 49@60c. Bodie, at from \$1.40@1.50. Standard, at \$1.10. Consolidated Pacific, at from 48@50c.

Reports from Colorado announce that the Bassick mine has been sold by the sheriff, the company not having sufficient funds to pay the various claims and the stockholders being unwilling to advance money. What the result will be can not yet be ascertained; but it is probable that a new company will be organized, that being the usual settlement of such difficulties. No sales of the stock are reported this week. Little Chief has been active, with sales of 4500 shares ranging from 25@29c. Robinson sold

from 54@60c. Lacrosse, at from 9@12c. Amie, at 2c. Breece, at from 12@15c. Leadville, at 37c.

The passing of the regular monthly dividend by the Father de Smet has no doubt caused the decline in the stock, which went from \$4.60@3.90. Homestake, its neighbor, comes to the front with its dividend of \$37,500; sales of 500 shares were made at \$15. Caledonia shows a business of 1400 shares, ranging from \$1.50@1.40.

Horn-Silver sold at from \$2.10@1.90, with sales of 3430 shares. Ontario sold at from \$25@24. Stormont records sales of 3000 shares, at from 12@9c. Alice sold 1200 shares, at from \$1.95@2. Central Arizona, 600 shares, at from 17@15c.

The total transactions during the week amounted to 82,248 shares, showing an increase of 43,061 shares, as compared with those of the preceding week. A complete summary of the market will be found elsewhere.

Coal Stocks.

The past week upon the Stock Exchange has been one of the wildest excitement. The business has been large and prices have been rushed up all along the list. All sorts of rumors have been brought out to accomplish this result, and the bears appear to have offered but little opposition. They apparently want the market put as high as it will go to make their turn more profitable. The foundation of the advance, however, has been continued rumors of negotiations looking to the purchase of Mr. Vanderbilt's interests in the State of Pennsylvania by the Pennsylvania Railroad and an adjustment of trunk line matters and general railroad differences. The coal stocks participated in this advance; for what reason it is hard to say, except that but little reason is displayed by the speculators at present. It is said "the market is going up," and that is about all they care for. They all expect to get out before the day of reckoning comes. There will, however, probably be a great number of slain left upon the field.

Lackawanna had dealings amounting to 290,978 shares, selling at \$93 3/4 on Saturday, \$101 yesterday, and closing at \$99 1/2 to-night. Delaware & Hudson, with transactions aggregating 13,650 shares, sold at \$77 1/2 @ \$81, and closed at \$80. Jersey Central, with sales of 33,800 shares, ranged between \$38 3/4 and \$40 1/2, and closed at \$39 3/4. Reading has been very quiet at \$16 @ \$13 3/4, closing at \$14.

COAL STOCKS.

Table of Coal Stocks with columns for Company Name, Par value of shares, Quotations of New York stocks (July 11, 13, 14, 15, 16, 17), and Sales from July 11th to July 17th inclusive.

\* Of the sales of this stock, 3650 shares were in Philadelphia and 6,510 in New York. Total sales, 352,116. † The quotations for these stocks are not percentage, but actual price.

Meetings.

Annual meetings of the following companies will be held at the time mentioned: Monarch of the Sea Mill and Mining Company, No. 42 Broadway, New York City, July 23d, from one to two o'clock P.M.

Dividends.

A dams Mining Company, of Colorado, has declared a dividend (No. 13) of \$15,000, or 10 cents a share, payable July 20th, at the Farmers' Loan and Trust Company.

Homestake Gold Mining Company, of Dakota, has declared a dividend (No. 83) of \$37,500, payable at the company's office, San Francisco, or at the Transfer-Agency of Messrs. Lounsbury & Co., Mills Building, New York, on the 25th inst. Total dividends to date, \$2,831,250.

Philadelphia & Reading Railroad Company, according to a special dispatch to Messrs. Collis & Levy, will pay its January coupons on its general mortgages on or before October 1st, and has arranged to reimburse Messrs. Drexel and Lowden Walsh for money advanced.

ASSESSMENTS.

Table of Assessments with columns for Company, No., When levied, Delinquent in office, Day of sale, and Amount.

\* Had been delinquent. Earlier date postponed until time mentioned. At a meeting of the Board of Directors of the Mayflower Gravel Mining Company, the assessment No. 30, of ten cents a share, was, by resolution, duly rescinded.

Pipe Line Certificates.

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

The strength of the oil market, so apparent last week, seems to have lost its force, and while a firm undertone appears to characterize it, prices have gradually ruled lower. It is said that the leading firm of oil brokers in Pittsburg who were at the head of the recent bull movement to 103 have realized a handsome little fortune, and will go out of business August 1st. This leads the bears to declare that the larger blocks of long oil having been marketed, price will naturally go off; but there are many who believe that it will sell higher than it has done this year so soon as the leaders have taken back their line.

The statistical situation remains of a decidedly bullish character. Oil closes to-night at 94 1/2%, and while it may have a further decline, we should consider it a purchase on any decided break.

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

Table of Oil Market Statistics with columns for Opening, Highest, Lowest, Closing, and Sales.

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

BOSTON, July 16. The market continues quiet, with limited transactions; in fact, only four stocks—Calumet & Hecla, Osceola, Quincy, and Tamarack—have been dealt in during the week. Just now, Tamarack is the center of attraction, and after cutting the Calumet lode, the price rose almost at a jump from about \$33 to \$67. This being an advance beyond reason, under the present circumstances of the property, the price rapidly declined to \$50, at which the stock is now offered. It is liable, however, to take a turn upward again at any moment on news from the lake. This new mine is likely to become, in time, an important element in the copper mining business. Its managers are by no means inclined to pose as rivals to the Calumet & Hecla; but a competitor it certainly will be, and the test will surely come as to which mine can produce its fine copper at the lowest cost, and in the long run it will be the concern to lead that shows the best record and results in intelligent and persistent economy. In this way, friendly rivalry may accomplish much good. Let the best win, as it surely will. Calumet & Hecla has advanced from \$175 to \$177, which is bid. One point, the development of the Tamarack, establishes for the Calu-

met that it almost certainly holds good the full extent to its own line—a thing of no little importance in itself. Osceola has sold sparingly at \$9 1/2, a fractional advance. Quincy declined from \$36 1/4 to \$34, on fears of a smaller dividend than had been anticipated; later, the price advanced fractionally. In other of the Lake Superior stocks great dullness and apathy prevail.

In silver mining stocks, the list is neglected—absolutely so. Bowman is very dull at 9c. bid, 10c. asked, with scarcely a transaction, because neither party will budge. Catalpa is heavy at 17c. Dunkin, nominal at 16@18c., and not much stock could be bought at the higher or sold at the lower figure. Consolidated Pacific not quoted this week. Many stocks do not sympathize with the more active movement in railroads but these are more or less "manipulated," while mining shares are not, in this market.

San Francisco Mining Stock Quotations.

Daily Range of Prices for the Week.

Table of San Francisco Mining Stock Quotations with columns for Company Name, July 10, 11, 13, 14, 15, 16.

The following is the financial condition of the companies mentioned, on July 1st. Most of the June ex. penses of some of these companies are not included in the statement:

Cash on hand July 1, 1885.

Table of Cash on hand for various companies like Utah, Con. Cal & Vir., Sierra Nevada, etc.

Mines in debt.

Table of Mines in debt for Potosi, Day, Grand Prize, and Savage.

\* Net on July 1st. † Estimated. ‡ Total to July 1st.

GERMANIA LEAD WORKS.

Works at Germania Station, Utah. Office at T. R. Jones & Co.'s Bank, Salt Lake City. MANUFACTURERS OF Perfectly Pure White Lead in Oil, Pure Red Lead, Pure Litharge, for Assayers' Use, Perfectly Pure Granulated Lead, Perfectly Pure Litharge, Perfectly Pure Test Lead Small Bars. All kinds of ores carefully sampled. T. R. JONES, Manager.

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Beverly.....	1.00		.90
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Bristol.....		1.10	
Bridgeport, Conn.....		1.00@1.05	.50
Brooklyn.....		1.00	
Buffalo, N. Y.....			
Cambridge, Mass.....	1.00@1.05†		.80‡
Cambridgeport.....	1.00@1.05‡		
Charleston, S. C.....	.75	.80@.90	
Charlestown.....	1.00		.80
Chelsea.....	1.00		.80
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Com. Pt., Mass.....	1.10		.90
E. Boston.....	1.00		.80
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Hartford.....			
Hackensack.....			
Hudson.....			
Lynn.....	1.10@1.25		
Marblehead.....	1.15		
Medford.....			
Millville, N. J.....			
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New Bedford.....	.90@1.00	1.05	.75
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Norwich.....			.75
Norwalk, Conn.....			
Pawtucket.....			
Philadelphia.....			
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Portsmouth, Va.....	.50		
Portsmouth, N.H.....	1.05	1.25	.90
Providence.....	.90	1.05	.70
Quincy Point.....			.90
Richmond, Va.....	.60		
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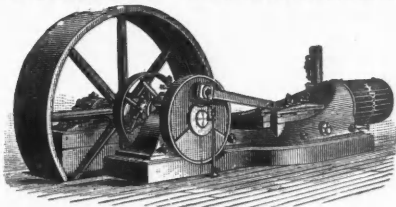
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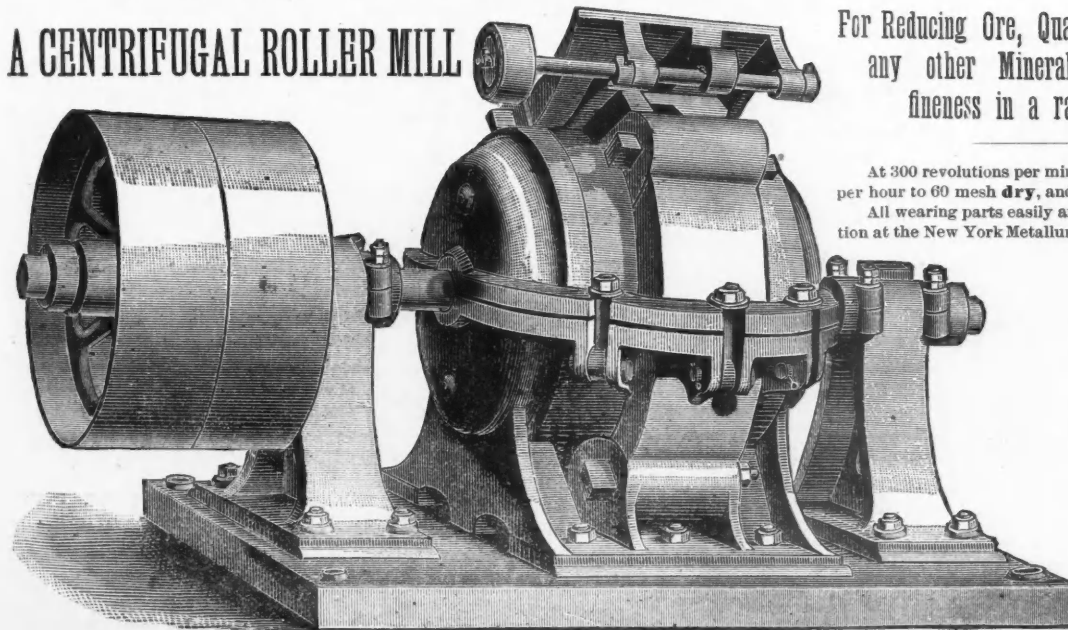
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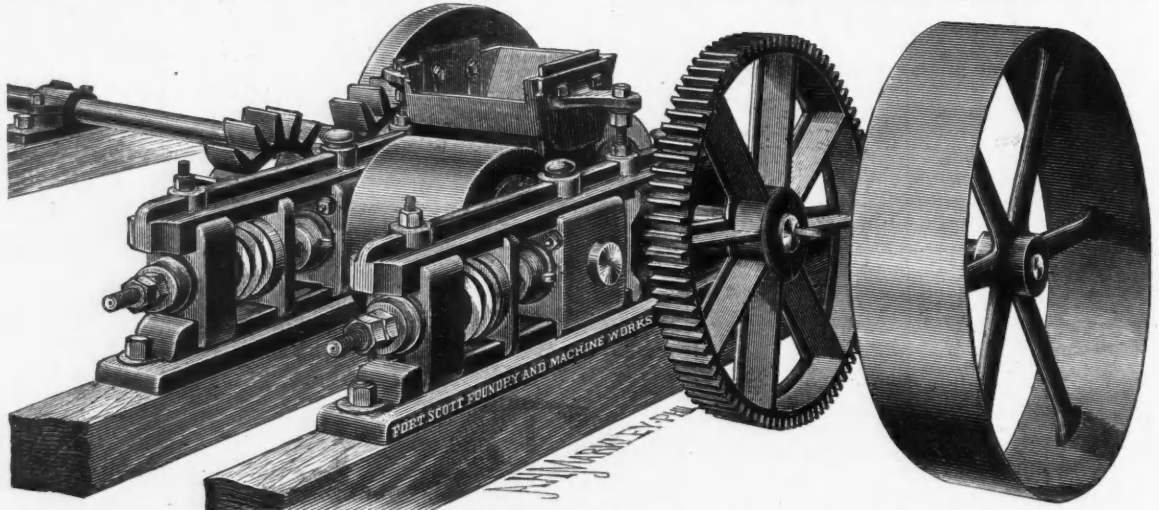
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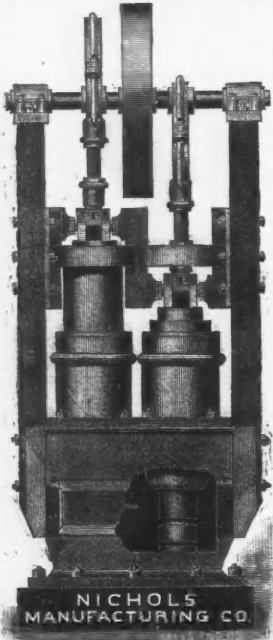
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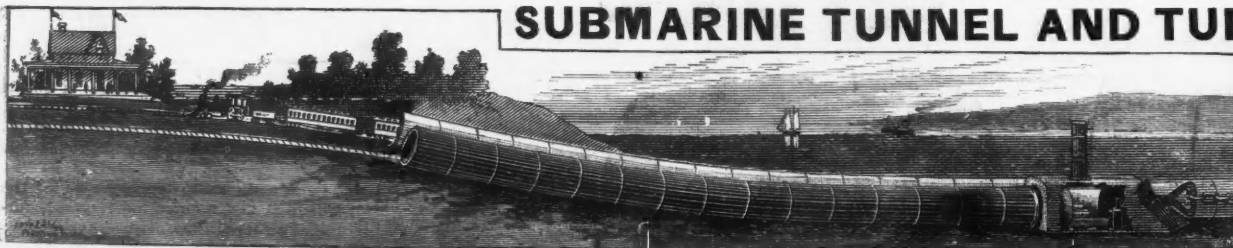
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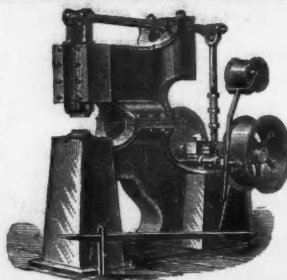
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