

# THE ENGINEERING AND MINING JOURNAL



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

VOL. XLVIII.

JULY 20.

No. 3.

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

Cable Address: "Rothw. 1," New York.

Books for review and all communications for the JOURNAL should be addressed, Managing Editor, P. O. Box 1833, New York.  
Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P. O. Box 1465, New York. Articles written by Mr. Raymond will be signed thus \*; and only for articles so signed is he responsible.

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

Mexico: Mr. R. E. Chism, M. E., Callejon Espirito Santo No. 4, City of Mexico.

Peru, South America: Mr. John Newton, No. 2 Calle Constitucion, Calla.

Australasia: Messrs. Moffat, Judd & Co., 11 Bridge street, Sydney, N. S. W.;

Mr. J. T. Partridge & Co., 134 Manchester street, Christchurch, New Zealand;

Mr. W. Forster, 56 Elizabeth street, Melbourne, Victoria.

SUBSCRIPTION PRICE, including postage:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, \$4 per annum; \$2.25 for six months; all other countries in the Postal Union, \$5.

Monthly Export Edition, all countries, \$2.50 gold value per annum.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

FILE COVERS will be sent by mail for \$1.00, or delivered at office for 75 cents each.

THE SCIENTIFIC PUBLISHING CO., Publishers,  
30 PHIA BRAEUNLICH, Sec'y & Treas. R. P. ROTHWELL, Pres. & Gen'l Manager  
P. O. Box 1833. 27 Park Place, New York.

The Table of Contents will be found at the end of the reading matter, page 62. Advertising Rates, page XI.

THE latest fad in chemistry is the remarkable extent to which its relationship to mathematics has been carried by some theoretical investigators. Shall we see the chemist of the future sitting at his desk and saying, "Let  $x$  = the unknown quantity," and evolving by higher mathematics the answer to the problem, letting it be what it may? His result could not well be disputed, for it will be proven, and figures cannot lie.

THE collection of the mining statistics of the eleventh census has been placed in charge of Dr. DAVID T. DAY, the chief of the division of mining statistics and technology of the United States Geological Survey. The appointment is highly to be commended, since Dr. DAY has already a considerable experience in this field, gained while compiling the annual reports entitled, "Mineral Resources of the United States," and his assistants may be said to have been undergoing for a series of years a course of light training for the coming great effort. The organization of the division of which Dr. DAY is now the head, as it at present stands, is a valuable nucleus for the larger force which will be needed for the more extended work in view, and by utilizing it much time and a great deal of experimenting with personnel and methods will be obviated; while the work to be done on this census report and the training it will give the staff will be available to render still more valuable the reports on our mineral resources, published annually under the direction of Dr. DAY. In every respect, therefore, this appointment is worthy of commendation and reflects credit upon the good judgment of Mr. ROBERT P. PORTER, the superintendent of the census.

## A WORLD'S FAIR IN 1892.

The great success of the Paris Exposition now in progress has added force to the movement so long under advisement for holding a great world's fair in New York in 1892, and the matter has so far become a practical question that the Mayor of this city has invited several hundred prominent citizens to meet at an early date and discuss the subject. Speaking for the great engineering industries, which the ENGINEERING AND MINING JOURNAL has long had the honor of representing, we feel assured we voice a practically unanimous wish that such an exhibition shall be held, and we can confidently answer for it that it will be a great success in the departments of mining, metallurgy, railroad, hydraulic, electrical and mechanical engineering.

It is not necessary at this late day to enter into any argument to prove the enormous benefit that comes to industry through these opportunities of comparing the products of the skill and ingenuity of the whole world. Countries, like individuals, which compare themselves with themselves only, are apt to become vain and self-conceited, and it is wholesome to have an opportunity occasionally to compare our own with the works of others, and to realize that no one people has a monopoly of skill or knowledge. Some of the lessons such an exhibition teaches are none the less valuable because they tend to inculcate modesty and respect for our neighbors. A people as intelligent as ours has nothing to fear from show-

ing the things in which we excel the rest of the world. On the contrary, we will gain directly in proportion to our ingenuity and intelligence, and while teaching others something, we will acquire far more than we give.

By all means let us have a world's fair in 1892, and there should be no delay in putting the project in practical shape. The time is already very brief, and every American would like to have this enterprise equal at least to any of the brilliantly successful expositions which have preceded it. The occasion—the anniversary of the fourth centennial of the discovery of America—is worthy of a fitting celebration.

## THE NEW INSTRUCTIONS GOVERNING THE FREE ENTRY OF SILVER-LEAD ORE.

We print, in another column, the new instructions issued by the Treasury Department to the Collectors of Customs on the Mexican frontier. It is stated by the department that these instructions do not affect the main questions at issue; but no doubt, had there been any intention to change the present ruling, these instructions would not have been issued at this time.

It seems fair, therefore, to conclude that the settlement of the question of the intent or interpretation of the existing law regulating the entry of silver-lead ore is to be left to Congress, and until it has been changed by new legislation, the ruling which has been in force in the past will continue, except so far as modified by these instructions.

This decision is in full accord with the views taken by the ENGINEERING AND MINING JOURNAL, and, as we believe, is both just and wise.

On the face of the instructions there would seem to be a desire to impose no unnecessary restrictions on the business as now carried on, and the collectors are specially instructed to report any obstacles that may arise in their execution, and the exact nature and extent of the obstruction, and suggestions for its removal.

Nevertheless it appears to us that some of these "instructions" are scarcely business-like or even practicable of execution. For instance, clause 2, which requires that there shall be no mixing whatever of ores from different mines, would, if literally enforced, shut out all small producers, who could not ship carload lots, and also all concentrating and sampling works where the products of many small producers are necessarily mixed. The intent of the instructions is evidently and properly to prevent the mixing of high grade silver ores with lead ores very low in silver with the object of getting the lead in free, while it would in fact prevent the mixing of ores each of which could come in free of duty if shipped alone. The mere fact that the instructions, which are intended to interpret the meaning and intent of the law, will themselves require further instructions to interpret their intent should inspire a certain amount of charity in the minds of those who have been so emphatic in denouncing the execution of the law in the past.

## THE HOMESTEAD STRIKE ENDED.

On the 13th inst. the men employed at the Homestead mills agreed upon a compromise between the scale offered by Mr. ANDREW CARNEGIE and his associates and that framed by the Amalgamated Association, thus ending the strike. Most of the concessions were on the part of the men, so that Mr. CARNEGIE may fairly claim to have scored the victory. The average reduction is figured at 20 per cent on the wages of skilled workmen as against the reduction (stated to have averaged 25 per cent) offered by the proprietors. The new scale is a sliding one, and holds for three years from July 1, with opportunity for revisions from time to time, according to market fluctuations. The steel mills which accepted the Association scale, as most of them did, are bound by it for one year. Mr. CARNEGIE has made the point, that by the introduction of improved machinery in his mills men working on certain kinds of piece-work were enabled to turn out more work and earn better wages than appeared on the face. The original sliding scale proposed by CARNEGIE, PHIPPS & Co. (Limited) was published in part by the *National Labor Tribune*, and was freely discussed by the workmen. We have already (ENGINEERING AND MINING JOURNAL, June 29th) quoted the scale formulated by the Amalgamated Association, and accepted by a majority of the works. We print elsewhere in this issue an abstract of the compromise memorandum finally agreed upon, and with it some interesting figures showing earnings which would have been made under the CARNEGIE proposition, based on the results of the May workings.

The final decision is that for the six months beginning July 1, 1889, the wages should be paid on a basis of \$26.50 as the selling price of Bessemer 4 x 4 inch steel billets. This will be in force until January 1, 1890, at which time the average selling price for Bessemer steel billets for the last six months of the year will be determined. The wages for the first three months of the year 1890 will be gauged by the average selling price fixed by the committee. At the expiration of the term of three months, the basis for the following three months shall be the average selling price for steel billets for the three preceding months. The compromise scale is at least clear and consistent. To a certain extent any sliding scale is in the nature of a cooperative agreement, and the periods of adjustment admit of as close a following of the markets as is possible, or at least convenient.



other industries are, very wisely, to be supplied at figures at least as low as at present.

The annual consumption of salt in this country and Canada is now about 14,000,000 barrels, of which about 4,000,000 barrels is imported or produced by concerns not controlled.

The 70,000,000 consumers use, therefore, only about  $\frac{1}{4}$  barrel *per capita* annually, and the proposed increase of 15 cents a barrel, if it were not multiplied in passing through intermediate hands, would amount on an average to only three cents *per capita* increase; and as the price is to be advanced on only a portion of the salt, it may be assumed that \$1,000,000 a year is all the new company would at present expect to get through the increase in its selling price of salt. This sum would, of course, be greatly increased when it came to represent the amount of the cost to consumers.

This is briefly the plan and the aim of the new combination. It controls nearly seven-eighths of the present production and importation of this country and Canada, but such important concerns as the Retsof Mining Company, the only rock salt mine in this country except the Petite Anse mine in Louisiana, is not included in the new concern.

The known salt deposits of this country in Louisiana, in Kansas, in Michigan, in New York, in Ohio and West Virginia and other places, can not possibly be controlled, and as other large producers may work just as economically and with just as perfect plant as the great Anglo-American Company, there is no prospect of any permanent large increase in the selling price of salt. Moreover, as many new plants will be promptly erected, with the view of selling out to the "trust," the future of the great combination does not appear to be altogether unclouded. At first the combination may buy these competitive works, but it will soon be found that to buy all will require so much capital that the price of salt must be largely advanced to cover this additional investment, while the more it is advanced the more it will stimulate the opening of new salt plants. The other horn of this dilemma is that the combination will rigorously decline to buy the new works, and the result of this will be that the market will be promptly over-supplied, and the price of salt will decline instead of advancing, and the profits of the new company will disappear. It is almost needless to say that there is little probability that any of the present promoters or the owners of salt works will then be found to hold the "securities" of the North American Salt Company, Limited. The dear public will then have them all, and will again be able to appreciate the practical working of trade combinations or trusts.

We refer the reader to a statement by the company in our advertising pages, where the constitution, prospects and aims of the new company are given officially.

#### 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.

#### Mineral Wax—A Rejoinder.

EDITORS ENGINEERING AND MINING JOURNAL:

SIR: Dr. Henry Wurtz, in your paper of July 13th, maintains that mineral waxes are compounds of the olefine series and not of the paraffine series, and claims to have conclusively proved that statement. He also adds that the most competent chemists share his view. A careful examination of the leading authorities at my disposal fails to corroborate this theory. The "United States Dispensary," the chemical portions of which were very carefully written by Prof. S. P. Sadtler, of the University of Pennsylvania, and an admitted authority on such bodies, says of ozocerite: "It is a mixture of natural paraffines." William T. Brannt, in his "Treatise on Animal and Vegetable Fats and Oils" (1888), states that "ozocerite consists of solid paraffine and light hydrocarbons." Roscoe and Schorlemmer, in their "Treatise on Chemistry," in writing of the occurrence of paraffine in nature, say: "Similar compounds occur as mineral in the coal measures as well as in the deposits of brown coal and bituminous shale. These are known under the name of ozocerite, mineral tallow and mineral wax." I had always supposed that the authorities mentioned took rank among "competent chemists." In the recently issued volume of "Wagner's Jahresberichte," a résumé of an elaborate paper on mineral wax is given, in which it is stated that the variety obtained in Galicia yields from 36 to 50 per cent paraffine. On competent authority I have been informed that the mineral wax of Utah is even richer in its yield of paraffine.

New York, July 17, 1889.

Respectfully, MARCUS BENJAMIN.

#### Plymouth Consolidated Gold Mining Company.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Referring to the conversation I had with you June 20 in reference to Plymouth Mining Company, I inclose a clipping showing their report for past six months. What I said then as regards the insiders working the market to obtain stock is partly verified by this report. It shows plainly that they have curtailed their product purposely, when there is no excuse whatever why 80 or 120 stamps should not be working instead of 40. They take particular care to have these reports issued every month, so that stockholders can see how little progress is being made. Why do they not issue a report explaining actual condition of mine? These reports show just enough to make timid stockholders let go their stock, and there is some one on the floor of the Exchange to buy all that is offered at their prices.

Of course, a great many of the smaller stockholders do not comprehend many of the little tricks resorted to to shake them out of their stock, and

it would be but a simple act of charity to them for some reputable journal to write up this entire affair in a manner to assure them that the mine is not a "hole in the ground," and that the managers are undoubtedly manipulating the stock so they can buy back such stock as they sold at higher prices. Just previous to the fire the output was about \$85,000, without touching their higher grade of ore, and it seems almost improbable that they have reached the end of their large ore body.

Any one who has visited the mine knows that Plymouth has yet a very large ore body untouched, and that, with proper management, it can pay dividends for several years to come.

Something ought to be done to save so good a property to the benefit of the honest stockholders, and not leave the management to those who are evidently doing their best to depreciate its market value. A great many of your readers, who hold this stock, would appreciate any effort on your part to relieve them of the anxiety they now feel regarding the future prospects of this mine, and as one of them I hope you will find it within your line of duty as editor of a mining journal to "turn on the lights."

NEW YORK, July 15, 1889.

"JURISTON."

P. S.—Since writing you in reference to the Plymouth mine, I am informed by the secretary of the company that they have been cutting a tunnel from Pacific shaft on No. 2 level into "Indiana" claim, owned by the Plymouth Mining Company. This worked against them in June output, and may do so in July. This claim is said to contain very good ore and has not been worked as yet.

#### South African Gold Fields.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your edition of the 8th ult. you republish from the Boston Herald my opinion of this district. The correspondent, in condensing, in order to cable over, has somewhat misrepresented my meaning. The following is briefly my opinion of the Rand, or Johannesburg District, in the Transvaal, South Africa.

The rocks of this district have evidently been deposited from water. On the northern and eastern rim or edge, the formation has been tilted up to an angle of 45 to 25 degrees from the horizontal by the irruption of igneous rocks. The same formation will probably be found on the south and west, thus forming a basin that will probably measure over 80 miles east and west, and 40 miles north and south. In this basin are found numerous strata of conglomerate, locally called "basket" reefs, which are in reality nothing but contact veins of conglomerate, carrying gold in varying quantities in the different reefs, though each, individually, is fairly uniform in quality and thickness.

With the exception of the Main and Black reefs, these reefs have been little worked, and have different names in different localities or mines. Commencing with the lowest, or at the bottom, the principal ones are generally known as follows: Bothas Reef, Du Preez Reef, Main or Bantje Reef, Middle Reef, South Reef, Bird Reef, Chimes Reef, Atwell Reef, Kimberley Reef, Raas or Aurum Reef (or Ellsburg Group), Zuur-Bult Reef, Black or Harris Reef.

These reefs or veins vary much in their mill-yield, from  $\frac{1}{4}$  ounce of gold on the Main Reef to 6 ounces per ton on the Middle Reef. The other reefs have been comparatively little worked. The average monthly yield in the mill of the Black Reef is 15 pennyweight and of the Zuur-Bult 1 ounce per ton. Many of the other veins have been opened and assayed well. In no part of the world have veins been found giving such a continuous and uniform yield of gold. The Main Reef has been worked for a distance of thirty miles continuously, and with a few breaks it has been tested and worked twenty miles further. The lowest yield has been 7 pennyweight per ton, which will pay a good working profit when work is thoroughly organized on a large scale.

The deepest workings at present in this district are about 250 feet down on the dip of the vein. The ore found there is equal in quantity and quality to that found in the upper workings. As the yield of the vein is so constant and uniform in length, there is no apparent reason why it should not be equally so in depth.

With well organized work on a large scale, the total average cost of mining and milling ore from most of the veins here should not exceed \$4 per ton; in many cases it should be done for less. There is abundance of good, cheap, unskilled labor, good coal is found near the mines, in some cases less than a quarter of a mile distant, and food for man and beast will ultimately be cheap, as there is abundance of land that can be irrigated that can raise more than will be required for home consumption. The scarcity of timber and skilled labor is the only drawback to cheap mining. The present cost of these will, however, be largely reduced by the construction of railways, which will probably take place in the near future. These estimates of the cost of mining and milling are based upon my experience and observation in the gold producing districts of the United States.

Much of the first work done on the mines here was expensive and imperfect, but it is now being done much better. Many mills were built before the mines were sufficiently opened to supply them regularly with ore. There are, at present, about 1,100 stamps in this district, but only about 800 of these are running, the others being idle, principally for want of ore, owing to the mines not being sufficiently opened.

The total monthly crushings run from 40,000 to 45,000 tons. The total yield last May was 35,000 ounces of gold, or rather over three-quarters of an ounce per ton.

In 1887 South Africa produced only two per cent of the total gold product of the world; in 1889 the yield will be at least seven per cent, and in 1890 it will probably be over twelve per cent. of the total. Unless there is a corresponding increase in the production of silver, this large increase in the yield of South Africa in gold will depreciate the comparative value of gold, and enhance that of silver.

This will be very good and profitable for the United States Treasury, which holds such large quantities of silver.

Big reports and very rich specimens come here from the northern districts, but as I have not seen the mines there, I can say nothing about them from personal knowledge.

This district promises to be the most constant in pay and the most productive gold region ever discovered, and investments made with judgment at moderate prices will yield large returns.

I am sir, yours, etc.,

EDWARD BATES DORSEY,  
M. Am. Soc. C. E.

INTERNATIONAL CLUB, LONDON, July 6, 1889.

**TREASURY RULES FOR THE ADMISSION OF MEXICAN SILVER-LEAD ORES.**

The Secretary of the Treasury has sent the following letter of instructions to the Collectors of Customs at El Paso, Laredo and Eagle Pass with reference to the admission of silver-lead ores, pending the settlement of the question now before the Treasury Department in regard to the proper classification of such ores. It is stated at the department that these instructions do not affect the main questions at issue.

"The department has had under consideration the joint report submitted by Special Agents W. H. Williams and W. P. Hodgson, under the question of the importation of mineral ores from Mexico, with special reference to the accuracy and propriety of the existing methods of entry, sampling, and examination of such ores, for the purpose of determining their legal classification by an accurate ascertainment of the characters and properties of the minerals contained in the various importations.

"It appears from the report that a practice has grown up of permitting in the same entry as the product of one mine the mingled product of several mines possessing different characteristics, and that sampling is conducted in a very irregular manner by what is familiarly known as the 'grab process.' It is evident that neither of those methods is adapted to a proper execution of the provisions of the general law respecting importations of merchandise, and that a modification is essential to bring its administration into harmony with the requirements of the law. Pending a further consideration and the determination of the question of the proper classification of those Mexican ores that contain both silver and lead, the following instructions will be observed:

"1. The sworn entry shall embrace, in addition to what is now required, a statement of the estimated quantities and values of silver and lead contained in the importation, according to the best knowledge and belief of the importer or consignee.

"2. The entry shall further contain a declaration that the importation embraces no mixture of ores or concentrates from different mines.

"3. The entry shall also disclose the name and locality of the mine from which the ore has been taken.

"4. Upon the arrival at the frontier of cars or other vehicles laden with ores containing an appreciable quantity of lead, they shall be locked or otherwise secured until entry be made and permit granted to unlade.

"5. Upon the unloading, and at the time of unloading, the officer of the customs assigned to that duty shall supervise the work, and shall obtain proper and adequate samples from those taken for commercial purposes by the importer or consignee; that is to say, they shall be taken in the manner approved and practiced by miners in the handling and reduction of ores, by thoroughly mixing and quartering every tenth shovel, or more, repeating the operation until the usual commercial sample be obtained.

"6. To avoid the detention and expense incident to the unloading and sampling at the frontier, in cases where the cars or other vehicles are destined to an interior port or place without so unloading, they shall be adequately inspected, and if in the judgment of the Collector the ore is deemed to contain lead in quantity sufficient to make it dutiable, or if the legal classification be held doubtful, appraisement may be waived and entry made on an estimate of duties, and the goods permitted to proceed to destination under a warehouse and transportation bond, the entry to be ultimately liquidated under an appraisement based upon the samples selected in the manner above prescribed in paragraph 5.

"It is suggested that in the execution of these instructions care should be taken equally not to unnecessarily detain ores wherein silver so clearly predominates as to fix their character commercially as silver ores, nor to admit without assessment of duty those ores wherein the value of their components of lead appear to exceed that of the silver contained in such ores. It is further advised that in determining the relative values of silver and lead contained in the same ore the value of the silver component, in the absence of more accurate data in the invoice or otherwise, be rated at 95 per cent of the latest known value of silver bullion in the New York market, and the value of the lead component at the latest known price of bar lead in the same market, less one cent per pound.

"From the information before the department it is believed that neither difficulty nor hardship will result from the practical enforcement of these instructions, but if any obstacle shall arise in their execution, you will please report the exact nature and extent of the obstruction, with your suggestions for its removal."

**THE HOMESTEAD COMPROMISE WAGES SCALE, AND COMPUTED WAGE EARNINGS.**

The following is a memorandum of the compromise agreement between Carnegie, Phipps & Co. (Limited) and the Amalgamated Association of Iron and Steel Workers, covering the Homestead Steel Works, alluded to in another column:

1. Period of time agreed to from July 1, 1889, to July 1, 1892.
2. The rates, when agreed to, to obtain for six months from July 1, 1889, to January 1, 1890, and the average selling price to be the basis upon which the wages shall be paid for the next three months. The rate to change every three months thereafter, based upon the average selling price of the preceding three months. The standard grade 4 x 4 Bessemer billets to be the basis of price.

A committee to be appointed consisting of three members of the Amalgamated Association national officers and three members of the firm to determine the average selling price each period, and in the event of these six men not agreeing, a seventh disinterested party to be chosen by them, whose decision shall be final.

All day labor, except common labor, to be paid the same rates as were paid prior to July 1, 1889, and not to be included in the sliding scale.

The following classes of labor shall be included in the three years' agreement at existing wages for the whole term: All engineers, all water-tenders, pressure-pump men, traveling cranes, narrow-gauge locomotive engineer, river-pump men, millwright, gas-tender and stocking-gang for blooming-mill.

The wage-scales for the different departments having been considered and agreed upon, copies of the same are furnished herewith to each party.

The foot-notes on last year's scales are to be applied to the new scales.

In the course of the discussion, Mr. W. L. Abbott, of Carnegie, Phipps & Co. (Limited), addressed a letter to Mr. Weihe, President of the Amalga-

mated Association, in which he wrote: "Permit me to submit some figures for your consideration. They show the wages that would have been earned under the new [Carnegie proposition] scale, based upon the actual output of the Homestead Steel Works for the month of May, 1889."

**CONVERTING MILL.**

Position.	Number of men.	Rate per 100 tons.	Daily earnings as estimated on basis of May tonnage.	Earnings for May of each man.	Actual daily earnings, basis of May tonnage.
Cupola man.....	1	\$1.70	\$3.75	\$126.00	\$5.04
Vessel man.....	1	1.70	3.75	126.00	5.04
Pourer.....	1	1.59	3.50	117.80	4.71
Blower.....	1	1.48	3.25	109.65	4.39
Spiegel man.....	1	1.36	3.00	100.75	4.03
Fit men.....	10	1.36	3.00	100.75	4.03
Stopper-setter.....	1	1.25	2.75	92.60	3.70
Sadle man.....	1	1.18	2.30	87.40	3.49
Cupola helpers.....	2	1.14	2.50	84.45	3.38
Bottom-makers.....	1	1.14	2.50	84.45	3.38
First regulator.....	1	1.09	2.40	80.75	3.23
Crane-shifters.....	3	1.09	2.40	80.75	3.23
Vessel man's first helper.....	1	1.09	2.40	80.75	3.23
Cinder men.....	3	1.09	2.40	80.75	3.23
Vessel man's second helper.....	1	1.02	2.25	75.55	3.02
Bottom-maker's helpers.....	2	1.00	2.20	74.10	2.96
Mould-sanders.....	2	1.00	2.20	74.10	2.96
Cinder tapper.....	1	.95	2.10	70.40	2.81
Rack man.....	1	.95	2.10	70.40	2.81
Iron-craze man.....	1	.95	2.10	70.40	2.81
Ingot-extractor.....	1	.95	2.10	70.40	2.81
Stopper maker.....	1	.95	2.10	70.40	2.81
Metal-wheelers.....	3	.91	2.00	67.40	2.70
Cinder-snappers.....	2	.91	2.00	67.40	2.70
Ladle man's helper.....	1	.91	2.00	67.40	2.70
Ingot-extractor's helper.....	1	.91	2.00	67.40	2.70
Coke-wheelers.....	2	.86	1.90	63.70	2.55
Second regulators.....	3	.86	1.90	63.70	2.55
Mould Washer.....	1	.86	1.90	63.70	2.55
Steel-crane man.....	1	.86	1.90	63.70	2.55
Total tonnage, 14,818 tons; tonnage per turn, 7,409 tons.					

**28-INCH BLOOMING MILL.**

Screw man.....	1	\$3.10	\$6.00	\$150.00	\$6.00
Heater.....	1	3.10	4.50	118.00	4.72
Rougher.....	1	2.59	3.75	98.50	3.94
Point-in-hook.....	1	1.90	2.75	72.25	2.89
Shear man.....	1	1.90	2.75	72.25	2.89
Turn-up-hook.....	1	1.90	2.75	72.25	2.89
Bottom men.....	2	1.79	2.60	68.10	2.72
Hookers.....	3	1.72	2.50	65.40	2.62
Furnace men.....	6	1.55	2.25	58.95	2.36
Tong men.....	1	1.55	2.25	58.95	2.36
Shear man's help.....	1	1.52	2.20	57.80	2.31
Dragout.....	1	1.52	2.20	57.80	2.31
Butt-wheeler.....	1	1.38	2.00	52.50	2.10
Pull-around.....	1	1.38	2.00	52.50	2.10
Shear pulpit.....	1	1.21	1.75	46.00	1.84
Pulpit man.....	1	1.21	1.75	46.00	1.84
Cover men.....	2	1.14	1.65	43.35	1.73
Total tonnage, 7,808 tons; tonnage per turn, 3,904 tons.					

**23-INCH MILL.**

Roller.....	1	\$6.00	\$140.00	\$5.80	\$6.00
Heaters.....	3	\$6.92	4.50	89.25	3.57
Catcher.....	1	5.77	3.75	74.43	2.98
Rougher-down.....	1	5.38	3.50	69.40	2.78
Rougher-up.....	1	4.62	3.00	54.60	2.38
Sticker-in.....	1	4.23	2.75	54.60	2.18
Straightener.....	1	4.23	2.75	54.60	2.18
Heater's first helpers.....	3	4.00	2.60	51.60	2.06
Hookers.....	6	5.69	2.40	47.60	1.90
Hot-straighteners.....	2	3.46	2.25	44.60	1.78
Buggy man.....	1	3.46	2.25	44.60	1.78
Heater's second helpers.....	3	3.23	2.10	41.65	1.67
Charges and drawers.....	8	3.23	2.10	41.65	1.67
Day turn, 1,290 tons.					

In addition to the above, wages of 13 men, making \$14.50, changing rolls, which is not included in earnings.

\*\$1 per month and 3 1-10.

**33-INCH BEAM MILL.**

Roller.....	1	\$5.80	\$166.30	\$6.65	\$5.80
Heaters.....	3	\$11.00	4.50	132.40	7.29
Catcher.....	1	8.89	4.00	147.40	5.90
Rougher-down.....	1	7.78	3.50	129.00	5.16
Rougher-up.....	1	7.22	3.25	119.70	4.79
Straighteners.....	2	6.67	3.00	110.60	4.42
Hookers (front).....	4	6.11	2.75	101.30	4.05
Sticker-in.....	1	6.11	2.75	101.30	4.05
Heater's first helpers.....	3	5.78	2.60	95.80	3.83
Chargers.....	4	5.55	2.50	92.00	3.68
Hookers (back).....	3	5.55	2.50	92.00	3.68
Buggy man.....	1	5.00	2.25	82.90	3.31
Heater's second helpers.....	3	4.67	2.10	77.40	3.09
Buggy man's helper.....	1	4.67	2.10	77.40	3.09
Hot-bed men.....	4	4.67	2.10	77.40	3.09
Saw man.....	1	4.67	2.10	77.40	3.09
Rack men.....	2	4.44	2.00	73.60	2.94
Straightener's helpers.....	12	4.44	2.00	73.60	2.94
Hydraulic telegraph.....	1	3.78	1.70	62.65	2.50
Total tonnage, 3,317 tons; tonnage, one turn, 1,658 tons.					

\*\$100 per month and \$4.

**119-INCH PLATE MILL.**

Roller.....	1	\$6.80	\$181.50	\$7.26	\$6.80
Screw man.....	1	\$6.93	5.00	145.65	5.83
Shear man.....	1	8.93	5.00	145.65	5.83
Table man.....	1	8.04	4.50	131.10	5.24
Heaters.....	2	8.04	4.50	131.10	5.24
Second shear man.....	1	5.80	3.25	94.60	3.78
Hookers.....	2	5.36	3.00	87.40	3.50
Heater's helpers.....	2	4.64	2.60	75.70	3.03
Sweepers.....	2	4.02	2.25	65.60	2.62
First leader.....	1	4.02	2.25	65.60	2.62
Second leader.....	1	3.93	2.20	64.10	2.56
Shear man's helpers.....	10	3.75	2.10	61.20	2.45
Crane man.....	1	5.36	3.00	87.40	3.50
Crane man's helper.....	1	4.02	2.25	65.60	2.62
Product on each turn, 1,631.					

\*\$100 per month and \$5.

As the compromise arrived at closely approximates the Carnegie proposition, the foregoing figures are of interest as showing the relative rates of wage earnings in a great steel works.

**The Eiffel Tower Light.**—The electric beam from the Eiffel tower lantern has a luminous intensity of about 55,000 candles. Catadioptric rings are arranged to make the light stronger and stronger as it travels from the tower, so that in clear weather its range—if not limited by the earth's curvature—should be 127 miles, with an intensity of 5,000,000 candles.

THE "SAMSON" COAL GETTER.

We illustrate the new device, patented by Messrs. Sharpe & Tennant, of Measham, England, for coal getting, which has been named the "Samson."

This machine, says our contemporary, the *Colliery Guardian*, is the outcome of numerous experiments in many varieties of coal and stone, and is now successfully at work in the Manchester and Wigan districts, and is gradually finding its way into other parts.

One colliery manager reports: "The machine pays for itself in the extra percentage of large coal it produces alone."

With respect to the machine itself, it will be seen on referring to the illustration that the central screw takes its bearing in the block at the far end of the hole, which becomes the fulcrum, and the nut in the top shoe is the place where the power is applied. The screw is turned in the direction suitable for drawing the top shoe towards the operator; in sliding over the lower shoe the combination of wedge-shaped shoes expands and takes a firm grip of the coal. By continuing the action of the screw a longitudinal force of about 50 tons is exerted, which draws off the coal which has been holed from the solid face. At the same time a downward pressure of about 300 tons is exerted by the shoes, and the resultant of these two forces is a diagonal which is found efficacious in bringing out the coal as well as bringing it down.

The enormous strain of 50 tons has to be taken by the screw in compression, and there is apparently a risk in its bending. This strain, however, is only brought upon a very short length of screw, namely, that between the nut and the fulcrum, so that the screw need not be larger than is necessary to prevent crushing. This peculiarity has conducted materially to the success of the machine, the first experiments having been made on a series of wedges extending along the hole, and the strain being communicated through a considerable length of screw, bending of the screw took place, and crippled the apparatus. In consequence of the coal being allowed to separate itself from the solid face, the quantity brought down by each operation is far in excess of that by an explosive, and thus the number of holes to be drilled in the face is reduced. In one colliery where

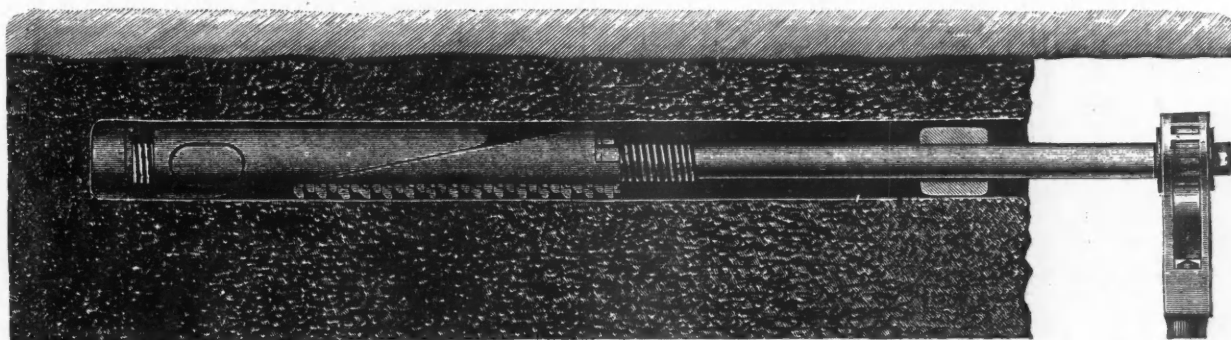
depends on a multitude of considerations, namely, on their sources, modes and economies of production, and on their essential and inherent qualities, which vary exceedingly. Also on their special and individual applicabilities to diverse practical uses, in which they diverge widely.

There are a number of other considerations which come in here, such as their convenience of handling, storing, conveying and distributing, their relations to human health, their diffusibility and explosibility, and some others which will be brought out in future discussions. The present paper must be mainly confined to mere practical classification, which will be found a sufficiently large and complex subject.

Of what may rationally be regarded as *primary species* of fuel-gases and vapors, there may be designated at least as many as *twenty-one*, all of which are either now in use, or probably will in time come into practical use, for different purposes of combustion or decombustion. These may be named as follows:

1. *Air Gases*, produced by the partial combustion of carbonaceous and hydrocarbonaceous combustibles, with deficient supply of air. As there are a multitude of such hydrocarbonaceous materials, as hard coals, soft coals, brown coals, lignites, cokes, charcoals, hard woods, resinous woods, peats, petroleum, asphalts, and so on, there is, of course, a correspondingly large possible number of varieties of such air gases. Common flue gases, blast-furnace gases and coke-oven gases furnish a few familiar examples.

Theoretically, one would think that the best or strongest gaseous fuels of this species ought to result from a supply to the combustible employed of just half the amount of air necessary for a complete combustion of its carbon, so that the maximum amount of carbon monoxide may be formed. Such an *a priori* view, however, applies practically to but few cases, there being several disturbing elements whose influences yet remain to be fully investigated. Indeed, the study of these air gases alone, including their numerous varieties, is plainly a huge subject of the future, and one that is quite assuredly pregnant with very important results. It ought indeed to be pointed out in this connection that, when rightly viewed, this study includes that of all our modes and apparatus for burning what are popularly looked on as *solid* fuels. There is



SAMSON COAL GETTER.

the "Samson" coal getter is used it is stated that as much coal was brought down at one fall, which took about 20 minutes, as was in the habit of being got in three days by the use of powder.

The manufacturers are Messrs. Wootton Brothers, Coalville, Leicester.

PRACTICAL CLASSIFICATION OF FUEL GASES.

Written for the Engineering and Mining Journal by Henry Wurtz, Ph. D.

Throughout many years the writer has expended much labor in collecting and preparing a large mass of materials for a work on *gaseous fuels*. As the completion of this work, however, seems still to remain in the dim distance, he has to suggest that a presentation, through the columns of THE ENGINEERING AND MINING JOURNAL, of a classification of a part, at least, of these materials, with such degree of elaboration as he can now afford, may be of use for the time being.

"Art is long, and time is fleeting."

Such introductory communication will serve at least to place before readers of the JOURNAL in a rather strong light the magnitude and complexity of this field of study. They will also, as he deems, thus arrive at some adequate view of the inadequate and fragmentary way in which this great field has been and still is being cultivated, and this in spite of the dominant importance it has confessedly assumed in recent years in the minds of men who think and work and wait. The JOURNAL has contributed more than all others to the opening of men's eyes to the approach of the lights that are to dawn from this quarter.

The writer suggests that we have here one of the numberless examples of what he regards as a great evil of our time, which is specialism. This now pervades all human pursuits, above all, on this our continent. General principles are no longer sought for or cared for. Laboratory research, never redundant with us, has now died altogether out. Pedagogism now seems to absorb and exhaust the best of America's philosophic brains, and has apparently concentrated itself into a barren focus of specialistic education.

The laboratory, moreover—the fountain head of human progress—is now with us too often a shop, a money-making machine, a sort of fifth wheel to the mud cart of the money-grabbers.

Those who strive to explore new paths, or even to generalize facts already known, are in the American popular mind now looked on as unpractical and unprofitable dreamers.

Gaseous fuels are very many in number. Their practical classification

little distinction, in a scientific sense, apparent between common anthracite or charcoal stoves, burning as they commonly do, with deficient air, and more or less production of carbon monoxide; and an air-gas producer.

2. *Steam Gas*, the common but less preferable term for which is "water gas," produced through the decombustion of steam by carbon. Theoretically this now familiar product is described by many writers as being a mixture of equal volumes of hydrogen and carbon monoxide. In practice, however, for more than one reason, the hydrogen predominates considerably in volume over the other main constituent. These reasons are: Firstly, that through deficient temperature during the operation, more or less carbon dioxide is formed; secondly, when anthracite or coke is as usual the agent of the decombustion, these always contain, and hence always evolve, some hydrogen; and, moreover, anthracite also always contains more or less iron disulphide or pyrites. Each constituent of this also decomposes its share of the steam, evolving hydrogen, without any carbon monoxide.

There is also always present in steam gas from anthracite small percentages of methane, ammonia and nitrogen gases, and in coke steam gas also some ammonia.

3. *Air-Steam Gases*, commonly called "producer gases," and by some (of the Germans, at least) "generator gases." The invention of this highly important species of fuel gas appears to be due, in its first inception, to an ingenious Frenchman, Georges Michiels by name, residing at the time (44 years ago) on the island of Guadeloupe—one of the many men of the past, whom the world is just now "catching up to," half a century or so after they have often died of starvation and despair in their garrets. The writer has a certified copy of his patent, as exhumed from a Washington crypt, issued to him in America, October 3, 1846, but antedated to May 24, 1845. This sets forth an air steam gas producer, with blast, essentially the same as those now in use; though, of course, improvements in details of working methods and construction have since been made.

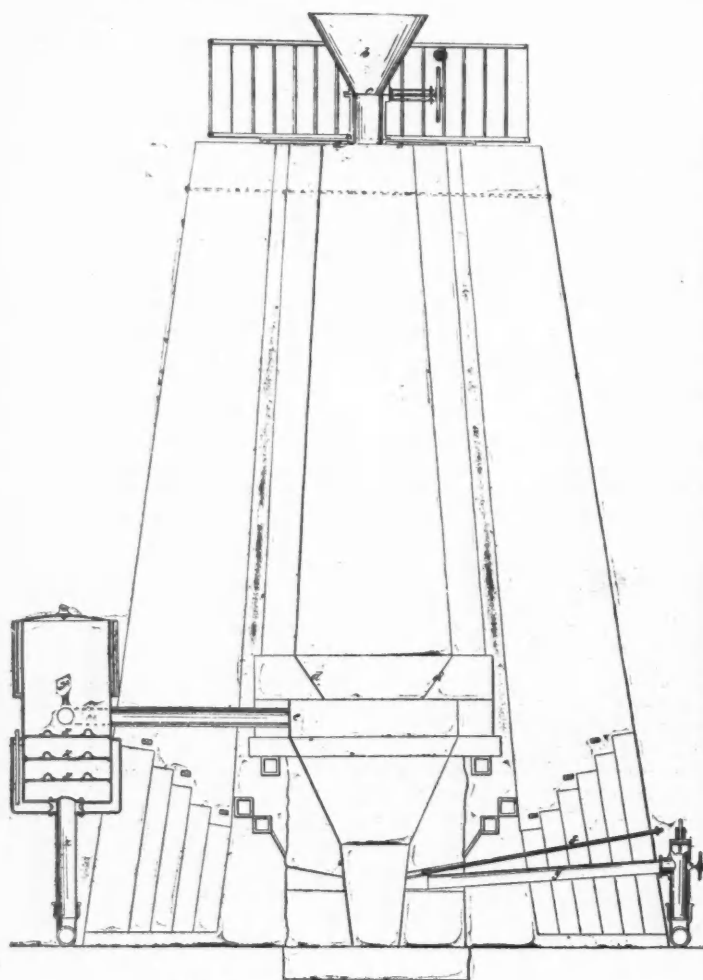
The gist of the air-steam fuel-gas method resides in the principle that the air maintains a combustion of a part of the fuel, thus producing a large amount of heat; this heat being needed to dissociate or decombust the intermixed steam, generating free oxygen, which combines with another part of the carbon to carbonic oxide, hydrogen being also produced. Thus there is a *continuous* production of mixed hydrogen, carbonic oxide and nitrogen. Michiels claims thus in his patent: "The manufacture of gas from anthracite, or equivalent, consisting in the employment of a *closed* furnace, combined with a gasometer and streams

or jets of heated steam and air, forced into the charge thereof, in the state of combustion."

As air-steam gases have already become of great practical importance, the writer may profitably introduce here some tabulations of the chemical composition of some of the varieties thereof. He has concluded as a result of considerable study of analysis on record, including some of his own, that there are clearly two, and it may now be well to make it three, important types or varieties of this species of fuel gas, namely, of so-called "producer gas:"

I. The Michiels gas, as above set forth.  
 II. The same, with the use of soft coal, instead of anthracite or coke (Siemens & Wilson producer gases, etc.).

III. So called "Dowson gas," characterized by a much larger content of hydrogen and less of nitrogen, improvements which have been maintained as adding value.



MICHEL'S GAS PRODUCER.

The following figures will throw some light upon the subject: (Other gases of this species will be hereafter referred to; some from woods, peats, lignites, and so on, by the air-steam producer processes.)

AVERAGE COMPOSITION.	Type I.		Type II.		Type III.	
	Vols.	W'ts.	Vols.	W'ts.	Vols.	W'ts.
Hydrogen.....	8.0	0.61	12.1	0.96	18.40	1.53
Carbon monoxide.....	19.7	20.38	23.5	26.16	24.70	28.67
Carbon dioxide.....	4.2	7.05	6.3	11.04	6.54	12.00
Marsh gas.....	3.8	2.31	4.7	2.99	0.06	0.04
Nitrogen.....	62.3	67.68	51.4	57.42	48.30	56.26
Water vapor.....	2.0	1.37	2.0	1.43	2.00	1.50
Totals.....	100.0	100.00	100.0	100.00	100.00	100.00

	Vols.	Vols.	Vols.
Specific gravities.....	.909	.87	.834
Specific heats.....	.274	.286	.359
Theoretical flame-temperatures.....	2727°	2940°	2914°*
Air needed to burn 1 pound.....	1.126 lb.	1.492 lb.	1.24 lb.
Air needed to burn 1 cubic foot.....	1.0233 c. f.	1.2974 c. f.	1.034 c. f.
Heat-units per pound.....	1836	2438	2194
Heat-units per cubic foot.....	127.5	162	140
Weight of 1,000 cubic feet.....	69.43 lbs.	66.44 lbs.	63.71 lbs.

\* The writer wishes to add, regarding the figures in this line, that he attaches little importance to them. Long study throughout many years has convinced him that the accepted methods of computation of so-called flame-temperatures of gases must involve serious fallacies. He hopes to return again to this part of the subject.

In future papers this table will be again referred to and discussed, and may be enlarged.

4 *Wood Gases.*—Of this species there are also varieties. Some have been mentioned already above as producible from air, steam and wood. Air alone, and steam alone, will also yield varieties. Others will proceed from employment of hard and of soft resinous woods, and there are other varieties formed during the dry distillation of different woods in close retorts, and these again vary much according to the temperature of the retort, whether the lower temperature at which woods are distilled to obtain wood alcohol, wood vinegar, etc., or the much higher heats used when wood gas is made for illuminating uses. There have been also made and used varieties of such gases from cork and bark, but only locally.

5. *Peat Gases*, of which varieties are producible in ways quite similar to those from wood.

6. *Lignite and Brown-Coal Gases.*—Both largely manufactured in some countries, as in Germany, California and elsewhere.

7. *Gases from Resinous Substances.*—As common resin, which have been often made for purposes of illumination.

8. *Gases from Vegetable and Animal Fats and Fatty Oils.*—These are of high illuminating value, and of a great number of varieties, but are too costly in general.

9. *Hydrogen Gas*, which, of course, in chemical composition and properties is of but a single variety when pure, but the several modes of its production, which will be hereafter gone into, afford some points of practical classification.

10. *Carbonic Oxide Gas.*—The same remark may be said here as in the case of hydrogen, the modes of production being the primary, practical matter of interest. With both hydrogen and carbonic oxide strongly important practical considerations are relative density, diffusibility, inflammability, explosibility, respirability and others, which will be treated of hereafter.

11. *Natural Gases*, of which there are some not belonging to the fuel gases, being composed of carbonic acid, or nitrogen or other incombustible components. Methane, or marsh gas, is the main natural fuel gas, occurring as rock fire-gas, the fire-damp of coal mines, and so on. Further on comparative analyses of natural varieties will be given, with accounts of methods by which such composition can be modified to produce artificial varieties adaptable to special uses.

12. *Gas-Coal Gases.*—Of these, so extensively employed as fuel gases throughout the world, there may be indicated four main varieties:

a. The commonest variety in present use, constituting the whole yield from coking or common gas coals in the gas retort.

b. The whole yield, under like conditions, from cannel coals.

c. The first part of such yield, furnishing a denser gas, of a much higher fuel value in the same volume than the whole yield, but much more fuliginous and requiring special burners for use as fuel.

d. The last part of such yield, furnishing a gas approximating in composition and characters to the steam gases or water gas, and applicable for fuel use with almost all burners. Though the separate collection of varieties c and d, which has no special difficulties, and their separate use for light and fuel, has long ago been strongly advised by high authorities, and is of obvious value, the gas-coal gas profession has apparently not as yet grown up to it.

13. *Rock-Oil Gases.*—Several varieties are producible, as yet but ill-defined or investigated by gas chemists. Among them gases from rock oils of our great Alleghanian oil fields, made up of the paraffine homologues; gases from those of the Caspian or Russian region, made up of olefine homologues and those of the additive benzole series; and from many other highly distinct rock oils found in other regions.

14. *Gasoline and Naphtha Vapors.*—These are extensively used in the enrichment of various gas-coal gases, water gases or steam gases, wood gases, etc., thus giving rise to a great number of varieties. They are also largely used to impart illuminating power to air, in the so-called "Gas Machines" and other like apparatus.

15. *Sulphur Vapor.*—Used to an enormous extent, as a fuel in at least one instance, that is, in the evaporation and concentration of oil of vitriol.

16. *Sulphuretted Hydrogen Gas*, which has also been used as fuel in the sulphuric acid manufacture.

17. *Phosphorus Vapor.*—Probably not yet in use for any direct fuel purpose, except as a kindler for other fuel, for which it is, of course, of almost universal application in the form of matches.

18. *Zinc Vapor.*—Burned largely to produce zinc-white.

19. *Magnesium Vapor.*—Used widely as an illuminant at least, and applicable, no doubt, directly as a fuel, if its cost be brought down.

20. *Sodium Vapor.*—Sodium is even now cheap enough to be used for producing intense lights and concentrated heats. It has, like phosphorus, been employed as a fuel kindler.

21. *Potassium Vapor.*—Potassium is yet very costly, ten times as dear as sodium, but its fuel power is doubtless higher, and if in demand for such a purpose could be made far cheaper than now. It also has been employed as a kindling agent for fuels. Both sodium and potassium vapors, moreover, are used largely for purposes of decomposition, as, for example, in isolating aluminum from its chloride by their own combustion with the chlorine of the same.

To state, in addition to the above, the changes that can be rung (so to speak), and even those that are now rung, on these individual species of materials—that is, the combinations among them, and combined methods of production, uniting their valuable qualities and adapting them to further special uses—would carry us far beyond the limits now contemplated.

The writer may possibly put in a stronger light still the extent of the subject of the fuel gases by setting forth, as below, more than twenty essential points in chemical, physical and mechanical technology, applicable to all or nearly all of the above fuel gases and vapors, and to many of their combinations, which will have to be wrought out in practice and with special reference to their widely varying qualities, before they can be regarded as completely understood, and before their complete technology can be written out.

1. The processes and apparatus for generating them.
2. Modes of confining them.
3. Modes of conveying them.

4. Modes of impelling them.
5. Apparatus for storing them.
6. Apparatus for distributing them.
7. Modes of regulating pressures.
8. The measurement of volumes and currents.
9. Condensing.
10. Purifying.
11. Enriching.
12. Odorizing.
13. Utilizing for light.
14. Utilizing for heat.
15. Utilizing for power.
16. Measuring density.
17. Measuring fuel power of.
18. Compressing.
19. Heating.
20. Superheating.
21. Determining chemical composition.
22. Detecting and preventing leakage.
23. Exhausting, etc., etc.

These, or most of them, though many men may think they ought to be simple matters, will be regarded by both men of science and men of practice as being so far from simple that they are not likely ever to become so.

THE MINING DISTRICT OF TASCO, STATE OF GUERRERO, MEXICO.

Written for the Engineering and Mining Journal by R. E. Chism, M.E.

(Concluded from page 28.)

D. Jose Vicente de Ansa was the owner in the year of grace 1792, of nearly all the mines that I have named above, and of three haciendas or silver mills, having inherited all of these goods from his uncle, who in his turn had received them by purchase or inheritance from the Bordas. In this same year Ansa made a long memorial, which, although it was addressed to the King of Spain, never got farther than the archives of the Mining Deputation of Tasco, and so nearly ended in smoke, as, indeed, it would probably have done had it got to Madrid. Tasco was even then on the downward road, and in the year 1791 the Pedegral mine, on the northeastern edge of Tasco, was shut down because it no longer paid expenses on account of the lower workings being inundated and the upper workings exhausted. The main shaft was then 610.5 feet deep, with a drift at bottom 316 feet long, and with other drifts above which extended 770 feet along the vein. Where no drainage was done the cost of getting out the ore for an output of 1,150 tons annually was between \$9.04 and \$10.30 per ton. The ore yielded between 29 and 32 ounces of silver per ton net. Under water the costs were from \$12.35 per ton to \$16.50 per ton, and this, added to the cost of treatment on the patio, \$14.85 per ton, proved unprofitable. From the above we may learn that the cost of drainage at that time, by horsewhims from the bottom of a shaft of the above depth was about \$5 per ton of ore raised from below the water line.

In the Perdón mine the cost of mining for a production of 139 tons a year was \$14 per ton for ore containing 32.5 ounces of silver per ton in the wet part of the mine. The cost of mining in the dry part is stated in the following table, which also embraces the same data with respect to other mines, and the working of their ores on the patio:

Mine.	Mining.		Metallurgy.				
	Extraction tons of 2,000 pounds.	Cost per ton.	Days on the patio.	Mercury consum'd		Costs of treatment per ton.	Net yield of silver ounces per ton.
				Pounds per ton of ore.	Ounces per ounce of silver.		
Perdon.....	11-14	\$8.20	18-22	3'6-4'4	1'8-1'76	\$11.00-\$12.00	32-40
Lumbrera.....	6-7	5.90	12-15	3'0-3'6	1'5-1'65	11.00-13.00	32-35
S. Antonio.....	45-50	1.65	25-30	2'2-2'4	1'9-2'02	8.00-8.80	18-19
Compana.....	45-53	5.00	25-32	2'0-2'4	1'33-1'42	9.60-10.00	24-27
Alchuleta.....	90-101	4.60	14-16	3'2-4'0	1'6	10.00-12.00	32-40
Huerta.....	18-23	4.20	12-14	2'4-2'6	2'0	11.00-12.00	19-21

It will be noted by an inspection of the table and a comparison of the estimated cost of mining in Tasco at the present day, given above, that the cost of mining in 1790 was somewhat less than at the present day. In all probability this was due to the low cost of labor at that time. The Ansa manuscript does not mention directly the cost of labor at that time, because all of his work was done then, as now, by contract; but from other indications which he gives I suppose that the current wages for a good miner were about 50 cents a day or even less. A common laborer or ore carrier would earn about one-half that amount. In contradiction to this it may be mentioned that drifting, such as would now cost (with dynamite and steel tools), say, \$10 a foot, would then have cost about \$18 a foot, owing to the greater cost of black powder and iron. The drills then were of iron, not always even tipped with steel. Powder was a government monopoly, and is certain to have been of the poorest quality, though it cost 51 cents a pound.

At present there is only one hacienda, or silver mill, in operation in Tasco. The owner of this is D. Pedro Flores, who is an enthusiastic metallurgist, and has improved the patio process to the highest point which it seems to be capable of reaching. Señor Flores does not own any mine, but buys some 150 cargas (22½ tons) a week from the buscones, or ore seekers. The average value of this ore is stated to be 105.6 ounces of silver per ton. The average composition of the ore is, say, 15 per cent

of galena, 12 per cent of zinc blende, and 10 per cent of iron pyrites, the rest being a quartz and lime gangue. This ore is almost impossible to smelt by itself, and it would seem that it would be under any circumstances a hard ore to amalgamate.

When the ore is delivered to the hacienda it is about egg size. The first thing done with it is to pass it through a stamp mill made in the old Spanish fashion, with wooden stamps with iron heads. There are twelve stamps in a battery, each stamp weighing some 350 pounds. A battery of twelve stamps and two arrastras besides are run by an overshot water wheel some 29 feet in diameter, with a two-foot face. Each stamp has a drop of varying height, according to the wear of the shoe, but probably the average drop will be at least 24 inches. The number of blows is twenty-three a minute. The battery will grind from six to eight tons of ore a day through a No. 40 screen.

The ore goes from the stamps in hand barrows to a reverberatory furnace of the usual type with a fire-box at one end and a chimney some 12 feet high at the other, with a hearth between. The hearth is twelve feet wide, and of about the same length, with a charging hopper above and a discharging and rabbling door at the side. The capacity of this furnace with an ordinary ore is about 20 tons in twenty-four hours. No salt is used, and the charge of a half ton is finished in about half an hour. After roasting the ore is allowed to lie for a day or two in a heap, and is then spread on the patio after regrinding if necessary. On the patio the ore is mixed with a proper amount of water, with from 4 to 10 per cent. of salt, from ½ to 2 per cent. of sulphate of copper and enough of mercury to combine with the silver in the ore. It undergoes one or two treadings by mules, and the operation is finished in, on the average, five days. Some *tortas* (heaps or literally "cakes" of pulp) are done in three days and the longest time ever taken is eight days. These times are remarkably short for the patio process, as every one who is familiar with it will admit, and are especially in contrast with the time occupied for the same ores in 1790, as set forth in the above table from the Ansa manuscript. The old workers roasted their ores also, yet the minimum time on the patio was ten days. Señor Flores gives no explanation of this difference in time except that he is very careful to assay his *tortas* before treatment, and to make a liberal use of chemicals.

Señor Flores claims that in some cases he saves as high as 92 per cent of the silver in the ores; the average saving is said to be 88 per cent. The loss of mercury when greatest is 1.5 ounces per ounce of silver, and generally not much over ounce for ounce. This again is a great contrast with the figures of the table where the minimum loss is 1.5 ounces of mercury per ounce of silver up to 2 ounces for the same quantity.

The residues of the patio are said not to contain anything that will repay further treatment, and that this is the case seems to be proven by the fact that there are no poor people washing the residues after they leave the hacienda. In Pachuca the tailing dumps are actively exploited, and furnish a living to many persons.

The cost of the treatment in Señor Flores' hacienda is from \$14.85 to \$16.50 per ton, divided about as follows:

Crushing with stamps, \$1.06 per ton of ore; roasting, 80 cents; labor and horses, \$2; washing *torta*, 20 cents; salt, quicksilver and sulphate, \$12.44; total, \$16.50.

The cost of treatment in 1790 was between \$8.60 and \$13 per ton, which is less than at present, but then Ansa worked on a larger scale, in three haciendas, and probably did not save so much of his silver as the present workers. Then there is a difference in the value of the dollar in favor of the workers. This matter I will consider farther on.

If we take ore, giving 31 ounces net, which is the average value of that treated by Ansa, there is little or no profit on it in Tasco to-day as the mines are now worked, and with the patio process of treatment. What could be done with it in 1790 will appear by the following table:

COST OF PRODUCING AN OUNCE OF SILVER IN 1790.

Materials.	Price.	Per ounce of silver.	Per ton of ore (approx.).
Quicksilver.....	79c. lb.	\$0.05	\$1.50
Magistral.....	3c. lb.	0.07	2.17
Salt.....	\$39.72 ton.	0.07	2.17
Iron.....	15c. lb.	0.03	0.93
Steel.....	19c. lb.	0.002	0.06
Powder.....	81c. lb.	0.04	1.24
General expenses in office.....		0.04	1.24
Labor, drainage, etc., in mines.....		0.45	13.95
Labor, etc., in hacienda.....		0.16	4.96
Duties, exchange and commissions.....		0.09	2.79
Total expenses.....		\$1.002	\$31.06
Product sold for.....		1.087	33.70
Profit.....		0.085	2.64
Number of ounces produced.....		196,080	
Number of tons worked (approx.).....		6,324	

Total for the whole year's operations, 1790, expenditures.....\$197,619.05

Total for the whole year's operations, 1790, value of product.....213,121.50

Total for the whole year's operations, 1790, profit.....15,502.44, or \$0.079 per ounce.\*

\* This is not exactly the same as the profit in the table on account of the difference in terminal decimals of the various items.

The above values are given in the coin of the period which was worth at least 37 per cent more than the Mexican coin of to-day, which must be taken into account in comparing the modern and the ancient accounts.

Taking all of this into account, it will be seen that the old Spaniards did really work a good deal cheaper than the moderns, but that their profits were, at least at that time and in Tasco, not so great as has been supposed. The total profit, \$15,000, was not 10 per cent on the capital paid out for expenses and probably not more than 5 per cent of the capitalized value of the mines and haciendas which were owned by the operator.

PROSPECTS.

Tasco presents to-day many advantages for the investment of capital. There are many old mines which could be restored by a well-planned shaft or a properly located tunnel by which the operator could open up new ground. In the whole of my experience in this country I have seen

but few places where the mining ground is so thoroughly mineralized and the deposits so favorably situated for tunneling.

Besides this the people are good and kind, labor is cheap, the authorities favorable to the coming of foreign enterprises and, finally, Tasco has one of the most glorious climates in the world. There is only a moderate amount of rain in the rainy season and the thermometer stands between 60 and 75 degrees all the year round.

#### TAR AS A FUEL IN GAS WORKS.

In a paper recently read by Mr. J. Thomas before the Southwest of England Association of Gas Managers, it is stated that the question of firing retort benches with tar instead of coke has engaged the attention of gas managers for many years; and various modes have been adopted for its management. The chief difficulty was in getting a constant flow of tar into the furnace, uninterrupted by stoppages caused by the regulating cock or other appliance not answering its purpose, and by the carbonizing of the tar in the delivery pipe, thus choking it up and rendering it uncertain in action. To obviate these difficulties various plans have been resorted to; but the best means used by Mr. Thomas for overcoming them he thus describes: to fix the tar-supply tank as near the furnace to be supplied as convenient, and 1 foot higher than the tar-injector inlet. A cock is screwed into the side of the tank, to which is attached a piece of compo. pipe  $\frac{3}{4}$  inch diameter 10 inches long. To this a  $\frac{1}{2}$  inch iron service pipe is connected, the other end of which is joined to the injector. By these means it is found that at the ordinary temperature of the tar well (cold weather excepted), four gallons of tar per hour are delivered in a constant stream into the furnace. If more tar is required, the piece of  $\frac{3}{4}$  inch tube must be shortened, or a larger tube substituted; and if less tar is required, it must be lengthened. The risk of stoppage in the nozzle of the injector is overcome by the steam-jet, which scatters the tar into spray, and thus keeps everything clear. Trouble being occasioned by the retorts becoming too hot, in which case on shutting off the flow of tar for a while the tar in the pipe carbonized and caused a stoppage, Mr. Thomas invented a removable plug injector, which is fitted and ground in like the plug of a cock, having inlets on either side for tar and steam. This plug injector can be removed, the tar stopped in two seconds, and refixed in a similar time. The shell of the injector is firmly bolted to the top part of the door-frame. The door is swung horizontally, having a rack in the form of a quadrant, by which it is regulated to any required height, and to admit any quantity of air. The condition of the retorts used with tar fuel is reported to have been excellent, and the experiments seem to have been satisfactory.

#### THE MINES OF BOLIVIA.

Written for the Engineering and Mining Journal by Arthur F. Wendt.

I note that the ENGINEERING AND MINING JOURNAL circulates all over the world, and no doubt many of its readers would like to know something concerning the Bolivian mines from an American engineer.

Bolivia ranks as the third largest silver-producing country in the world, and its mines produce annually from \$10,000,000 to \$12,000,000. This comparatively large production from a country without railways and fuel is, perhaps, the best index of the importance of its mines.

All the mines of Bolivia are situated at a very great elevation above the level of the sea, generally 14,000 to 15,000 feet. The mountain peaks rise above the general elevation of the valleys to a height of 18,000 or 20,000 feet. The principal producing districts in Bolivia to-day, in the order of their importance, are, first, Huanchaca; second, Colquechaca; third, Oruro, and fourth, Potosi. The last-named famous locality has a record of a production of more silver than any other place in the world. According to the royalties paid to the Crown of Spain, the production of the mountain of Potosi must have been not less than three thousand millions.

All the mines of silver now worked in Bolivia have been worked by the Spaniards, and most of them were worked by the Incas long before the advent of the Spanish conquerors. How well the Incas understood mining is evinced by the enormous quantities of silver found in their possession on the arrival of the Spaniards, and their work in the mines themselves. The writer has himself seen tunnels many hundreds of feet long cut in the solid rock by the use of chisels or knives, and as straight and perfect as could be run to-day.

Old slag heaps throughout Bolivia attest the fact that the Indians understood the smelting of galena ores, and the cupellation of the resulting lead bullion. Indeed, the only smelters of galena in Bolivia to-day are the Indians with their primitive furnaces. Lead smelting on a modern scale and with modern means has not so far been introduced in the country, and could not have been, owing to the absolute lack of all fuel. The general method of treating all silver ores in Bolivia is either by a process known as the Fondo process, or the Tina process. The latter is simply an improved Fondo, the motion of the silver ore in the process being by power instead of by hand. The Fondo process is exactly the same as invented by the old priest, Alonzo de Barba, who was a curé near Potosi. His work, published over one hundred years ago, contains a complete description of the process as used even to-day. No improvements were made on it until the Messrs. Francke introduced the Tina at Huanchaca. The principle of both the Tina and Fondo processes is the same, and consists in the action of sub-chloride of copper on the silver minerals. Decomposed minerals or pacos are treated directly in the Fondos or Tinas, but the negrillos or sulphuretted minerals are first subjected to a chloridizing roasting in small hand furnaces.

The Tina process has one very considerable advantage over the iron-pan process, and that is its ability to treat galenas. Ores with 40 per cent of lead are successfully amalgamated in Tinas.

Pulverization of the ore is generally done in Chilean mills or very primitive stamps. It is only within the last twelve months that an automatic battery has been introduced in Bolivia. The writer has also successfully introduced the White-Howell chloridizing furnace. Owing to the exceptional character of the fuel (llama dung and a resinous moss), the great elevation, and very base character of the ores, some very considerable changes had to be made in the furnace to make it a success.

A curious feature in nearly all the silver ores of Bolivia is their occurrence in conjunction with tin ores. Many silver ores, and especially those

of Potosi and Oruro, contain an appreciable percentage of tin, while most ores which are really tin ores, and contain from 30 per cent and upward of metallic tin, have a notable content of silver.

The export of rich tin ores is now regularly carried on in Bolivia, and tin smelting on a small scale has also been introduced. With the completion of the railway now building through Bolivia, a very large percentage of the world's supply of tin may be expected to be shipped from Bolivia.

The great drawback of Bolivia to-day is its distance from lines of transportation and the inferior character of the labor. The only labor which can be had in quantity is Indian. These Indians live principally on burnt maize, or corn, and constantly chew coca leaves. Of course with such a class of food they can have no strength. Their only value is as runners, and to carry loads on their backs. Their capacity to do this equals and even exceeds the native camel of the country, the llama.

While the climate of Bolivia generally is very healthy, the great altitude is sometimes so severe on white men that they have to leave the country. People with heart disease do not survive its effects. The average white man finds it very difficult to walk a mile in the rarified atmosphere of Bolivia, but the native Indian will trot alongside of a mule for many leagues without any apparent effort. In a large measure this is due to their great depth of chest. The children when born have this very deep chest, and look quiet different from any children born at the level of the sea. In the course of ages the law of the survival of the fittest has expanded the lungs of the inhabitants and especially adapted them for this thin air. They can walk and run as rapidly at these elevations as human beings born at the level of the sea can in their homes.

The peculiarity of the climate and absence of transportation account in part for the unsuccessful attempts to obtain foreign labor in Bolivia. Of ten workmen sent to the country, not over two or three will find the atmosphere and life congenial, and few care to stay, even though the wages are high. Notwithstanding all these drawbacks, however, the Antofagasta railroad now entering into Bolivia will certainly open out the country.

This railway has now climbed the Andes, and in a few months will be opened to a point near the Huanchaca mines, on the great Plateau of Bolivia.

With the possibility of obtaining fuel, many of the silver and tin and other mines will become valuable, and a considerable increase in the production of these metals may be looked for.

**Cooking by Electricity.**—The Hotel Bernina, at Samaden, has for some time been lighted with electricity, power being supplied by a waterfall. As during the day this power is not required for lighting, and is therefore running to waste, the proprietor of the hotel has hit upon the idea of utilizing the current for cooking when it is not required for lighting, and an experimental cooking apparatus has been constructed. This contains German silver resistance coils, which are brought to a red heat by the current, and it has been found possible to perform all the ordinary cooking operations in a range fitted with a series of such coils.

**Electrical Engineering at Ann Arbor.**—The board of regents of the University of Michigan (Ann Arbor) have authorized a course of study in the university leading to the degree of Bachelor of Science in Electrical Engineering. This course will be parallel with those in civil, mechanical and mining engineering, with the same requirements for admission. In addition to special electrical courses, laboratory work, etc., complete tests of central electric light and power stations will be undertaken, and students will be made acquainted with the best practice in electrical manufacturing and engineering by visits to places where such enterprises may be seen on a large scale.

**Revenue of Victoria, Australia.**—The revenue of Victoria for the year ending June 30th amounted to £8,674,000, being an increase, as compared with the previous year, of £1,067,000, and an excess over the estimates of £882,000. The customs returns show an increase of £527,000, which includes an increase of £53,000 in the revenue from the spirit duty and of £36,000 from the tobacco duty. The excise returns show an increase of £110,000, including an increase of £85,000 in the revenue from the tax on the estates of deceased persons. The territorial receipts show a decrease of £40,000. The railway revenue amounted to £3,105,000, showing an increase of £363,000 as compared with last year, and being £204,000 in excess of the treasurer's estimate. Stamps also show an increase of £87,000.

**Waterproofing Paper.**—A patent has been taken out in England for a process intended to render paper impervious to the action of acids, water, air, etc. The process is as follows: A bath of bisulphide of carbon and gutta percha is first prepared, sufficient bisulphide of carbon being used to dissolve the gutta percha and form a solution. The paper is then immersed in this solution and left therein for twelve hours or more. The material is then removed and allowed to dry for two hours, after which it is pressed so as to cause the gutta percha to form a solid coat upon the material. After being subjected to pressure the material is again allowed to dry for twenty-two hours, and the entire process is again repeated. The material is then ready for use.—*The Paper Trade Journal.*

**Steel Houses.**—A very favorable account is given in the French papers of the new system of building houses of steel plates, introduced some time ago by M. Danly, manager of the Société des Forges de Chateaufort, who has satisfactorily ascertained that corrugated sheets, of no more than a millimeter in thickness, are sufficiently strong for building houses several stories high, and the material used allows of quite a variety of architectural ornamentation. The plates thus employed are of the finest quality, and, as they are galvanized after they have been cut to the sizes and shapes required, no portion is left exposed to the atmosphere. It is asserted that houses constructed in this manner are very sanitary, and that the necessary ventilating and heating arrangements can readily be carried out.

**Electric Railway in Des Moines, Iowa.**—A correspondent at Des Moines, Iowa, says: There was a horse-car road equipped with new cars and fine horses, but the people would not ride. They preferred to walk rather than drag along at a slow pace over the heavy grades of the city. The road did not pay expenses. The system was changed to the



Thomson-Houston electric plan, and cars are now running on a track nearly five miles in length, with several branches, loaded to their full capacity, making six or eight miles an hour, up and down 10 per cent grades. On one of the branches the other day there were nearly 100 people on a car, the only connection between it and the power-house, three miles distant, being a No. 2 copper wire up in the air. That car with that load ran six miles an hour up 10 per cent grades, stopping and starting at any required point. The company has had no repairs to make.

**New Bridge at N w London, Conn.**—The great double-track steel bridge at New London, Conn., over the Thames River, will be opened for traffic next month, doing away with ferry transit. There are four spans to the bridge, extending over a distance of 460 feet on either side of the river. The great swing draw, which is said to exceed in size any ever built, is now being completed. It is 502 feet in length, with a clear waterway of 225 feet on either side of the center pier when thrown open. The spans of the draw are the most prominent feature of the work. The draw weighs about 2,400,000 pounds, and yet it is adjusted so nicely as to admit of its being turned in either direction and to make a complete revolution. It will sustain a live weight of 3,000 pounds per foot of track. The superstructure of the bridge is wholly of steel, every piece of which has been tested. It is 1,422 feet long. The foundations for the central pier of the bridge were successfully laid under a combined depth of mud and water of 130 feet.

**Early History of the Saw.**—Saws have been discovered in Germany and Denmark which belonged to the bronze age. The metal of which they were composed was cast into a thin sheet, and serrated by breaking the edge. Equally interesting discoveries have been made in America. It has been found that saws made of obsidian, which is a kind of glass produced by volcanoes, were used during the stone age in Mexico, and saws and knives of the same material have been found in the alluvial deposits of New Jersey. The Phoenicians are amongst the earliest nations which are supposed to have used the saw. The scholar is not surprised to find a very pretty story accounting for the discovery of the saw in Grecian mythology. Here the inventor is said to have found the jaw-bone of a snake, which he imitated by jaggings an iron plate. The lacustrine and other early inhabitants of Europe are credited with having made saws of flint, and the natives of the West Indian islands had saws made of notched shells.

**McMurtrie Stone.**—This stone, the process for making which is patented, consists essentially of artificial Portland stone, in the pores of which are formed compounds of alumina and the fatty acids by the double decomposition of alum and a potash soap. These compounds are insoluble in water, are not acted upon by the carbonic acid of the air, and add considerably to the early strength of the stone and somewhat to its ultimate strength. The peculiar merit of this stone is that its power of absorbing water is decreased by the use of the alum and the soap. All mortars and most of the artificial stones absorb water freely, porous mortar from 50 to 60 per cent, and consequently they disintegrate rapidly under the action of frost. The absorbed water also dissolves the salts of magnesia, lime, soda and potash (of all of which there is always more or less in cement), and on evaporating leaves a white efflorescence on the surface, which injures the appearance of the wall. For these reasons many of the ordinary artificial stones are in disrepute for architectural purposes. The absorptive power of the McMurtrie stone is stated in *Stone* to be about twice that of granite, about equal to that of limestone, and about one-tenth or less of the best sand-stones. It has been used in Washington, D. C., to a limited extent, the window trimmings of the National Museum and also the fronts of a few stores and dwellings being of this stone.

**National Importance of Coal.**—The vital importance of coal to a nation, both politically and industrially, was well shown in the events which followed the recent strike of colliers in Germany, writes Mr. Geo. G. André in the *Colliery Guardian*. Within a week of the stoppage of the pits, half the iron-works in the country were running short time, and other manufacturing industries were in difficulties for want of fuel. But what caused consternation in high government circles and led to the prompt and energetic interference of Prince Bismarck and the Emperor was the prospect of the whole railway system being paralyzed within a month of the cessation of the output. The extreme gravity of this danger in the case of war rendered it necessary to send back the men to the pits at any cost, and this it was above all else that induced the government to deal so sharply with the colliery owners. To prevent a recurrence of this difficulty, orders have been given to increase the railway stores of coal in hand tenfold, and to maintain henceforward a much larger quantity at the wharves than there has been in the past.

Manufacturers have, as pointed out in a former note, resolved to take, for their protection in the future, similar measures to those adopted by the state railway authorities. That is, they are determined to hold larger stocks of coal in hand. The buying, especially on the part of the railway authorities, will doubtless be effected gradually, so as not to disturb the market.

The German government, besides providing against the inconvenience and danger of a sudden interruption of the output of coal, by increasing tenfold the stores of railway coal, are seeking to prevent the recurrence of a general strike by establishing some kind of board of conciliation to settle disputes between masters and men.

**Cleaning Metal and Stonework.**—During the year 1886 the masonry and ironwork of the Madrid and Baudin bridges at Paris, says *Engineering*, were thoroughly cleaned by the process of M. de Liebhaber. These processes, chemical in their nature, were at first applied to the cleaning of limestones, but in these bridges materials of a different nature were dealt with. The surfaces to be cleansed are submitted to the action of a jet of mixed (dilute) hydrochloric and sulphuric acids, and left for two or three hours, when they are brushed, and finally washed with a water jet. In the case of limestone, the hydrochloric acid unites with the calcium, forming chloride of lime, which is then decomposed by the sulphuric acid, forming a calcium sulphate, this being precipitated on the face of the stone, and containing all the impurities, which are then removed by the action of the brush and water-jet. In many

cases this treatment will not succeed unless the stone is previously prepared, as the masonry becomes coated with a deposit of impurities contained in the atmosphere, which prevents the acids reaching the stones. In this case, before applying the acids, the stone is covered with a paste, consisting of a mixture of carbonate of soda and calcium hydrate, which is called "toluene." It is spread over the masonry to a thickness of from  $\frac{1}{2}$  to 1 mm., and left there for three-quarters of an hour to an hour, when the excess is washed down and brushed off, and the acids applied as described. In cleaning ironwork the "toluene" alone is used; it is spread over the work either with a trowel or brush, and in the course of an hour or so will have united with all the oil of the paint, leaving the red lead on the work in the form of a powder, which can be easily washed off with a jet of water. In cleansing brick the work is first painted with a solution of ammonium fluoride, and this immediately afterward is treated with a jet of concentrated sulphuric acid, which liberates hydrofluoric acid, and this attacks the silicates, depriving them of their silica. The whole surface is afterward thoroughly washed with water.

BOOKS RECEIVED.

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

*Elements of the Art of War.* Prepared for the use of the cadets of the United States Military Academy. By James Mercur, Prof. of Civil and Military Engineering at the United States Military Academy, West Point, N. Y. Published by John Wiley & Sons, New York, 1889. Second edition, revised and corrected. Pages 302 and index. Illustrated. Price \$4.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

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

PATENTS GRANTED JULY 16TH, 1889.

- 406,868. Process of Refining Fumes. Frank L. Bartlett, Portland, Me.
- 406,869. Process of Manufacturing Pigments. Frank L. Bartlett, Portland, Me.
- 406,870. Process of Smelting Ores. Frank L. Bartlett, Portland, Me.
- 406,871. Apparatus for the Manufacture of Pigment. Frank L. Bartlett, Portland, Me.
- 406,874. Electric Motor. John Buckley, Boston, Mass.
- 406,887. Welding Compound. William H. Cutbirth and Jacob Summers, Hollandsburg, Ind.
- 406,890. Apparatus for Railway Systems. Mark W. Dewey, Syracuse, N. Y., Assignor to the Dewey Corporation, same place.
- 406,898. Compressed Air and Steam Apparatus for Sinking Wells. Hervey K. Goodrich, Sherman, Tex.
- 406,922. Electric Motor. George W. Mansfield, Cleveland, O., Assignor to Matthew H. Robinson and Orlando A. Foster, Boston, Mass.
- 406,927. Method of Constructing Lead-Lined Converters. John Merriman, Saugerties, N. Y.
- 406,944. Apparatus for Manufacturing Railroad Rails. Edwin Norton and John G. Hodgson, Maywood, Assignors to said Norton and Oliver W. Norton, Chicago, Ill.
- 406,945. Apparatus for Making Sheet Metal. Edwin Norton and John G. Hodgson, Maywood, Assignors to said Norton and Oliver W. Norton, Chicago, Ill.
- 406,946. Manufacture of Metal Bars or Rails. Edwin Norton and John G. Hodgson, Maywood, Assignors to said Norton and Oliver W. Norton, Chicago, Ill.
- 406,947. Apparatus for Rolling Sheet Metal from Fluid Metal. Edwin Norton and John G. Hodgson, Maywood, Assignors to said Norton and Oliver W. Norton, Chicago, Ill.
- 406,964. Coupling for Hose, Pipes, etc. George A. Stedman, New York, N. Y., and David R. Stedman, Elizabeth, N. J.
- 406,984. Tire Bender. Isaac L. Anwerter, Columbia, Pa.
- 406,986. Coke Oven. Theodor Bauer, Munich, Bavaria, Germany.
- 406,992. Pipe Bender. Edward L. Burgoon, Los Angeles, Cal.
- 407,000. Reducing Stack. Charles J. Eames, New York, N. Y.
- 407,002. Furnace Grate. Otto P. Eiterich and G. Otto Eiterich, Newark, N. J., Assignors of one-third to Clements Heitemeyer, same place.
- 407,007. Apparatus for Utilizing the Force of Water Falls. Silas H. Hamilton, Alexandria, Va., Assignor to the Niagara Hydraulic Electric Company, Alexandria, Va.
- 407,028. Tool for Drilling Wells. Hiram H. McLane, San Antonio, Tex.
- 407,038. Mode of Preparing Pipes or Tubes for Coupling. James Robertson, Birmingham, County of Warwick, England.
- 407,044. Hydraulic Dredging Machine. Julius H. von Schmitt, San Francisco, Cal.
- 407,065. Injector Oil Burner. William N. Edson, Chicago, Ill., Assignor of one-half to Simon Frankenstein, same place.
- 407,085. Power-Transmitting Device. William Main, Brooklyn, N. Y.
- 407,104. Heating and Purifying Feed-Water for Steam Boilers. Virgil H. McConnell, Buffalo, N. Y.
- 407,117. Process of Converting Crude Iron into Malleable Iron or Steel. Gustave L. Robert, Stenay, France, Assignor, by mesne assignments, to the Brookwaller Steel and Iron Company, Jersey City, N. J.
- 407,123. Water Motor. Louis P. Santy, Clements, Kan.
- 407,156. Manufacture of Steel. Thomas S. Bailr, Jr., Pittsburg, Pa.
- 407,166. Retort for Distilling Wood and Making Charcoal. Franklin S. Clark, Wilmington, N. C.
- 407,176. Wire-Rod Rolling Mill. Fred H. Daniels, Worcester, Mass.
- 407,177. Rolling Mill Plant. Fred H. Daniels, Worcester, Mass.
- 407,182. Process of Refining Oils. Jesse A. Dubbs, Allegheny, Pa.
- 407,184. Single Acting Compound Engine. John H. Eickershoff, Cincinnati, Ohio, Assignor to the Triumph Compound Engine Company, same place.
- 407,202. Apparatus for Drilling and Pumping Oil or other Wells. Michael Harold, Lima, Ohio.
- 407,213. Water Motor. Ferdinand Johnson, New London, Pa.
- 407,219. Clay Grinding Machine. David Kennedy, Jr., Erie, Pa., Assignor of one-half to Erastus B. Lipton, same place.
- 407,222. Apparatus for Coating Metals with Zinc or other Metals. Friedrich W. Koffler, Unter St. Veit, near Vienna, Assignor of one-half to Adalmar Breden, Vienna, Austria-Hungary.
- 407,234. Motor Engine Worked by the Combustion of Spray of Petroleum. Nicolas A. Otto, Cologne, Prussia, Assignor to the Gas-Motoren-Fabrik-Deutz, Deutz-on-the-Rhine, Germany.
- 407,257. Rock Drill Support. Henry C. Sergeant, New York, N. Y.
- 407,258. Direct Acting Engine. Henry C. Sergeant, New York, N. Y.
- 407,272. Electric Motor. Leonidas G. Wooler, Grand Rapids, Mich.
- 407,277. Metal Coiling Apparatus. Frank Bracken, Pittsburg, Pa., Assignor to Henry Roberts, same place.
- 407,285. Combined Square, Level, Protractor etc. Christian Ensminger, Albany, N. Y., Assignor, by mesne assignments, of one-half to Cortland S. Babcock, same place.
- 407,287. Smoke and Gas Consuming Furnace. Albert Fickett, Rochester, N. Y., Assignor of one-half to Thaddeus W. Hulett, same place.
- 407,289. Gas Furnace. Robert S. Franz, Glenshaw, Pa.
- 407,301. Rail Joint. Milton C. Niles, Chicago, Ill.
- 407,306. Apparatus for Skelping or Tube Welding. James A. Simpson, McKeesport, Pa.

REISSUES<sup>2</sup>

- 11,012. Magnetic Separator. Gurdon Conkling, Glen Falls, N. Y.

## PERSONALS.

Mr. Boetius H. Sullivan, of Dakota, has been appointed Surveyor-General of Dakota.

Mr. E. R. Warren, of Crested Butte, Colo., has been appointed county surveyor of Gunnison County.

The resignation of Mr. John Scott from the presidency of the Colorado Midland Railroad is received with universal regret. His recent short administration greatly benefited the company.

Mr. Charles A. Stetefeldt, the well known mining engineer and metallurgist, who has had his office in New York for several years, has decided to return to San Francisco, and will leave for that place next week.

Mr. Beal Shirkey, late of the Low Moor Mines, Virginia, has been appointed superintendent, and will prepare at once to take charge and commence active work. Although there is a small furnace on the property, it will not be put in blast.

Mr. John E. Burton, known as one of the Iron Kings of the Gogebic District in the Northwest, during the two years ago, has made an assignment; liabilities are said to be \$825,000. The Central Trust Company of New York has the largest claim, \$350,000.

Mr. W. L. Pierce, secretary of the Lidgerwood Manufacturing Company, of New York, sailed for Europe, Saturday July 6th for a two months' trip on the continent. Mr. Pierce will combine business with pleasure while abroad, and visit the Paris Exposition before his return.

The Knights of Labor are preparing for their fifth annual convention. It will be held in Atlanta, Ga., on the second Tuesday in November, according to the orders which have just been sent out from Chicago. It is stated that there are not more than 150,000 Knights now, as against 1,000,000 three years ago.

Commodore Slavin, President of the American Contracting and Dredging Company, who have already executed some large contracts on the Panama Canal, sailed for Paris on Wednesday to arrange with the new Panama Canal Company for the completion of the canal.

The International Labor Congress, which is in session at Paris, France this week passed a series of resolutions. Among other things the resolutions demand a universal maximum of eight hours for a day's labor, one holiday a week, and unconditional the suppression of all labor by children under fourteen years of age.

Mr. Clifford J. Ellis, who has had charge of the Chicago office of the Cambria Iron Company for the past three years, has been promoted to the assistant treasurer of the company. He will remove to Johnstown, Pa., and shortly assume his new duties. Mr. George N. Ismon, who has filled the position of salesman from the Chicago office, will succeed Mr. Ellis as agent for the company from the 15th inst.

Mr. William A. Richards of Wyoming has been appointed Surveyor-General of Wyoming.

The following Registers of Land Offices have been appointed: Charles H. Coruell of Nebraska, at Valentine, Neb.; Edward P. Champlin of Wyoming, at Cheyenne, Wyo.; Martin J. Wright of California, at Visalia, Cal.; John A. McBeth of Colorado, at Denver, Col.

Among the recently elected members to the Society of Chemical Industry we notice the names of the following Americans: Fred P. Dewey, curator of the metallurgical department of the U. S. National Museum, Washington, D. C.; Joseph Glatz, of the Riverside Chemical Works, Brooklyn; Hermann M. Schroeter, Philadelphia, and H. N. and M. Gates, of the Cowles Electric Smelting and Aluminium Company, Lockport, N. Y.

The celebration of the Fourth of July at New Almaden, of which we find an account in the *San José Mercury*, developed some features which it is a pleasure to note, as showing the good feeling which a wisely managed mining company can inspire among its employes. The exercises, consisting of addresses, a barbecue, athletic games, etc., were participated in by the officers and hands of the Quicksilver Mining Company and citizens. The speeches brought out in a most agreeable way the harmonious sentiment referred to, and the celebration was altogether a great success. Mr. J. B. Randol, the able manager of the company, is to be congratulated on the cordial relations existing between the employes and the organization, which are doubtless due to a recognition of the solicitude which the company has long shown for the welfare of its people.

## OBITUARY.

Col. Joseph C. Tiffany died at Deming, New Mexico, on the 15th inst., aged 62 years. Mr. Tiffany was well known throughout New Mexico, Arizona, and Colorado as a man of great activity and enterprise. He invented a gas machine which was used largely in the different navy yards.

The death is reported of Charles H. Hollman, of the National Fish Commission, in the swamps of Southern Georgia, where he was engaged in scientific work for the government. He was a recent graduate of the

Indiana State University, and had acquired a national reputation as a naturalist.

Col. Charles H. Locher died suddenly at Balcony Falls, in Rockbridge County, Va., on the 14th inst., of heart disease. Col. Locher founded the famous James River Cement Works, at Balcony Falls, many years ago, was one of the heavy contractors for building the James River and Kanawha Canal, and at one time a prominent merchant of Baltimore. During the war he superintended the iron works of the Confederacy at Lynchburg.

Mr. George Sherman, an old retired hardware merchant who stood very high in business circles, died in this city on the 15th inst., at the residence of his son, E. G. Sherman, at 67 West Seventy-third street. Mr. Sherman has been in failing health for several weeks, and death was finally caused by dysentery. The funeral will take place this afternoon at the Transfiguration Chapel. Mr. Sherman for a long time was engaged in the hardware business in New Haven, with a branch store in New York. After disposing of his business he removed to this city, where he became connected with the Empire Stone-Dressing Company. He was also at one time Secretary of the American Coal Company.

## INDUSTRIAL NOTES.

The strike at the Homestead plant of Carnegie, Phipps & Co. was definitely settled on the 14th inst., and work will be resumed.

The machine shop and foundry at Glen Rock, Pa., owned by E. R. Miller, George W. Heindel, J. G. Bortner and Wm. Foust, was destroyed by fire on the 18th inst.

The nailers of the Brooke Iron Company at Birdsborough, Pa., held a meeting this week, and decided not to accept the reduction proposed by the company two weeks ago. The nail factory is not running, and the firm's sheet mill has shut down in consequence.

Mr. W. H. Peters, of Ironton, O., our correspondent advises us, has contracted to move a foundry from that place to Iron Gate, Va., expecting to take advantage of the close proximity of the large blast furnaces in that neighborhood making strong neutral irons.

Fifty men struck at the boiler works of the Dickson Manufacturing Company at Scranton, Pa., on the 16th inst. Two months ago a reduction of 10 per cent was made in the pay. A week ago the men gave notice that unless the reduction was restored they would quit work. The reduction was not restored.

The World Lubricating Company has filed articles of incorporation at Albany, N. Y. The object of the company is the manufacture and sale of lubricants. The capital stock is \$50,000, and the incorporators are Franklin E. Howard, of Buffalo; Charles H. Phillips, of Cassadaga, and Charles Clute, of Dunkirk.

Messrs. Benjamin Atha & Co. are erecting a Boulton ingot-casting apparatus at their steel works in Newark, N. J. Sir George Elliott, who was interested with Cyrus W. Field in laying the first Atlantic cable, has purchased a half-interest in the Boulton patents for Great Britain, and he now has machines building for Vickers & Kemp and for Jessup.

The Columbus and Hocking Coal and Iron Company's Bessie furnace, New Straitsville, Ohio, closed down on the 10th inst. for much needed repairs. It will be closed for at least three months. Every furnace in the Hocking Valley is now closed, this being the last. It was kept running on account of the fine grade of iron it was making.

THE NEW CROTON AQUEDUCT.—It is now announced that it will not be possible to let on water in the new Croton aqueduct before next spring. Extensive repairs have been made necessary by previous bad work. Meanwhile, the scarcity of water and low pressure have caused much inconvenience to the people of New York City. Even when the new aqueduct is put in use there will be none too much water for the city until sufficient storage reservoirs are provided.

President Corbin, of the Philadelphia & Reading Railroad, which recently purchased the Reading Iron Works, as mentioned in our issue of July 6th, about a week ago issued his notification to the employes of the Iron Works, that they would be only re-employed upon condition that they obligated themselves not to belong to labor organizations or become intoxicated while on or off duty. Up to the 15th inst., about 1,200 signed the blank forms, stipulating that they will observe these conditions, and up to the specified time it is expected enough men will sign to enable the company to start in all departments. It is the intention of the company to manufacture a great deal of the structural iron work for its Philadelphia terminal at these works.

The Ball Electric Light Company seem to be holding its own in the way of sales. It reports that it has recently sold 1,172 arc lights, and states that it is far behind the present orders, and that it is the intention to immediately increase the manufacturing facilities. The company will issue a new catalogue shortly, which may be had upon application at the office, No. 18 Cortlandt street, New York. The catalogue will contain, in addition to ordinary description of the dy-

namous and lamps and testimonials, from some of the leading parties using it, very valuable instructions for the care and operation of electric light dynamos. These books will be of interest to engineers and electricians in charge of any and all systems.

Work is in progress at the A. & P. Roberts & Co.'s Pencoyd Iron Works, Philadelphia, Pa., on the superstructure of the new bridge which is to cross the Schuylkill at the falls, to connect the Philadelphia & Reading Railroad's main line with the Port Richmond branch, to accommodate the Baltimore & Ohio through trains to New York. The bridge is to be of iron, resting on stone piers and approaches, and will be what is known as a plate-girder bridge. Beginning at the western terminus will be a span 93 feet in length, extending from the junction with the main line over the West Park Drive to a pier near the river bank. The other spans will be in length as follows: One span 60 feet and six spans each 87 feet; the east end span will be of stone, 80 feet in length, with an arch sprung across the East Park Drive. The west-end span will be covered with corrugated iron, in order to conceal the trains, so that the horses below may not be frightened, and the bottom covered in to prevent sparks or grease from falling on the drive. The bridge will have a curve in its entire length of a fraction over 6 degrees, and will have two tracks.

The sale of the Otis Iron and Steel Company, of Cleveland, Ohio, to an English syndicate is verified by the officers of the company. Negotiations leading up to the sale have been going on for several months past, and President Charles A. Otis and Treasurer Thomas Jopling visited London last February. The price paid for the works is \$4,500,000. The deal does not include the American Works of Cleveland, nor the Solid Steel Company, of Alliance, two other concerns owned by Mr. Otis and his associates. The securities of the new company will consist of \$1,500,000 of 6 per cent debenture bonds, \$1,500,000 of 8 per cent preferred shares, and \$1,500,000 common shares. The affairs of the company for the present be conducted by the old management. The Otis Iron and Steel Company was organized early in 1873. On July 5th, 1873, the ground was broken, and the first steel was produced in October, 1874. The capital stock at that time was \$300,000, and operations were begun on a comparatively small scale. The works became more extensive with each succeeding year until they had the largest plant in America for the production of steel boiler plates. The company confine their operations to the manufacture of boiler plate and axles. A new forge has just been completed, and in another month they will have in operation the largest axle-making plant in the country. The Otis Works are now equipped with two Bessemer converters and a Siemens-Martins plant.

The Anglo-Pacific Steel Company, of San Francisco, Cal., organized some time ago, but which has done nothing toward building the proposed works, has now secured a location at Vallejo, opposite Mare Island, the city having given 100 lots and more having been purchased. The land is given conditional to the works being established. A tract of 350 acres has been secured southwest of Vallejo, with a water frontage of 4,000 feet. Mr. Hammond, the projector, is reported to have stated that the company expects to begin preparations within two months, and will probably have a portion of the plant in operation by the last of the year. The first structures erected will be four main buildings, entirely of iron, 64 x 500 feet in area. The total investment, including plant and material, will amount to about \$1,000,000. The new town of Sheffield will be regularly laid out in blocks 250 x 500 feet, with avenues 60 and 70 feet in width. The company will build houses to rent to the workmen as fast as needed, and we intend to build schoolhouses, a church, a library building and other improvements for the benefit of the community. Railroad tracks running into the works and to the wharves will be built connecting with the Southern Pacific road, which runs through Vallejo.

The purpose of this company is to manufacture steel rails, steel plates, beams, shafts for vessels and other articles. The company is largely composed of the English capitalists who also control the Moss Bay Coal and Iron Company, in Washington Territory, where smelting works will be erected.

## CONTRACTING NOTES.

Manufacturers of machinery, engineers and contractors should consult our directory of "Contracts Open" on page xii. This week proposals are invited for the following new contracts: Railway Construction, Furnishing Stone for Sidewalks, Street Railway Work, Grading and Masonry, Lengthening Canal Locks, Repairing Chesapeake & Ohio Canal, Sinking Artesian Well, Iron and Steel Work.

The Gas Commissioners at New York have been awarding bids for lighting the city by electricity. The recent decision of Corporation Counsel Clark made the work very easy, and the old companies generally secured new contracts under bids greater than those of other companies, who were debarred because of not having poles and wires established along the streets to be lighted. The Brush, East River and United States companies secured the greatest number of contracts, at prices ranging from 25 to 35 cents per light. The granting of awards for lighting portions of Harlem was again laid over.

**MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.**

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column, and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

**GOODS WANTED AT HOME.**

- 68. Nickel and cobalt ores and furnace products wanted. New York.
- 69. Dynamo for lighting cotton mill. North Carolina.
- 70. Electric light plant for town. Virginia.
- 71. Electric motor to furnish power for tree felling. Michigan.
- 72. Small electric light plant. Texas.
- 73. Equipment for electrical railroad. North Carolina.
- 74. Engine, twenty H. P., either new or second hand. Mississippi.
- 75. Engine, ten H. P., with 3-inch pump and elevator. Arkansas.
- 76. Engine and pump and about 8,000 feet of pipe for irrigating orange grove.
- 77. Hoisting engine, eight or ten H. P., with boiler; double cylinders preferred. Either new or second-hand. North Carolina.
- 78. Construction and equipment of one mile of street railroad. Kentucky.
- 79. Rails and rolling stock for dummy line. Georgia.
- 80. Tee-rails and spikes. Arkansas.
- 81. Small locomotive saddle tank. Weight of locomotive is 15,000 pounds; gauge, 3 1/2 feet. Also, 25-pound rails. West Virginia.
- 82. Water-works supplies. Kentucky.
- 83. Water-works plant, including boiler, pumps, 8-inch mains, 6, 4, 1 and 1/2 inch pipes, hydrants, etc. Florida.
- 84. Ice machine, four or five tons capacity. Georgia.
- 85. Boilers and saw mill machinery. North Carolina.
- 86. Bolt cutters. Florida.
- 87. Ocre mill, of from five to ten tons daily capacity. Kentucky.
- 88. Shingle machines, double horizontal, two, to cut 150,000 shingles per day, including motive power. British Columbia.
- 89. Dredges wanted for dry and wet excavation. Georgia.
- 90. Ice machine, to make 10 to 20 tons per day. Arizona.

**AMERICAN GOODS WANTED ABROAD.**

- 22. Firm in Sydney, New South Wales, wants to take the agency for American hardware and machinery.
- 23. Parties in Sandhurst, Victoria, Australia, want to correspond with manufacturers of the following goods: Blasting and sporting powder, bellows, steel for drills, axle grease, wire and hemp rope.
- 24. Steam inspection cars; also a machine for making soap and candy cases wanted in Sydney, New South Wales.
- 25. Grease and oils wanted in Melbourne, Victoria, Australia.
- 26. Household specialties, lumber, paints, oils, saddlery and carriage hardware, Perth, West Australia.
- 27. Canned goods, in Sydney, New South Wales.
- 28. A Melbourne, Australia, house wishes to represent American manufacturers of mining and boring machinery.
- 29. Christchurch, New Zealand, parties desire to hear from manufacturers of fencing wire or fences also oils and general merchandise.
- 30. A Christchurch, New Zealand, house wants mining and general machinery.
- 31. Two houses in Sydney, New South Wales, want agencies for American manufacturers.
- 32. A firm in Hong Kong wants to correspond with manufacturers of goods saleable there.
- 33. A house in Peking, China, wants fancy articles and toys, and would like to correspond with American dealers in Chinese curios.
- 34. Parties in Trichinopoly, India, wish to correspond with American house that will buy Indian cigars.
- 35. A firm in Rangoon, Burma, wants agency for American goods.

- 36. A merchant in Ceylon wants to correspond with American manufacturers.
- 37. A correspondent in Barbadoes, West Indies, wants agencies for American goods of all kinds.
- 38. A firm in the City of Mexico wants to correspond with manufacturers of hardware, agricultural implements, etc.
- 39. Mexican house wants blasting powder and fuse.
- 40. House in Panama wants catalogues and prices of goods adapted to their market.
- 41. Two firms in British Honduras will take the agency for general American wares, particularly articles of domestic utility.
- 42. A firm in Buenos Aires, Argentine Republic, would like to hear from American manufacturers desiring to be represented there.
- 43. A mercantile house in Chili, S. A., wishes to correspond with manufacturers of agricultural and mining machinery.
- 44. The president of a railroad company in the Hawaiian Islands wants catalogues and price lists of American railway supplies.
- 45. A house in the United States of Colombia would like to establish "commercial intercourse" with American manufacturers.
- 46. Mill engine, coupled at 120 degrees, 20 pounds steam to 1 ind. H. P., guaranteed one year; 3-cylinder engine, one of 24 inches diameter, high pressure, 5-foot stroke; two of 30 inches diameter. low pressure, 1,000 ind. H. P., with 150 steam, 50 revolutions; two 24-foot fly wheels (band wheels), one being 5 feet 3 inches wide, the other 3 feet 2 inches wide. Bolivia.
- 47. Hoisting engine, maximum capacity 375 tons in 20 hours from depth 2,000 feet in load, maximum 2 tons (2 cars of 1 ton each); direct-acting compound double tandem cylinder, 18 inches high pressure, 36 inches low pressure, 48-inch stroke, cut off at 1/2; two friction drums, 4 feet diameter, 3-foot horns. Bolivia.
- 48. Eight winze hoists, eight winze pumps, air pipes, column pipes, belting, hose, etc. Bolivia.
- 49. Compound water pumping engine, to lift 150 feet high. Bolivia.
- 50. Air compressors (duplex-compound), Corliss-tandem-coupled at right angles. Two air cylinders, 20 inches diameter; high-pressure cylinder, 20 inches; low pressure, 35 inches. 48-inch stroke, with fly wheel, 20 feet diameter, weighing not over 40,000 pounds, engine to cut off up to 4.10 on high-pressure cylinder. Independent compressor and pump. Bolivia.
- 51. Boilers, six 8 feet diameter, 12 feet long by 3 feet. Corrugated flue under 1,000 H. P., with evaporation of 12 1/2 pounds water to 1 pound Welsh coal. From 120 degrees, sea level, 180 pounds pressure. Bolivia.
- 52. Six Boilers, 6 feet by 15 feet, tubular, 81 tubes. Grates, 5 feet by 6 feet. Return tubular, with cast front, complete, to evaporate 14 pounds water to the pound of coal (coal costs \$50 per ton, gold) 15,000 feet above level of the sea. Bolivia.
- 53. Exhaust fan and blowers, for dust of battery and roll, and blowers for boilers and gas producers. Bolivia.
- 54. Stamp mill, 100 stamps, 1,000 pounds each, in 10 batteries, complete. Steel cams, tappets, heads, shoes and dies, iron frames, charcoal, iron or steel motors. Bolivia.
- 55. Two 10-inch by 20-inch Blake crushers, four 6-inch by 20-inch Blake crushers, five pairs of 36-inch by 14-inch rolls, one salt dryer, revolving cylinder, 5 feet by 30 inches; four ore dryers, revolving cylinder; four ore conveyors, 50 feet long by 24 inches diameter, revolving pipe. Bolivia.
- 56. Eighteen rock drills with posts, arms, tripods, etc., complete. Bolivia.
- 57. Surface condenser, 4,000 square feet cooling surface, tinned brass tubes, independent direct acting pump. Bolivia.
- 58. Melting works—two 3 by 8 feet by 15 feet high Raschette water jacket blast furnaces, one 36-inch round furnace, 15 feet high. Complete with slag pots, movable well, two cupel water jacket furnaces, three slag roasting furnaces. Bolivia.
- 59. Roasting furnace, for chloridizing/roasting 150 tons a day (5 per cent antimony, 35 per cent sulphur).
- 60. Amalgamating pans, etc., or tins, thirty 6 feet dia., fifteen 10 foot settlers, three clean-up pans, two quicksilver pumps, two agitators, one amalgam press, retorts for 6 tons amalgam per day, line shafting and pulleys. Bolivia.
- 61. Gas producer, ten, for soft coal: each to burn 2 tons in 24 hours. Bolivia.
- 62. Mine cars—20 steel mining cars to carry 13 cubic feet; 14 inch-steel wheels and steel axles. Bolivia.
- 63. Rope, 5 by 318 flat, crucible steel. Bolivia.
- 64. Wheelbarrows. Bolivia.
- 65. Wooden houses for workmen, fifteen, each with 2 rooms, 12 feet by 18 feet, with 10 foot by 12 foot kitchen. Fifteen with 2 rooms, 13 feet by 18 feet. One boarding house, 30 feet by 60 feet; single story. Bolivia.
- 66. Office and house furniture. Bolivia.
- 67. Carts for transporting metal, with hickory wheels and iron box of a capacity of 8 to 9,000 lbs., such as are used for this purpose in Colorado and Nevada. Bolivia.
- 101. Lager Beer: will take 1,000 bbls, a month during hot season. No house wanted now represented in the Colonies. Melbourne, Australia.
- 102. Brickmaking Machinery, capacity not specified. Sydney, New South Wales.
- 103. Kerosene Oil is wanted by a house having branches throughout Australia.
- 104. Canned Foods—salmon, oysters and fruit—Melbourne, Australia.

**GENERAL MINING NEWS.**

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including July 10th, as reported by the Marquette Mining Journal, were as follows:

	Tons, 1889.	Tons, 1888.
Marquette, Marquette District....	568,136	175,089
St. Ignace, " " " " " "	19,155	46,709
Escanaba, " " " " " "	389,717	299,153
" Menominee District.....	650,949	374,536
" Gogebic District.....	105,575	73,718
Ashland, " " " " " "	339,385	308,006
Two Harbors, Vermillion District.	325,725	98,096
Total, tons.....	2,598,642	1,377,387

The Craig Mineral Railway Company is advertising for laborers to work on its line in process of construction, from Gala Water, Va., on the Richmond & Allegheny Railway to Fincastle, O. This road will open up a fine timber and ore region.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—The net earnings of this company for June are \$49,800; fixed charges, \$35,000; surplus, \$14,800.

**CALIFORNIA.**  
**AMADOR COUNTY.**

[From our Special Correspondent.]

AMADOR, July 8th.

This county now claims to lead the other California counties as a gold producer. There are 22 quartz mills in operation containing 608 stamps, two of these mills to be enlarged to contain 10 stamps additional each; and three new mills, with 130 more stamps, are in process of construction, which will make a grand total of 748 stamps, with a crushing capacity of 2,200 tons per day.

AMADOR GOLD MINE, LIMITED.—At this mine, situated about 1 1/2 miles south of Jackson, renewed activity is noticed in all directions since the London parties took hold of this great property. The finishing of the mill, tramway and hoisting works, which has been going on so long will soon be an accomplished fact; and we can reasonably hope to hear the 60-stamp mill (of which it may be said no better can be found in the county, and may be in the State), will start within the next 60 days. We are pleased to note John Minear has been retained as superintendent at the handsome salary of \$7,000 per year. He has been connected with the property from the very first, and undoubtedly knows more about the ore bodies and the best way of working them than any man the company could have selected. He has always taken a deep interest in the work of development thus far, and, if any one can make it pay, he can.

BUNKER HILL GOLD MINING COMPANY.—There has been a report that an English company was about to buy the Bunker Hill gold mine in Amador City, but so far the report has not been confirmed. We would like to see a good English company take hold of it, for we are convinced the mine could be made one of the best in the county if money was judiciously expended upon and in the mine.

HECTOR MINING COMPANY.—It is reported again that the Hector (Mahoney) mine is sold, and I think this time it is a sure go. In my last report I stated it had been sold to Ballard & Martin, and such was the report, confirmed by Superintendent H. Rease, of Ballard & Martin's New London mine, at Plymouth. It seems the Wildman Mining Company, of Sutter Creek, whose property joins the Hector on the south, had a bond on the Hector, but no one had any idea they would ever buy the mine outright. When the report got out that Ballard & Martin were after the "Mahoney" or "Hector," the Wildman people suddenly came to realize that they must have the property, and it is now reported that the sale has been made to the Wildman Company for something like \$75,000. It is to be hoped the report is true, for the people have become tired of hearing the "Mahoney is sold" or the "Mahoney is about to be started up."

KEystone.—At this mine, in Amador City, there has been a recent change in the management, but it is supposed to be only temporary. Supt. O. C. Hewitt, who has been in charge of the property for 19 years, has gone to the Springs for his health, and Mr. Mark Elliott has been appointed superintendent. Mr. Elliott is a man of ability and the property will not suffer under his management. He started the full 40 stamps on the evening of the 4th inst., and we hope he may be able to keep them running.

NORTH STAR MINING COMPANY.—At this mine, just south of the "Talisman," the work of sinking their shaft goes on. They are down about 700 feet. They will soon commence prospecting and it is hoped by all they may soon find pay ore. Thus far they have put about \$30,000 into prospecting and have no ore in sight. The company is made up of citizens of Sutter Creek who can ill afford to put much more money into that mine unless there is a good prospect of getting it back.

TALISMAN MINING COMPANY.—At the South Spring Hill mill, in Amador City, they are preparing to add 10 more stamps to their 30-stamp mill. It is understood these new stamps, together with 10 of the present 30, will belong to the Talisman Mining Company, which joins the South Spring Hill on the south. As soon as these stamps are completed we hope to see the Talisman Company go right ahead and make that old abandoned mine one of the paying mines of the county.

WILDMAN MINING COMPANY.—At the Wildman mine 10 stamps are being added to the 10-stamp mill

by Knight & Company, of Sutter Creek. It is reported this property is looking well, and we may safely believe the report when we see new stamps being added to the mill.

## NEVADA COUNTY.

**CALIFORNIAN (NEVADA COUNTY) GOLD AND SILVER EXTRACTION COMPANY, LIMITED.**—This company has been organized in London, with a capital stock of £50,000, shares £1 each, to establish Public Reduction Works for the extraction, by means of the Newbery-Vautin patents, of gold and silver from the deposits of refractory ores of Grass Valley, and other well-known mining districts; to acquire the exclusive license for working the Newbery-Vautin patents in the County of Nevada, in the State of California; and to purchase a mill site connected by a siding with the Nevada County N. G. Railroad, for the establishment of the first Chlorination Works. This mill site has been secured, having a water-pipe connection from the Grass Valley Water Company, from which water power can be obtained sufficient to work any machinery erected. The directors propose either to purchase the ores outright from the mine owners, or to charge them at the rate of \$16 per ton for treatment. There is sufficient working capital allowed to erect two more sets of four-barrel plants. A source of income is also expected from the sale of licenses.

## COLORADO.

**COLORADO GOLD AND SILVER EXTRACTION COMPANY, LIMITED.**—This company, whose works are at Denver, has ceased purchasing ores, and will hereafter devote attention to treating ore for parties who wish to determine its adaptability to chlorination treatment. The company is prepared to make working tests on any scale desired, and will erect mills for those desiring them, guaranteeing results equal to test trials. Some additional patents have been taken out by the company.

(From our Special Correspondent.)

## ASPEN, July 11th.

Just now Aspen looks dull because of the falling off in production of ores from Tourtelotte Park, but a temporary check just now will do the district more good than harm, because otherwise there is great danger of too big a boom in real estate and mines; a slight setback now is better than a big breakdown next winter.

Rust's Sampling Works are practically sold to Mr. C. E. Palmer, and it is generally understood that Mr. Horace Devereux and Mr. J. B. Wheeler are associated with him in the purchase.

Messrs. Taylor and Brunton on the 11th inst. began breaking ground on Ute Avenue, opposite the Colorado Midland Railway station, for a sampling mill about 225 by 70 feet, including ore bins. They will make a specialty of leaving a large proportion of the ores coarse enough for advantageous smelting in blast furnaces.

Arrangements are nearly completed for the driving of a deep drainage and working tunnel into Smuggler Mountain, to drain the J. C. Johnson, Chatfield, Park, Regent, and other mines. Under the Park-Regent property this would gain a vertical depth of about 1,200 feet. The company will probably be known as the Smuggler Mountain Tunnel and Tunnel Site Company.

## BOULDER COUNTY.

(From our Special Correspondent.)

## WARD, July 14.

Ward District is the scene of more life and activity than can be found in any other part of Boulder County. A demand has grown for ores running high in iron, and this district can furnish them, and furnish them free from undesirable impurities. The number of working mines is increasing, prospects are being developed into mines, new locations are being made, and prosperity seems to have dawned upon this district that has so long been kept in the background by high freights and smelting charges. Freights now are just one-half of what they were eight years ago, smelting charges are a little less than half, and mining supplies cost on an average about 60 per cent of the prices current eight years ago. Ore that could only be shipped at a loss now yields a good profit.

Stamp mills no longer take out from 20 to 30 per cent of the value in the ore, and run the rest down the creeks; but all of the mills are furnished with concentrating machinery, and the tailings are compelled to yield a large portion of their riches before they are permitted to escape.

Among the mines in active operation are the Puzzler, Gage, Niwot, Columbia, Modoc, No. 7, No. 5 East (two claims on the Columbia lode), Boston, Utica, Baltimore, Parole, Celestial Extension, Morning Star and Colorado.

The Niwot mill is running fifty stamps night and day, the Binford mill ten, and the Utica mill twenty. Mr. Hulings' mill will be refitted at once, and work on Colonel Brainard's mill will begin to-morrow. When the two last named are in operation again there will not be an idle mill in the district. In addition to the mills named, a contract to build a new twenty-five stamp mill for No. 7 and the Colorado has been let to Messrs. Hendric & Boltnoff, of Denver, and work was begun last week.

Other mills are projected, and a number of mine owners are unable to get their mill ore treated, and can realize only from their smelting ore.

Miners from other camps in the county are coming here in search of work and seem to be successful in getting it.

## CUSTER COUNTY.

**GEYSER MINING AND MILLING COMPANY.**—This is what the Silver Cliff *Rustler* has to say about this company: "The Geyser company has a force of men

at work cutting the pump and tank station at 250, framing timbers, preparing masonry for the machinery, etc. The compressor was shipped from Connecticut, on the 3d, by fast freight and a tracer is sent after it every night. It is expected in this week. Also the new boilers and a car load of machinery. The force of men will be steadily increased and lively work will soon be under way." Readers of the *ENGINEERING AND MINING JOURNAL* will recall the fact that the "Geyser" is the reorganized "Security," and the latter company was the reorganized Silver Cliff. The Security was stricken from the list of shares dealt in by the New York Consolidated Stock and Petroleum Exchange a few weeks ago.

## LAKE COUNTY.

**DINERO MINING COMPANY.**—The company is shipping low-grade ore to its concentrating mill, which has been running for a short time past on the accumulation of low grade ore of the mine taken out in the course of development work. It has been nearly worked up, however, and the mill will stop operations.

## OURAY COUNTY.

**RUBY TRUST MINING AND MILLING COMPANY.**—This company, which was incorporated in St. Louis for \$8,000,000, it is reported, has reverted to the original owners, owing to a failure to make the final payment. The owners were to receive \$35,000, says the *Denver Mining Industry*, though the price at which the mine was floated in St. Louis is said to have been \$125,000.

## PITKIN COUNTY.

The mining case of John C. Johnston against the Standard Mining Company and others came up for rehearing before Judge Hallett, in the United States Circuit Court at Denver, on the 8th inst. He rules in effect that to have property rights in a mine a contestant must evince an interest during the period of development as well as the period of pay.

**BONNYBEL VS. COMPROMISE MINING COMPANY.**—In the United States Circuit Court at Denver on the 8th inst., Judge Hallett has refused an injunction on the application of the owners of the Bonnybel against the Compromise Mining Company. The motion for injunction in the case of Bates against the Compromise Mining Company and others is founded mainly upon the verdict and judgment entered at the last term in the case of Hymen against Eames *et al.*

Judge Hallett orders that, upon the testimony as it exists in the record, it is impossible to allow an injunction—at least to the extent which complainant demands. It may be reasonable to make an order requiring defendants to show the gross proceeds of ore taken from the ground in dispute—monthly statements to that effect—in order to give complainant some data to go upon in case he shall ultimately succeed in his litigation.

**PITKIN COUNTY RAILROAD COMPANY.**—This company has been organized for the purpose of building a narrow gauge railroad up Aspen Mountain, in Tourtelotte Park and on to Richmond Hill and Ashcroft, for transporting the ore output of these localities to a point where it can be handled by the other roads entering Aspen. Those familiar with the situation regard it as one of the most promising of enterprises. The officers elected are: President, H. A. W. Tabor; vice-president, Ira W. Pendleton; secretary, L. M. Babcock; treasurer, W. R. Mygatt; chief engineer, C. E. Shriver; superintendent of construction, Geo. G. Merrick. It is understood that the work of constructing the line, which will embrace some 20 miles of track, will be commenced immediately. The survey is already completed and the other preliminary work finished.

## CONNECTICUT.

## FAIRFIELD COUNTY.

A company with a capital of \$50,000 has been formed for the purpose of working the newly-discovered silver and gold mine at Sandy Hook in Newtown. It is chiefly composed of Meriden capitalists. A claim has been made upon the mining land by parties representing Mrs. Samuel Tilson and Mr. Charles Hubbell, of Michigan. The present holders of the land are, however, pushing the work ahead and ignoring this claim.

## DAKOTA.

**BIG BEND HYDRAULIC COMPANY.**—Mr. G. W. Chadwick, the original promoter of this enterprise, now tells us that he sold out his interest in the company some four years ago, and that he has lately purchased again a controlling interest in it, and now proposes to conduct its operations upon a more vigorous, economical and profitable scale than has been done in the past. The statements made in the past by Mr. Chadwick concerning this property have not been supported by events; on the contrary, the whole Big Bend Hydraulic Company business, though on its face fair and honest, has presented many suspicious circumstances which have not been satisfactorily explained. We think that before inviting investors to take any interest in this enterprise, a trustworthy expert examination and report should be furnished, stating fully the present condition of the property and making clear its past history and dissipating the heavy shadows which have gathered around Mr. Chadwick's management.

**DAKOTA WATER POWER COMPANY.**—This is another of the schemes of that indefatigable gentleman, Mr. G. W. Chadwick. It is capitalized at \$3,000,000, and the shares have a par value of \$25. The company being incorporated under New York State laws, the shares are not assessable. The board of directors is composed as follows: John M. Littell, Wm. H. Johnson, George W. Clark, Jonathan Odell, B. G. Bloss, Luther N. Curtis, and Julian W. Chadwick. According to a pretentious pamphlet which has been sent to

the *ENGINEERING AND MINING JOURNAL*, the company has acquired various properties on the Rapid River between Rapid City and Pactola, and proposes to supply water for the use of the residents of Rapid City and for power for the various industries of the district. Similar statements were made by the same company a few years ago, with the additional promise of a dividend in a few months. This, like the Big Bend enterprise of the same promoter, calls for some disinterested and competent examination and report before it should receive attention from investors. We invite Mr. Chadwick to furnish this information, and it will give this *JOURNAL* pleasure to place the facts on record.

## LAWRENCE COUNTY.

**IRON HILL MINING COMPANY.**—At a meeting of the directors it was decided to levy an assessment of 3 cents per share. This will net \$7,500, a sum deemed ample to make the contemplated change by which the company's mill will be remodeled for treatment of refractory ores.

## IDAHO.

## LEMHI COUNTY.

**HELENA & IDAHO GOLD MINING COMPANY.**—This company owns two groups of mines at Gibbonsville, the Golden Circle of seven and the Twin Brothers of five. The ore is a strong iron pyrites, and new machinery is now ready to be put in place for its treatment. Mr. Thos. H. Walker is now on the way from Philadelphia to superintend the erection of the furnaces for roasting the ore, and an early test will be made of the adaptability of the machinery for working these mines. The officers are: A. J. Seligman, President; Chas. W. Cannon, Vice-President; John W. Eddy, Secretary; F. R. Wallace, Treasurer.

## ILLINOIS.

A largely attended meeting of Streator miners was held at Streator on the 18th inst. to take action on the attempts of the Chicago, Wilmington & Vermillion Coal Company to resume operations at No. 1 and No. 2 shafts. In both these shafts a number of men are at work running mining machines. The miners resolved to use every lawful means to induce these men to desist from work until the State Board of Charities at La Salle and the Board of Arbitration at this point conclude their investigation.

## FAYETTE COUNTY.

According to reports the prospectors for coal at Ramsey have been rewarded by finding a vein at a depth of 671 feet, after a six months' effort and the expenditure of about \$2,000.

## MARYLAND.

We are officially advised that the Potomac Mining and Reduction Company, which is composed of Chicago parties, and of which Mr. A. B. Meeker is President, has lately begun the work of mining gold quartz ores near the Great Falls of the Potomac, about fifteen miles from Washington. Gold has been known to exist in that locality for years, but until U. S. Senator Sawyer, of Wisconsin, developed a property in the last year, there has been no legitimate mining. He has erected a 10-stamp mill, and is crushing about 30 tons ore daily, which average \$18 per ton gold, wall to wall of a 5 foot vein. Other properties show much larger results, particularly one lately opened by the Potomac Mining and Reduction Company, which shows over \$30 per ton of free milling rock. The locality promises to be very productive, and with cheap labor and wood and water plenty, the cost of mining and milling will be very cheap. Senator Sabin, of Minnesota, and friends have lately purchased property about two miles from that owned by Senator Sawyer, and have begun active operations.

## MICHIGAN.

**BARAGO.**—This graphite mine, in northern Michigan, promises to develop into a matter of more than ordinary importance. Graphite comes from this mine in large chunks as it is blasted, and it is then easily put in merchantable form. For this purpose the same process is adopted as that used in grinding wheat. The old-fashioned Burr stones grind the graphite, and it is afterwards bolted like flour and sold according to its grade or fineness.

## MISSOURI.

## JASPER COUNTY.

**RIEGER MINING COMPANY.**—Considerable improvement is being made by this company, which has two and one-half lots on the Thacker land. Preparations are being made to put in a pump, after which the pump shaft will be sunk from 50 to 60 feet. Workmen have just completed a new tank, sluice trough, and a commodious shed for a number of jig tanks. The company is composed of Kansas City gentlemen, with C. A. Stewart, of that place, and one of the partners, as superintendent.

**RUBY MINING COMPANY.**—Two good zinc strikes were made last week on the new Ruby Company's land, south of Joplin. One strike was in the shaft of Immel Brothers at 17 feet, and the other in that of Davis & Co. at 32 feet. In the company shaft in which the first strike was made they are drifting at the depth of 75 feet on a 12-foot face of ore.

## MONTANA.

## LEWIS &amp; CLARKE COUNTY.

**MONTANA COMPANY, LIMITED.**—The official report for June shows that the total weight of ore crushed during June was 6,346 tons; yield from the three mills, \$126,200; working expenses for the month, \$53,000. The estimated number of ounces contained in returns by assay being, gold, 3,652 ounces; silver, 39,302 ounces.

## NEVADA.

**NEW EBERHARDT COMPANY.**—Reports state that the mine prospects are encouraging. Weekly output quantity, 42 tons; general average pulp during June

\$45 per ton; gross proceeds for June, \$12,500; expenses, \$4,000.

**ELKO COUNTY.**

[From our Special Correspondent].

Elko, July 13.

The Del Monte, North Commonwealth, Diana, Independence haven't much in sight, but things are very quiet there at present.

**COMMONWEALTH MINING COMPANY.**—The Union mill has closed down. There was shipped about \$25,000 last week's Commonwealth bullion. The company is prospecting for more ore.

**EYRIE.**—The Eyrie mine is shipping this week about \$40,000 in high-grade ore to Reno. It comes from the part of the claim which is on the same level as the 350-foot in Navajo. Horu Silver, with a large percentage of gold, specimens assaying as high as \$30,000 per ton. Mine is improving. The owners, Messrs. Smith & Kerr, are employing 15 men. The lessees on the Dexter are keeping up their output shipping also.

**GRAND PRIZE MINING COMPANY.**—The new pump is now on its way from Elko, and will be set up and at work next week. The concentrator is running and the ore body is increasing in quality and quantity; outlook good.

**NAVAJO MINING COMPANY.**—In this mine the east vein 360-foot level continues to show high-grade ore.

**NEVADA QUEEN MINING COMPANY.**—This company is getting some good ore at 550 feet.

**NORTH BELLE ISLE MINING COMPANY.**—This company has decided to sink the mine deeper 200 feet. It is rumored that they have a bonanza, a body of ore 15 feet wide—very high grade. It is being kept quiet, but miners will tell their friends.

**STANDING ELK.**—Superintendent Roberts is going to start up the smelter for a run on the silver lead ore which they have been some time accumulating. The above property has been a large producer in the past.

**MERIMAC DISTRICT—LONE MOUNTAIN.**

Mr. G. Coslett and partners are going to push the tunnel forward; started to tap the "Relief" and two other claims. Relief carries gold, silver and 40 per cent copper.

"LONGFELLOW."—This mine is mostly gold. The tunnel will develop all three.

"MONITOR."—This mine is lead silver ore; very wide ledge.

**EMERALDA COUNTY.**

[From our Occasional Correspondent.]

July 13, 1889.

**COLUMBUS CONSOLIDATED MINING COMPANY.**—This mine was started up May 27th as already mentioned in our issue of June 22d, the necessary money having been subscribed by a New York syndicate to prosecute the work. The property consists of four claims, known as the Secretary, Leo Mount Castle and Mountain Queen lodes, situated in the Columbus Mining District, one mile from Candelaria. There are four veins running the whole length of the claims, with outcropping, showing from four to eight feet. Veins have an easterly and westerly strike, with dip to the north. Mines are opened by a double compartment shaft 420 feet deep with five levels. The ledges run from a few inches to twelve feet in width. The ore averages \$100 per ton; 100 tons worked by the Northern Belle mill gave \$300 per ton. Assays can be seen at company's office as high as 3,730 ounces silver and 2 ounces gold per ton. The improvements above ground are the largest hoisting works in Southern Nevada, with a 60 horse-power engine, which has a capacity to sink the shaft 2,000 feet. There are two steel safety cages with four-inch flat steel cables; 250 tons of rock can be hoisted in 24 hours; there is also all the necessary shops, offices and buildings for a well-equipped mine. The pipes of the Candelaria Water Company run on the Columbus ground and are connected with the hoisting works. About \$150,000 has been spent in developing this property. The title is United States patents.

In the district there are four mills, in all 80 stamps, with a daily capacity of 240 tons of ore. Within one-quarter of a mile is the station of the Carson & Colorado Railway, where all necessary supplies are delivered and ore received for shipment to the mills. There are good roads from the depot to the mine. The mine is a continuation of and immediately adjoins the Mount Diablo property. It is also on the same lead and within 1,500 ft. of the Northern Belle and the Holmes mines. During the past month 17 men have been employed on the Columbus end, and a considerable quantity of ore taken out that will mill from \$100 to \$150 per ton. An Ingersoll steam drill is being put in to sink the shaft and prospect the mine; it is the first one ever used in this district.

Very favorable arrangements have been made for milling the ore. Assays from ore mined in June are, 157, 166, 94, 254, 188, 248, 326, 282, 377, 106, 977, 111, 273, 257, 179, 147, 185 ounces silver which will mill and net over \$100 per ton.

**EUREKA COUNTY.**

**EUREKA CONSOLIDATED MINING COMPANY.**—Late advices received in New York this week indicate that the loss by the recent fire was not so serious as was at first believed. The following telegram has been received from Mr. Wm. Fries the president of the company who has just arrived at Eureka: "Will get \$27,000 insurance and rebuild a smaller plant at once. Will continue buying ores. Expect to ship \$25,000 in bullion next week."

**LANDER COUNTY.**

**PITTSBURG MINING COMPANY.**—This company's mill has shut down because of the scarcity of water.

**NYE COUNTY.**

**BARCELONA MINING COMPANY.**—The ENGINEERING AND MINING JOURNAL is informed that this company's concentrating mill is running steadily, turning out its full capacity of 30 tons per day. Shipments of concentrates which are reported to run \$165 per ton are made every week. In the mine a force of about 16 miners are at work. From the 450 foot level a winze has been sunk 25 feet. The ore taken from this level is said to average \$300 per ton, and is the best that has been taken from the mine for the past six or eight months. We are indebted for this information to Mr. A. J. Severance.

**STOREY COUNTY—COMSTOCK LODE.**

**ANDES MINING COMPANY.**—Walter Turnbull, M. E., and M. P. Hall, M. E., of the Board of Directors of this company have been appointed a committee to go to the mine and inspect its workings and report back a plan of development.

**BUCKEYE MINING COMPANY.**—The ground of this company, recently incorporated, is situated in the canyon south of the Occidental ground, and was worked from 1860 to 1874. It has an incline shaft about 700 feet deep and a north and south drift on the vein 1,000 feet in length each on the lowest level. It has been worked on three levels.

**CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.**—The California battery mill began crushing Consolidated California & Virginia ore on July 6th. The mill will be operated by steam power, and will drop a sufficient number of stamps to keep up the bullion yield to the present average. The total production of bullion for June is valued at \$282,576.03, of which \$137,999.46 was gold and \$144,576.57 was silver. There was worked during the month 10,770 tons at both mills. The average yield in bullion was \$26.23 per ton, and the average assay value of the battery samples was \$30.45 per ton.

**CROWN POINT MINING COMPANY.**—Ore shipments from this mine have been suspended, owing to the shutting down of the Nevada mill for lack of water.

**HALE & NORCROSS MINING COMPANY.**—Ore shipments from this mine to the Nevada mill have been temporarily suspended on account of a lack of water for operating the mill. A draft of about 30 men has been made from the ore slopes. This company had shipped up to the 12th inst. bullion valued at \$73,897.41, but all the returns are not it.

**JUSTICE MINING COMPANY.**—The production in June amounted to about \$20,000.

**SAVAGE MINING COMPANY.**—There was shipped in bullion up to the 12 inst. on June account \$21,855.06.

**YELLOW JACKET MINING COMPANY.**—The average assay of battery samples of Yellow Jacket ore during June was about \$25 per ton. Ore shipments of 100 tons daily will be made from the mine after July 5.

**PENNSYLVANIA.**

**OIL.**

Exports of refined, crude, and naphtha from the following ports, from January 1st to July 13th:

	1889.	1888.
	Gals.	Gals.
From Boston.....	2,503,877	1,586,364
Philadelphia.....	66,824,664	59,657,504
Baltimore.....	1,898,349	3,611,852
Perth Amboy.....	10,074,497	12,533,857
New York.....	218,370,219	184,523,904
Total exports.....	299,671,666	261,963,501

The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of June, 1889, and during the twelve months ending June 30th, 1889, as compared with similar exports during the corresponding periods of the preceding years as follows: June, 1889, \$4,262,263; June, 1888, \$3,735,584; twelve months ending June 30th, 1889, \$49,420,817; twelve months ending June 30th, 1888, \$46,585,551.

**TENNESSEE.**

**RUTHERFORD COUNTY.**

Millard Adler, of New York, has leased from J. M. Quarles and others, of Nashville, the Mineral Paint mines near La Vergne, and will erect machinery to cost \$20,000 for excavating and preparing the mineral paint for shipment.

**UTAH.**

**BEAVER COUNTY.**

**HORN SILVER MINING COMPANY.**—In our report on the New York mining share market in the last issue of the ENGINEERING AND MINING JOURNAL, we printed a Salt Lake version of the causes which led to Mr. James T. Little's resignation as treasurer of this company. We now publish the statement of the president of the company, Mr. Allan C. Washington, as obtained from him this week by a reporter for the ENGINEERING AND MINING JOURNAL. "This is simply a series of misrepresentations," said Mr. Washington, when shown the Salt Lake story. "The facts of the case are these: Our stock is non-assessable, and in the course of a few months the ore now in sight in our mine will be worked out. We may have to call on our surplus for prospecting expenses. If we had paid out the cash in our treasury in dividends, what would we then do? We are sinking a new shaft in the north end of the mine, which is now down 157 feet, and showing, unfortunately, no encouraging prospects.

"If we now pay dividends with no ore in sight, other than the little that is left on the sixth and seventh levels, where can we get funds from? I have conferred with a number of the large stockholders who were all adverse to dividends, claiming that the interests of the stockholders are best subserved by thoroughly prospecting the mine. Nobody would give me a helping hand when I was endeavoring to put the mine on a sound financial footing, but the moment I get it in that position they want to wreck it.

"The whole proceeding originated with a parcel of stock jobbers, who have bought stock at the present low prices, and who, if they could get a dividend, would slide out with their profit, not caring what would become of the mine. Stockholders must bear in mind that when the present management secured control the company was in debt, and within the year they have brought it from that condition to a substantial surplus. The mine is being managed carefully and economically, and if the directors are let alone, in all probability, within a year, they will know whether they have a mine or not.

"In regard to Mr. Little's resignation, he had the surplus funds of the company deposited in the Desert National Bank of Salt Lake City, of which he is a director. When they amounted to \$150,000, I claimed that the company should receive an income from it, and that his bank should allow us interest upon it. It was too large a sum to be idle, particularly as his bank was loaning the money out in their regular business, and receiving interest upon it. Mr. Little seemed disinclined to do as requested and kept putting the matter off until I ordered the funds re-mitted to New York and deposited them with the United States Trust Company, where we are now receiving interest upon them. Mr. Little then resigned, and on June 25th Mr. A. I. Harrison, the company's secretary, was appointed treasurer."

[Both in holding the money for prospecting purposes instead of paying it out in dividends, and in requiring interest from the bank on the deposits, we fully indorse the action of the Horn Silver management as being prudent and in the interest of the stockholders.]

**UTAH COUNTY.**

**OZOKERITE MINING COMPANY.**—This company owns the extensive deposits of ozokerite or mineral wax described in the ENGINEERING AND MINING JOURNAL of July 6th. It is organized under the laws of the State of New York, with a capitalization of \$1,250,000, divided into 12,500 shares of \$100 each, which are non-assessable. The officers of the company are Jacob Wallace, President; Charles N. Barkley, Secretary and Treasurer, and Richard J. Kroupa, Superintendent. An office has been opened at 280 Broadway, New York, and a factory has been established in Greenpoint, L. I.

The property consists of 5,200 acres of land, held under the Mineral Land Act of the United States; 500 acres under the Desert Land Act, and a bond for title of 240 acres additional; is immediately on the Denver and Rio Grande Railroad, in fact, crosses same and White River, giving good milling location for works within 100 feet of track. Much of this territory is comparatively unexploited, and for the purpose of further developing it and increasing its productive capacity, the company is endeavoring to sell a number of shares of its stock.

**VIRGINIA.**

**AUGUSTA COUNTY.**

**FERRAL.**—Our correspondent advises us that Capt. Nathaniel D. Moore, so widely known in connection with his operations on the Gogebic Range, Michigan, has recently purchased the Ferral Mines, near Staunton, Va., on the line of the Chesapeake & Ohio Railway. These mines were formerly operated by the Grace Furnace Co., and the iron made from the ores was used at one time by the Confederate Government in the manufacture of cannon. The mines will be operated to supply ore to neighboring furnaces, Victoria and Low Moor.

**NEW RIVER COAL AND COKE COMPANY.**—This company has re-lighted its coke ovens after being out for three months. It will supply Victoria furnace.

**WEST VIRGINIA.**

**GREENBRIER COUNTY.**

**GLENMORE IRON COMPANY.**—Our correspondent advises us that this company, of which Gen. J. R. Anderson, of Richmond, Va., is president, is making contracts for the sale of its ores, and as soon as 100,000 tons per annum are sold, will build a branch road to connect with the Chesapeake & Ohio.

**WYOMING.**

**JOHNSON COUNTY.**

Ninety locations of placer lands, embracing 145,000 acres of choice petroleum ground in the Bonanza Oil Mining district of Johnson county, have been made and filed at Buffalo. The locators named, some of whom are prominent Omaha capitalists, are: Ernest Riall, Russell J. Straight, Albert M. Kitchen, Daniel H. Dorsett, Ernest V. Johnson, Charles P. Collins, Frank A. Hecht, William E. Hawley and P. M. Shannon. The same company has also secured 10,000 acres of oil lands in the Salt Creek district, on the southern boundary of Johnson county.

**FOREIGN MINING NEWS.**

**AFRICA.**

**ALGERIAN IRON ORE EXPORTS.**—Although the magnetic iron ore found in Algeria commands a ready sale in Great Britain and other countries, the shipments made last year by Mokta-el-Hadid Company showed a falling off, amounting to upward of 12,000 tons, which must, however, be entirely attributed to the scarcity of suitable tonnage; but this difficulty will now be overcome, since the company has chartered three British steamers to take 60,000 to 65,000 tons annually for a period of three years. The total output from the company's iron mines amounted to 335,890 tons, and might have been greater if there had not been considerable stock on hand which it was desirable to reduce.

CHINA.

Official trade reports from Tientsin (China) have of late frequently mentioned the Kaiping coal mine, which is worked according to foreign methods.

ORE MARKETS.

Leadville. July, 9th.

[From our Special Correspondent.]

The recent scarcity of lead carbonates at the Leadville smelters has been relieved by the Henrietta-Mad Consolidated Mining Company increasing their shipments two hundred tons per day.

The high figures that have to be paid for lead carbonates prevent any advance in siliceous dry ore, and the old rates still prevail of 95 per cent of New York quotations for the silver, less \$11 to \$14 per ton working charge.

There is a slight hardening in prices of sulphide ores; it is scarcely noticeable in grades containing less than twenty or thirty per cent of lead, and these may be quoted:

Table with 3 columns: Lead per cent, Per unit, Working charge. Rows for 10 to 20, 20 to 30, and 30 to 40 per cent lead.

For the silver 90 to 93 per cent of New York quotations. Zinc basis, 14 to 16 per cent, deduct 50c. for each unit in excess of basis.

The valley smelters have been drawing very little iron fluxing ore from this market of late, and as the mountain smelters are unable to take one-half the tonnage produced, there has been considerable pressure to sell.

MEETINGS.

Consolidated Stock & Petroleum Exchange Building Company, 63 Broadway, New York, July 18th, at one o'clock P. M.

ASSESSMENTS.

Table with 6 columns: COMPANY, No., When levied, Day of Sale, Amt't per share. Lists assessments for various companies like Andes, Baker Divide, Baltimore, etc.

\* Delinquent day and day of sale postponed to dates given above.

DIVIDENDS.

The following have been declared: Aspen Mining and Smelting Company of Colorado, dividend No. 9, twenty cents per share, or \$40,000, payable July 12th, at 54 Wall street, New York City.

Daly Mining Company, of Utah, dividend No. 29, twenty-five cents per share, or \$37,500, payable July 31st, by Lounsbury & Co., 15 Broad street, N. Y. City.

Homestake Mining Company of Dakota, dividend No. 132, ten cents per share, or \$12,500, payable July 25th, by Messrs. Lounsbury & Co., 15 Broad street, City.

Ontario Silver Mining Company, of Utah, dividend No. 158, fifty cents per share, or \$75,000, payable July 31st, by Lounsbury & Co., 15 Broad street, N. Y. City.

Quincy Mining Company of Michigan, dividend No. 42, two dollars per share, or \$80,000, payable August 15th, to stockholders of record, July 20th. Massachusetts stockholders will be paid at the office of N. H. Daniels, 35 Congress street, room 31, Boston.

MINING STOCKS.

For quotations see pages 63 and 65.

New York.

FRIDAY EVENING, July 19.

During the early part of the week a generally improved inquiry for mining shares was manifest, but latterly the market seems to have relaxed to its usual semi-dormant condition, with only occasional weakenings.

The Committee on Mining Securities met this week on Tuesday, and as usual but little business of importance was transacted. Reports were received from a number of companies to whom the committee recently wrote for information concerning the financial standing and condition of their properties, and a member of the committee tells us the reports were satisfactory.

The Deadwood Pioneer, after quoting from the ENGINEERING AND MINING JOURNAL the names of a number of mines that have recently been stricken from the list, says: "Why stop there? Sullivan Consolidated is still on the list." Referred to the Committee on Mining Securities insinuations and even direct statements as to the character of this enterprise have been very plentiful in the Dakota papers of late, and an investigation should be commenced at once.

The latest news as to the fire in the smelting works of the Eureka Consolidated Company is given in our mining news columns, to which, by the way, all investors in mining shares should regularly refer. It appears that the company will obtain \$27,000 insurance and \$25,000 from the sale of bullion on hand. It is thought that this \$52,000 will be ample to erect a plant of the size needed by the company. The old plant had been also too large, and its size greatly increased the cost of operation, and lessened the efficiency of the work.

The disaster, however, at this juncture was extremely unfortunate. It is hoped that another assessment may not be necessary. There were no sales of the stock during the past week.

Sutro Tunnel stock continues to be very quiet, and sales were made at 6@8c. The Trust Certificates were active, and advanced from 55@59c.

Navajo has been selling at 50c., and North Belle Isle declined from \$1.25 to \$1.00. Commonwealth is firm at from \$4 to \$4.25.

Consolidated California and Virginia in the beginning of the week declined from \$7.63 to \$6.75 and later advanced again to \$7.50. Crown Point was firm at \$2.20@2.30. Yellow Jacket was quoted at \$3.10.

Sierra Nevada at from \$2.20 to \$2.50. Savage at \$1.90. Ophir at \$4.85. Hale & Norcross advanced from \$2.90 to \$3.20. Gould & Curry declined from \$2.25 to \$2.05. Utah from 90 to 85c. Occidental was active, and advanced from \$2.23 to \$2.40. Mexican sold at from \$3 to \$3.20. Belcher advanced from \$3.10 to \$3.80. Alta was active and went from \$1.30 to \$1.50.

Ward Cons., of Colorado, to which we referred at length when it was placed upon the temporary list some months ago, has now been put upon the permanent list. The shares were called yesterday, and since then there has been some effort to manipulate the stock to create an appearance of activity.

The opening sale was made at \$1.10, and the price has advanced to \$1.25. Plutus was almost daily dealt in at from .80 to .83c. Little Chief declined from .33 to .30c. Breece shows one sale at .18c. Cashier sold at .04c. The Aspen Mining and Smelting Company paid its usual monthly dividend, No. 9, of twenty cents per share, or \$40,000, on the 12th inst. making \$360,000 paid to date.

There is no change to note in United Copper, which continues to sell at from \$1.10 to \$1.15. Silver King was firm all week at \$1. El Cristo was neglected until Wednesday, when it came out at \$1.40, and since then has been selling at \$1.30.

Rappahannock has, for the first time in many weeks, varied from its price of 7c., and has been selling at 6c. Standard has shown some activity towards the end of the week, selling at from 82 to 85c. Bodie Consolidated was quiet at \$1.10. Mono at 90c.

There was a lower tendency in Plymouth Consolidated which declined from \$8 to \$7.63.

Quicksilver Preferred continues to demand \$37 and \$38, and Common at first \$6.13 to \$6.50.

The Amadors remain at the usual prices. The Ontario Silver Mining Company has declared its regular monthly dividend of \$75,000, bringing the total up to date to \$10,250,000. The stock continues to hold its own at from \$35 to \$35.13. The Daly Mining Company continues to follow the good example of the Ontario, and has just announced its monthly dividend of \$37,500. There was quite a business done in Horn Silver, which was dealt in at from \$1.05 to \$1.15.

San Sebastian shows a few transactions at 30@40c. Mutual in the beginning of the week was firm at \$1.50, but to-day declined to \$1.40.

Boston. July 18.

[From our Special Correspondent.]

We have had another dull week for copper stocks, but prices have been well maintained, and the outlook is rather more promising. There is, however, no disposition to load up, and the orders either to buy or sell are very light. Calumet & Hecla holds steadily at \$206@208, with sales of only about 50 shares for the week. Boston & Montana is the most active stock on the list, and has shown considerable strength, advancing from \$34 1/2 to \$37, with a reaction to \$36. Sales about 2,000 shares.

Quincy sold for a small lot at \$49. The company have declared a semi-annual dividend of \$2 per share. Last year the July dividend was \$5.

Franklin and Atlantic steady at \$8 1/2@9 with very little doing in either. Osceola sold at \$8 1/2@9. Tamarack gained 1/2 on 25 shares at \$98 1/2 but lost it later and sold at \$98. Huron advanced from 62 1/2c. to 75c. on a single sale of 50 shares. Butte & Boston sold at \$22, same as last week.

Santa Fe has been quite active and on good buying advanced to 60c., but later sales were at 55c. Bonanza sold at 65@75c. There were no reported sales of Kearsarge, but it is stated that there have been quite large sales which have not gone on the official list.

In silver stocks Duxkin sold at \$1 ex-dividend. The manager has recently remitted \$5,000, and reports that the ore is improving. After paying the last dividend the company have \$35,000 on hand, and with an improvement in the grading of the ore there is a fair prospect of an extra dividend before the year closes.

Napa Quicksilver sold at \$3 1/2@3 3/4. 3 P. M.—There was no change after 12:30, except that Boston & Montana sold down to \$35 1/2, and recovered to \$36.

San Francisco. July 19.

The following quotations were received by telegraph from San Francisco to-day: Alta, \$1.30; Best & Belcher, \$3.55; Belle Isle, 25c.; Bodie, \$1.30; Bulwer, 30c.; Con. Cal. & Va., \$7.60; Chollar, \$1.45; Crown Point, \$2.15; Commonwealth, \$4.30; Eureka, \$1.40; Gould & Curry, \$2.05; Hale & Norcross, \$2.90; Mexican, \$2.95; Mono, \$1; Navajo, 40c.; N. Belle Isle, \$1.10; Nevada Queen, \$1.35; Ophir, \$4.60; Potosi, \$1.45; Savage, \$1.65; Sierra Nevada, \$2.35; Union, \$2.95; Utah, 75c.; Yellow Jacket, \$2.80.

Electric Stocks.

Seventy-five thousand out of 95,175 shares of stock voted to substitute the charter of the Westinghouse Electric and Manufacturing Company for those of the Westinghouse Electric Company and the Charters Improvement Company at the meeting held in Pittsburgh last week. Under the operation of the change, as already mentioned in our issue of July 6th, the stock of the two old companies will be exchanged share for share for the stock of the new company, and the officers were directed to make the transfer at once. The new company assumes all contracts now in existence with the old companies. After the transfer of stocks has been completed the Westinghouse Electric Company will settle up its affairs and be dissolved by law. The charter of the new company grants extensive powers in the matter of obtaining control of other companies, and permits of any increase of the capital stock.

The syndicate known as the Thomson International Electric Welding Company will after July 15, have disposed of its rights and be organized as the Thomson European Electric Welding Company.

The Thomson European Electric Welding Company was organized at Portland, Me., on the 15th inst., and the following officers have been elected: President, Oliver Ames; Treasurer, W. A. Boland; Directors, Oliver Ames, S. Endicott Peabody, B. F. Spinney, J. N. Smith, W. A. Boland, Charlton T. Lewis, L. A. Von Hoffman, S. D. Babcock and H. D. Hyde. Lewis Von Hoffman, S. D. Babcock are of New York. All have accepted.

PIPE LINE CERTIFICATES.

NEW YORK STOCK EXCHANGE.

Table with 5 columns: Opening, Highest, Lowest, Closing, Sales. Rows for July 13, 15, 16, 17, 18, 19.

Total sales in barrels..... 1,529,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

Table with 5 columns: Opening, Highest, Lowest, Closing, Sales. Rows for July 13, 15, 16, 17, 18, 19.

Total sales in barrels..... 2,031,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 19.

Statistics.

PRODUCTION OF ANTHRACITE COAL for week ended July 13th, and year from January 1st.

Table showing anthracite coal production statistics for various companies and regions, comparing 1888 and 1889 data.

Decrease..... 527,740

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 OF BITUMINOUS COAL for week ended July 13th, and year from January 1st.

Table showing bituminous coal production statistics for various companies and regions, comparing 1888 and 1889 data.

Table showing western shipments of coal for various destinations like Pittsburgh, Westmoreland, and Monongahela.

PRODUCTION OF COKE on line of Pennsylvania R. R. for week ending July 13th and year from January 1st.

Anthracite.

This market gains only in dullness. Producers and dealers report "absolutely nothing doing, no new business whatever."

The mistake the companies made this year, as it did last, was in making the opening prices too high. We pointed out at the time that the natural effect of this would be to discourage early buying and to force too large a part of the business of the year into the last four months.

This subject should have more careful consideration, and be settled rather on the basis of statistics than on the rosy anticipations of gentlemen whose motto is always "Excelsior."

The Boston News Bureau of the 16th inst. says: "It is stated on good authority that Coxe Bros. & Co.'s suit against the Lehigh Valley Railroad will be decided against the railroad company."

We have no further advice concerning the decision of the commission, and no one knows what it will be, though from a study of the evidence we long ago received the impression that Coxe Brothers would gain at least in part of what they have contended for.

The following are the quotations for free burning coal, f.o.b., New York shipping ports: Broken coal, \$3.90; egg and chestnut, \$4.15, and stove, \$4.40 per ton.

Mr. John H. Jones, Chief of Bureau of Anthracite Coal Statistics, furnishes the following statement of anthracite coal production for the month of June,

1889, compared with the same period last year, compiled from the returns furnished by the mine operators:

Table comparing anthracite coal production in 1888 and 1889 for Wyoming, Lehigh, and Schuylkill regions.

Table showing monthly anthracite coal production for 1888 and 1889, including year-to-date comparisons.

The stock of coal on hand at tide-water shipping points: June 30th, 1889, was 833,764 tons; on May 30th, 1889, 962,066 tons; decrease, 128,302 tons.

Mr. Jones also furnishes a statement showing the general distribution of the entire production of anthracite coal for the year ending December 31st, 1888; to this we have added, for comparison, the distribution in previous years.

Table showing the general distribution of anthracite coal production by region and destination for 1888 and 1889.

Buffalo.

[From our Special Correspondent.] July 18. There is absolutely nothing of importance to state relative to the anthracite coal trade. Bituminous is getting scarce, and prices are likely to advance; at present dealers do not deem it advisable to make any change, but they will not make fresh contracts, that is certain.

The Reading officials are making strong efforts to obtain an independent railroad from their mines to our port and Canada. Several lines have been proposed and connections suggested. It is probable that, before long, a route will be chosen and work commenced.

The Lehigh Valley people are making efforts to develop the new coal territory in Schuylkill County, one near Pottsville and the other near Minersville. There are 46 tracts in the company's territory, and an expert says that "all of them will show coal deposits, and that there is room for a dozen collieries, and a prospective yearly output of 2,000,000 tons."

Fire still smoulders deep down in the piles of anthracite coal on the St. Paul and Pacific Dock, at Duluth, and the prospects of extinguishing the burning fuel are discouraging, as open shafts under the mass furnish a circulation of air that greatly aids the fire.

The schooner Mott, which was sunk off Colchester Reef in 1884, had on a cargo of coal. Last week the coal was raised (nearly 550 tons) and sold.

Chief Engineer Hoyt, of the Buffalo, Rochester & Pittsburgh Railroad, reports remarkable activity in the development of the bituminous coal lands of Northwestern Pennsylvania.

For the fiscal year ending June 30, 1889, the traffic through the Sault Ste. Marie canal of coal aggregated 1,854,527 tons, an increase over 1887-88 of about 150,000 tons in coal tonnage.

Lake shipments of coal from this port from July 11th to 17th, both days inclusive, aggregated 59,690 net tons, namely: 29,690 to Chicago, 12,950 to Milwaukee, 4,800 to Duluth, 5,300 to Superior, 1,100 to Manitowoc, 600 to Green Bay, 1,100 to Marquette, 150 to Bay City, 400 to Saginaw, 3,600 to Ashland; total for the season to date, 748,230 net tons. The rates of freight were 50c. to Chicago, Milwaukee, Green Bay, Marinette, Portage, and Manitowoc; 40c. to Superior, Duluth, Ashland, Saginaw, and St. Clair; 45c. to Marquette, and 25c. to Detroit and Bay City.

Shipments of coal by canal hence: two boatloads to Syracuse 60c. per gross ton, free off, and one load to Illion 70c. per net ton, free off. Receipts of coal by canal to second week in July, 2,746 tons; the shipments, 1,085 net tons.

A coal heavers' strike was inaugurated at Superior, Wis., on the 17th inst. The Lehigh coal heavers quietly walked out and refused to handle coal at less than 50 cents per hour. The great lockout this spring, in which the heavers stood out for 50 and were off in 40 cents per hour, was lost by the strikers, but they have watched their opportunity. They saw that all the surplus labor was employed, and, with a fleet of coal vessels at the dock, victory seemed sure.

Pittsburg. [From Our Special Correspondent.] July 18.

Coal.—The situation on the Monongahela remains unchanged. The strike in the three lower pools continues, so far as relates to the river miners. The coal owners refuse to start their mines at 3 cents; the miners refuse to accept less. All the Southern and Western markets are well supplied.

The normal rates are: PRICE OF COAL PER 100 BUSHELS = 7,600 LBS. First pool.....\$4.75 Fourth pool.....\$3.25 Second pool.....4.50 Railroad coal.....5.00@6.00 Third pool.....3.90

Connellsville Coke.—Imports continue to brighten. It seems safe to assume that the bottom has been reached, and that the first movement will be an advance. Unless all signs fail the advance is not far off, and with a reasonable prospect of a good demand for raw iron it is only fair to suppose that coke will be higher.

Quotations as follows per ton: Furnace coke...\$1.05@1.10 Crushed.....\$1.50 To dealers.....1.10@1.15 Foundries.....1.25 Freight rates from the ovens to Pittsburg, 70c. per ton; to Shenango Valley, \$1.35; Cleveland, \$2.80; East St. Louis, \$3.50; Chicago, \$2.75.

A COKE STRIKE PROBABLE. The Workers Demand a Reconsideration of the Wage Scale.

The convention of organized and unorganized cokers, at Everson, yesterday, passed resolutions severely criticising the operators for their indifference to the plea of the cokers, and because of their refusal to hold a conference with organizations on wage questions.

A delegate convention has been called for July 27, to consider the action of the employers. The cokers demand the scale of wages prepared on April 15th, with a few exceptions. The additions to the scale are: Blacksmiths, \$2.50; carpenters, \$2.25; helpers, \$1.85, and car greases, \$1.75.

FREIGHTS.

The following rates per ton of 2,240 lbs. for coal carters are reported: From Baltimore to: Bangor, 1.25; Bath, Me., 1.20; Boston, Mass., 1.15; Bridgeport, 1.05; Brooklyn, 1.00; Charleston, .75@.80; Fall River, 1.05; Galveston, 3.25; Gardner, 1.40; Lynn, 1.25; New Bedford, 1.05; Newburyport, 1.40; New Haven, 1.05; New London, 1.05; New York, 1.00; Portland, 1.15; Portsmouth, N. H., 1.20@1.25; Providence, 1.10; Quincy Point, 1.15; Richmond, Va., .70; Salem, Mass., 1.15; Savannah, 1.10; Somerset, 1.05; Weymouth, 1.20; Williamsburg, N. Y., 1.00; Wilmington, N. C., 1.00.

From Philadelphia to: Annapolis, 70; Baltimore, .60; Bangor, Me., 1.15; Boston, 1.10@1.15; Charleston, .75; Charlestown, 1.20; Chelsea, 1.20; East Cambridge, 1.15; Fall River, .80@.90; Gardner, Me., 1.15; Georgetown, D. C., .85; Gloucester, 1.20; Lynn, 1.25@1.35; Milton, 1.25; New Bedford, .90@.90; Newburyport, 1.30; New York, .90; Norfolk, Va., .65; Portland, 1.15; Portsmouth, N. H., 1.15; Providence, .90@.90; Richmond, Va., .60; Salem, 1.20; Savannah, 1.15; Washington, .85.

From New York to: Boston, Mass., 1.00; Bridgeport, Conn., .65; Fall River, .75; Norwich, .70; Portland, 1.00; Portsmouth, N. H., 1.10; Saco, 1.10; Salem, Mass., 1.00; Saugus, 1.15.

\* And discharging. † Alongside.

METAL MARKET.

NEW YORK, Friday Evening, July 19, 1889. Prices of silver per ounce troy.

Table showing metal market prices for Sterling, London, and New York exchange rates for July.

Silver market has remained steady without special features. Council bills declined 1/8d.

United States Assay Office at New York reports total receipts of silver for the week 175,000 ounces.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

Table showing domestic and foreign coin prices for Trade dollars, Mexican dollars, Peruvian soles, English silver, Five francs, Victoria sovereigns, Twenty marks, Spanish doubloons, Spanish 25 pesetas, Mexican doubloons, Mexican 20 pesos, and Ten guilders.

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting made no change in its minimum rate of discount, which remains at 2 1/2 per cent. During the week the bank lost £176,000 sterling bullion,

and the proportion of its reserve to its liabilities was reduced from 39.05 to 38.03 per cent, against an advance from 38.48 to 39.31 per cent in the same week last year, when its rate of discount was 2½ per cent. The weekly statement of the Bank of France shows a gain of 6,250,000 francs gold and a gain of 650,000 francs silver. The weekly statement of the Imperial Bank of Germany shows a specie loss of 180,000 marks.

**Copper.**—There is nothing of much interest to report about the copper market during the week just past. Business is very quiet, and, although the quotation of 12c. is still upheld by the producing companies for Lake brands, there appears to be a certain amount of underselling in some quarters as retail quantities are now obtainable at that figure and even a trifle lower in some instances. With good casting copper selling at about 10½c. the quotation of 12c. for Lake Superior brands shows a very unusual and unjustifiable difference in values, and with the heavy production of casting copper now taking place there seems little prospect of any early improvement in prices for such descriptions. Under these circumstances the natural tendency would appear to be in favor of gradually lower prices for Lake, until the normal difference of about ½c. per pound above the price of casting copper is reached, and we have no doubt that that condition of affairs will be reached before very long, as otherwise the comparative cheapness of the inferior metal will encourage consumers to make use of it whenever they possibly can in place of Lake brands. A meeting took place during the past week in Boston between the representatives of the Lake companies, with the object of strengthening the combination and making more stringent regulations to prevent sales under the agreed figure of 12c. The present quotations are as follows: Lake copper, 12c.; casting copper, 10½c.

In London the prices for Chili Bars and G. M. Bs. have given way about 5s. a ton during the week, and the last quotations received by cable are Spot, £40 15s., and three months futures, £40 5s. According to cable advices the statistics of visible supplies again show a decrease of 900 tons for the first half of July, but this improvement in the statistical position is not as marked as was generally expected.

The exports of copper from New York during the past week were as follows:

	Copper.	Lbs.	
To Liverpool—			
By S. S. Spain.....	200 bbls.	250,000	\$30,000
To Amsterdam—			
By S. S. Amsterdam.....	137 casks.	22,506	2,700
To Hamburg—			
By S. S. Rhaelia.....	2 casks.	2,500	300
	9 bars.	554	1,100
To Havre—			
By S. S. La Bretagne.....	90 casks.	112,500	13,500
To Liverpool—			
By S. S. Spain.....	5,652 sacks.	565,200	39,560

**Tin.**—The market has again been rather a fluctuating one, prices varying from day to day in accordance with the movements in London. The net result in London during the week is a decline of 7s. 6d. to 10s. a ton, the latest closing quotations from that market to-day being, Spot, £88 7s. 6d.; three months, £88 17s. 6d. In this market there have been some signs noticeable of a better tendency, and the demand is also improving. Our closing quotations to-day are, Spot, 19.85; July, 19.85; August, 19.90; September, 19.95.

**Lead.**—In the early part of the week the market was rather flat, with values tending to a lower level. On Thursday, however, the publication of a circular letter of instructions from the Secretary of the Treasury to the Collectors of Customs at El Paso, Eagle Pass and Laredo with reference to the regulations for importations of Mexican ores containing silver, and lead produced a rather firmer feeling, as it was generally believed that whilst the circular referred to did not touch on the question of the proposed alteration of the mode of assessing the duty on such ores, the more stringent regulations would lead to a good deal of ore being prevented from crossing the frontier on the old footing of silver ore. On the other hand, many people well able to judge consider these new regulations cannot be carried out in practice, and any attempt to enforce them would inevitably result in serious and protracted litigation. (On this subject we comment more fully on another page.)

Beyond producing a rather firmer feeling, the quotations for lead have not improved much, and we close to-day at Domestic, common, spot, 3.85; July, 3½c.; August, 3¼c.; Foreign, 4.87½c.; Sheet, per pound, 6¼c.; Pipe, per pound, 6c.; Tin-lined pipe, per pound, 15c.; Shot, per 25-pound bag, 1.25c.; Spanish lead, London, £12 7s. 6d.

**The St. Louis Market.**—Messrs. John Wahl & Co. telegraph us to-day as follows: The situation remains substantially unchanged. The demand shows no improvement, and if there is any change at all, it is in the direction of lower prices. Consumers continue to buy from hand to mouth only. Both common and refined obtainable at 3.72½@3.75c., with light sales at these figures.

**The Chicago Market.**—Messrs. Everett & Post telegraph us as follows: For the past week business at this point has been light. Consumers being well supplied for the immediate future, are now holding off until something definite is known as to the treasury decision. At the close we call the market 3.8c. asked for July delivery, and August held at 3.85c.

**Spelter** is still rather dull, with business far from active, at 5c. Foreign is quoted at 5c. per lb. and £19 5s. per ton. American sheet zinc, per lb., 6¼c.

**Antimony** remains firm in tone and in satisfactory stiffer, the latest London quotation being £9. Spot prices here are 64@65c. per lb.

**Quicksilver.**—The foreign market is slightly stiffer, the latest London quotation being £9. Spot prices here are 64@65c. per lb.

**Nickel.**—Importations this year have been very much lighter than usual on account of the increased European consumption. This diminution of the receipts from foreign sources has kept the local market very bare for some time past, and temporarily, at least, the supply is not equal to the demand. We quote nominally 65@70c.

## IRON MARKET REVIEW.

FRIDAY EVENING, July 19.

**Pig Iron.**—The chief feature of the market is its quietness. With a few exceptions, consumers are supplied for immediate needs and holders have not enough iron to make them anxious to sell. The advantage, however, appears to be rather in the position of the latter, and consequently, while few actual sales are being made, prices continue firm. We can learn of no business of importance during the week save a few small sales by Southern furnaces. This is the situation at the moment. Any prediction as to the course of the market during the latter half of the year must be so largely conjectured as to scarcely be worthy of record. Our quotations remain at \$17.00@18.00 for No. 1 Foundry; \$16.00@17.00 for No. 2, and \$15.00@15.50 for Gray Forge, which is rather scarce, some of the furnaces having sold up their product of forge irons for some time to come. Southern brands are held at \$16.50@17.50 for No. 1, \$15.50@16.50 for No. 2, and \$14.75@15.00 for Gray Forge.

**Scotch Pig.**—In sympathy with the foreign market prices here have shown an upward tendency, but have not increased to a parity with prices at primary points. There have been several sales of 100-ton lots. Quotations are advanced about 25 cents per ton. Prices now ruling are: Dalmellington, \$19.75; Eglington, \$19.25; Langloan, \$21.25; Summerlee, \$21.75; Shotts, \$21.25; Coltness, \$21.75. The following quotations were received by cable to-day to the Metal Exchange: Scotch Warrants, 43s. 10d.; Coltness, at Glasgow, 54s.; Langloan, at Glasgow, 54s.; Summerlee, at Glasgow, 54s.; Gartsherrie, at Glasgow, 52s.; Glengarnock, at Ardrossan, 51s. 9d.; Dalmellington, at Ardrossan, 45s. 6d.; Eglington, at Ardrossan, 44s.

**Spiegeleisen.**—The market is extremely dull and it is difficult to find either buyers or sellers. Very little, if any, is offered on the spot, and quotations are more or less nominal at \$28@28.50 per ton for either English or German brands. There seems to be some difference of opinion among importers as to the price of 80 per cent ferro-manganese, but in the absence of actual sales to test values we quote nominally \$59@60, with the observation that it could possibly be bought for less.

**Billets, Slabs and Rods.**—Nothing is being done in the imported articles. Foreign wire rods are quoted at \$43 and American steel nail slabs at \$29.50.

**Steel Rails.**—There is still some inquiry, and a number of small transactions are reported for the week. It is not believed that less than \$28 has been accepted, and even at this figure most of the mills claim to be so well supplied with orders that it is impossible to guarantee early deliveries. It must be remembered, however, that the capacity of the various mills is enormous, and that few of the transactions that have been recorded during the past few months were large enough to seriously tax the capacity of any one of the mills for more than a comparatively brief period, and on a number of the larger orders deliveries were so arranged that the mills may pick up whatever there is in the market. According to the published report of the Board of Control of the Steel Rail Association for the first half the year, the Illinois Steel Company (North Chicago, Juliet, and Union combined) has shipped during the six months ending July 1st, on account of 1889 allotments, in round numbers 140,000 tons, the Edgar Thomson, 135,000; Scranton, 73,000; Lackawanna, 62,000; Bethlehem, 49,000; Cambria, 29,000; Cleveland, 11,000, and Troy a little over 2,000, making the total shipments a little less than 520,000, against 585,558 tons to July 1st, 1888. It is therefore apparent that no great scarcity of rails is to be apprehended. It is reported by the *Railroad Gazette* that 1,410 miles of new railroad were built in six months of 1889, against 2,980 miles in the first half of 1888.

**Structural Iron and Steel.**—There is considerable activity in this line both on account of the orders that were booked in June and to a lesser extent on recent business. The stoppage at the Homestead works on account of the strike had little effect on the market when it was announced and consequently had none when it terminated. In these days of great production, a stoppage at a single mill occasions only temporary embarrassment to its customers, as was evidenced at the time of the Cambria disaster. Prices continue firm, with a slightly upward tendency. We quote as follows, at mill: Bridge plate, 2½c.; angles, 2@2½c.; Tees, 2.5@2.6c.; steel angles, 2.5c.; beams and channels, on wharf, 2.8c.

**Steel Plates** are held as follows on wharf: Tank and Ship, 2.25; Shell, 2.4@2.5; Flange, 2.8; Fire-Box, 3.50@4.

**Iron Plates** are quoted as follows on wharf: Common tank, 2.25c.; refined, 2.3@2.4c.; shell, 2.4@2.5c.; flange, 3.5@3.7c.; extra flange, 3¾@4.

**Bar Iron.**—At mill common is quoted at 1.6@1.7c., and refined at 1.75@1.9c. Deliveries from store are quoted as follows: Common, 1.9c. base; Refined, 2c. base; "Ulster," 3c. base; "Norway," 5c. shapes, and Norway nail rods, 5c.

**Merchant Steel.**—Prices are steady and the business current is of a very fair volume. We quote as follows: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; Bessemer machinery, 2¼@2½c.; Bessemer spring, 2¼@2½c.

**Pipes and Tubes.**—A meeting of the Wrought-iron Pipe and Tube Manufacturers' Association was held Wednesday afternoon at the Oriental Hotel, Coney Island. Those present were Joshua Rhodes, C. B. Herron, J. H. Murdock, and D. E. Lyon, of Pittsburgh; J. Don, of Troy; G. Timmins, of Syracuse; A. Wheeler, J. Roland, and L. J. Piers, of Philadelphia; A. L. Murphy, of Conshohocken; L. J. Hearn, of Wheeling; J. J. Spowers, and C. Wharton, of New York; A. S. Mateson, of Youngstown, O., and J. Hoover, of Norristown. Prices were advanced from two to two and a half per cent, in accordance with the revised schedule. Wrought-iron pipe prices are subject to the following discounts: Butt-wheeled, plain and tarred, 50 per cent discount; galvanized, 42½ per cent discount; lap-welded, plain and tarred, 62½ per cent discount; galvanized, 50 per cent discount. A discount of 57½ per cent is allowed on boiler tubes of 2 inches and larger, and 52½ per cent on 1¾ inches and smaller.

**Cast Iron pipe** remains at \$25.50@30, according to size.

**Rail Fastenings.**—Apart from a number of small and unimportant sales, there is nothing new to report. The following are ruling prices: Spikes, 1.95c.; angle fish-bars, 1.75@1.85c.; bolts and sq. nuts, 2.70@2.75c.; bolts and hex. nuts, 2.80@3c.

**Old Material.**—Old rails are in light supply. We get quotations of \$22.75@23 per ton for Tees, No. 1 wrought scrap is held at \$21, cast scrap at \$15.50, and old car wheels at \$18.

## Cleveland.

July 19.

(From our Special Correspondent.)

There is no change in the iron ore situation, either as regards prices, sales, receipts or shipments; all are steady. Shipments from the mines for week ending July 10th were 247,666 gross tons, an increase over last year for corresponding week of 91,819 tons. Shipments for season of 1889 up to July 10th, 2,598,642 tons; season of 1888 up to July 10th, 1,350,379 tons; increase for 1889 up to July 10th, 1,248,263 tons.

This is a wonderful increase, but more wonderful still in the fact that the ore market shows no weakness, and that the average price is somewhat higher than last year. Lake freights are easier, but with no change in rates. Nearly everything on the lakes is carrying iron ore. If grain comes forward rapidly later, freights will advance sharply. Shipbuilders and vessel owners are greatly interested in the reports relative to the fleet of steel steamers to be constructed for the Minnesota Iron Company and the Lake Superior Iron Company. The mine owners are talking a good deal about building themselves, and saying what profit there is in the business, but this talk is mostly for the sake of beating down the prices of the shipbuilders. The example of the Cleveland Iron Mining Company in building the largest and most approved style of steel steamers for carrying their own ore is being followed by the other large mining companies.

Quotations remain the same.

## SPECULAR AND MAGNETIC ORES.

Bessemer, 66 to 69 per cent.....	\$5.50@6.25
60 to 61 ".....	4.56@ 5.50
Non- " 66 to 69 ".....	5.00@ 5.25
62 to 65 ".....	4.25@ 4.75
57 to 60 ".....	3.75@ 4.00

## SOFT HEMATITES, DRIED, AT 212.

Bessemer, 62 to 65 per cent.....	\$4.50@5.00
59 to 61 ".....	4.25@ 4.50
Non- " 57 to 62 ".....	3.50@ 4.25

Above prices are delivered at docks at Lake Erie ports.

## Louisville.

July 13.

(Special report by Hall Bros. & Co.)

There has been no material change in the situation since the last report. The market still remains firm, but transactions have not been in as large quantities, though more frequent. Some round sales of charcoal iron have been made at full figures. We continue the quotations same as last, which are cash f.o.b. cars Louisville:

## Hot Blast Foundry Irons.

Southern Coke, No. 1.....	\$14.75@15.25
" " No. 2.....	14.00@ 14.50
" " No. 3.....	13.75@ 14.25
Mahoning Valley, Lake ore mixtures.....	17.50@ 18.00
Southern Charcoal, No. 1.....	16.50@ 17.00
" " No. 2.....	16.00@ 16.50
Missouri " No. 1.....	17.50@ 18.00
" " No. 2.....	17.00@ 17.50

## Forge Irons.

Neutral Coke.....	13.25@ 13.75
Cold Short.....	13.00@ 13.25
Mottled.....	12.00@ 12.25

## Car Wheel and Malleable Irons.

Southern, standard brands.....	21.50@ 22.00
other brands.....	17.50@ 18.00
Lake Superior.....	22.00@ 22.50





or three months, Mr. Nichols has stricken them off his list to arrive for the present, to show the visible supply to the end of the year. There has been another October-November charter at \$1.85.

Under the heading of "More Frauds in Fertilizers," a contemporary has the following: "The Pennsylvania Board of Agriculture reports that a certain 'complete fertilizer,' offered at \$20 per ton, is really worth, by analysis, only \$1.12. Another selling for \$21, has a manurial value of just 71 cents. A third, whose price is \$18, is worth but 17 cents. And yet there are many valuable fertilizers, and they are furnished by trustworthy parties. The only safe rule is to purchase of reputable manufacturers or dealers, after a careful study of the reports of the most capable official analysis." The latter statement receives our earnest indorsement. The manufacture of fertilizers nowadays in strict accordance with law is by no means so profitable as in the old days when State Experiment Stations were unknown, and the temptation to fraud is constant. Not only purchase of reputable dealers, but also have the nearest station occasionally test what you are buying.

From the report of the Bureau of Statistics issued this week, giving the importations of various articles of merchandise during the month of May, 1889, we condense the following statement:

Table with 3 columns: Item, 1889, 1888. Items include Bleaching powder, Bicarbonate soda, Sal soda and soda ash, Caustic soda, Murate of potash, Nitrate of soda, Brimstone.

"Concentrated tankage" is the latest fertilizing material. It is tank water, evaporated, dried and treated chemically, and is sold in two grades carrying respectively from 13 1/2 to 15 1/2 per cent, and from 16 to 18 per cent of ammonia. It is quoted at \$2.32 1/2 per unit.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, July 19. During the first half of 1889 plans were filed in New York City for 2,170 buildings, with an estimated cost of \$41,084,072, against 1,647 buildings with an estimated cost of \$25,524,678 during the corresponding period in 1888. This is an excellent showing from a statistical point of view, but as on many of these projects no work has been actually commenced as yet, the demand for material has not increased as much as the statistics would indicate. During the latter part

of June, and thus far in July, however, the demand has considerably improved; and while there are no indications of a coming "boom" or anything approaching thereto, it is probable that there will be at least a fair consumption of material during the year.

Bricks.—The manufacturers have overdone the thing again. Instead of following the same conservative policy in regard to shipments which made the recent advance possible, at the beginning of the week they sent forward cargoes to such an extent that the market was soon weakened and prices depreciated. On the whole, however, the decline has not averaged much over 25 c. per m., and as the demand is steady or fairly so, a few days' curtailment of shipments should enable sellers to regain their former advantage. At the hour of writing the surplus offering is difficult to estimate; it is at all events sufficient to depress prices. We quote as follows: Haverstraw, \$5.75 @ \$6.25; Upriver, \$5.55 @ \$5.75; Jersey, \$4.25 @ \$5; pale, \$3.25 @ \$3.75.

A number of brickmakers, who are organized under the name of the New York and New Jersey Brick Manufacturers' Association, met on Wednesday at the Cosmopolitan Hotel, and passed a resolution declaring that it was the "sense" of those present that no brick should be made during the present season after October 1st. Readers may rest assured, however, that both the "association" and its resolutions are entirely harmless. Until some stronger combination than is now existent is made, brickmakers are likely to make brick as long as they can sell them, or until the frost enters the ground.

Lime.—The demand is still good, and arrivals none too plentiful. Prices are steady and unchanged for all grades and brands.

Cement.—Our importations of cement during May, according to the report of the Bureau of Statistics issued this week, amounted to 128,552 barrels, against 210,604 barrels in May, 1888; and during the eleven months ending May 31st, 1889, were 1,340,561 barrels, as compared with 1,827,839 barrels during the corresponding period of a year ago.

CONTENTS.

Table with 2 columns: Article Title, Page. Includes Latest Fad in Chemistry, Dr. David T. Day, A World's Fair in 1892, etc.

Table with 2 columns: Article Title, Page. Includes South African Gold Fields, Treasury Rules for the Admission of Mexican Silver, Lead Ores, etc.

Table: IMPORTS AND EXPORTS OF METALS AT NEW YORK JULY 6 TO JULY 13, 1889, AND FROM JANUARY 1. Columns: Item, Week, Year, Tons, Lbs., Casks.

Table: IMPORTS AND EXPORTS OF METALS AT NEW YORK JULY 6 TO JULY 13, 1889, AND FROM JANUARY 1. Columns: Item, Tons, Lbs., Casks.

Table: IMPORTS AND EXPORTS OF METALS AT NEW YORK JULY 6 TO JULY 13, 1889, AND FROM JANUARY 1. Columns: Item, Tons, Lbs., Casks.

STOCK MARKET QUOTATIONS.

Table with columns: COMPANY, Bid, Asked. Includes Baltimore, Md. and Birmingham, Ala. entries.

Table with columns: COMPANY, Bid, Asked. Includes Old Colony, Pat Murphy, Phillips, etc.

Birmingham, Ala.

Table with columns: COMPANY, Bid, Asked. Lists various Birmingham companies and their stock prices.

Auction Sales of Stocks.

The following securities were sold at public auction in New York last week: 500 shares Cameron Iron and Coal Co. \$25 lot 490 shares Stout Electric and Storage Battery Co. 16 "

Electric Stocks. July 12.

Table with columns: COMPANY, Par value, Market price. Lists electric utility stocks and their prices.

Trust Stocks. July 19.

Table with columns: COMPANY, Sales, Price. Lists trust company stocks and their prices.

Kansas City. July 2.

Table with columns: COMPANY, Par value, Bid, Asked. Lists Kansas City stock market data.

Foreign Quotations.

Table with columns: COMPANY, Highest, Lowest. Lists foreign stock market data.

Pittsburg, Pa.

Table with columns: COMPANY, H, L, Closing. Lists Pittsburg stock market data.

London.

Table with columns: COMPANY, Highest, Lowest. Lists London stock market data.

St. Louis. July 17.

Table with columns: COMPANY, Bid, Asked. Lists St. Louis stock market data.

Paris.

Table with columns: COMPANY, Bid, Asked. Lists Paris stock market data.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Large table listing various chemicals and minerals with their prices, including Acid-Acetic, Muriatic, Sulphuric, etc.

Table listing prices for various metals and minerals like Strontium-Nitrate, Sulphur-Roll, etc.

THE RARER METALS.

Table listing prices for rarer metals like Aluminum, Arsenic, Barium, Bismuth, etc.

BUILDING MATERIAL.

Table listing prices for building materials like Bricks, Jereys, Portland Cement, etc.

THE ENGINEERING AND MINING JOURNAL will thank

any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct an errors which may be found in these quotations.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, Assessments. Includes entries for Adams, Alice, Alma Cons., etc.

G. Gold, S. Silver, L. Lead, C. Copper. \* Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends, and the Terra \$75,000. ¶ Previous to the consolidation in Aug., 1884, the California had paid \$31,320,000 in dividends, and the Con. Virginia, \$24,50,000. \*\* Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1888, the Copper Queen had paid \$1,350,000 in dividends. †† 1,000,000.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stocks Quotations, listing company names, dates (July 13-19), and sales figures for both dividend-paying and non-dividend-paying mines.

\*Ex. dividend. †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment unpaid. Dividend shares sold, 7,050. Non-dividend shares sold, 23,615. Total New York, 50,665.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing company names, dates (July 12-18), and sales figures.

Boston: Dividend shares sold, 3,595. Non-dividend shares sold, 5,516. Total Boston, 9,111.

COAL STOCKS.

Table of Coal Stocks, listing company names, par values, and daily sales figures from July 13 to July 19.

\*\*Of the sales of this stock, 30,031 were in Philadelphia, and 81,935 in New York. Total sales, 111,966.

San Francisco Mining Stock Quotations.

Table of San Francisco Mining Stock Quotations, listing company names and closing quotations for July 12-18.

The Share List will close on or before Thursday, July 25. The Central Trust Company, 54 Wall street, New York, and Messrs. Glyn, Mills, Currie & Co., of London, England; the Union Bank, of Manchester, England, and Branches; and Parr's Banking Company, Liverpool, England, and Branches, are authorized to invite applications at par, for Debenture Bonds and the Preferred and Common Stock of the

## NORTH AMERICAN SALT COMPANY.

INCORPORATED UNDER THE GENERAL LAWS OF THE STATE OF NEW YORK, U. S. A.

CAPITAL STOCK, \$11,000,000, OR £2,200,000.

IN SHARES OF \$50 OR (FOR ENGLAND) £10 EACH.

Divided into 140,000 Ordinary Shares of \$50 or £10 each, and 80,000 Eight per cent Preference Shares of \$50 or £10 each.

(THE PREFERRED STOCK LIMITED TO EIGHT PER CENT PER ANNUM, DIVIDEND PAYABLE OUT OF THE PROFITS OF EACH YEAR.)

Subscriptions payable per share as follows: Ten per cent on application, thirty per cent on allotment, thirty per cent on the tenth day of August, thirty per cent on the first day of September.

If a larger amount is subscribed than is asked for, as now seems probable, the Company reserves the right to reject any excess of subscriptions, and to close the share list at any time. Many of the manufacturers selling their works to the company have requested the privilege of investing one-third or more of the purchase price in the stock of the company.

After the last payment the stock will be issued transferable in any amount of not less than \$50 or £10.

### \$4,000,000 OR £800,000 IN BONDS.

Subscriptions are also invited for \$4,000,000 or £800,000 in six per cent Debenture Bonds, in amounts of \$500 or (for England) £100 each, payable Ten per cent on application; Thirty per cent on allotment; Thirty per cent on the tenth day of August; Thirty per cent on the first day of September.

These Bonds will run for fifty years, principle and interest will be payable in gold, and be a lien upon the entire property of the company, will bear interest coupons, payable on presentation, half-yearly, on the first day of January and the first day of July, at the offices of the Central Trust Company, 54 Wall st., New York, and Messrs. Glyn, Mills, Currie & Co., 67 Lombard st., London.

**Forms of Application for Shares and Bonds** may be obtained at the office of the Central Trust Company, 54 Wall street, New York, or will be promptly mailed to any address on receipt of a telegram or letter requesting same. Should any applicant not receive an allotment, his deposit will be returned in full, and such applicants as may receive a less amount of Shares or Bonds than they apply for will have their surplus money credited to the sums due on subsequent instalments on the Shares or Bonds allotted to them. If one class of these securities is over-subscribed and another under-subscribed, those not receiving allotments in the former class will have the option of transferring their subscription to the latter class if they so desire.

**Trustees and Directors for the First Year Named in the Articles of Incorporation.**—President—Hon. Wellington R. Burt, East Saginaw, Mich., President of the Michigan Salt Association. Vice-President—Franklin Woodruff, Esq., New York Salt Merchant. Treasurer—H. K. Thurber, Esq., of Messrs. Thurber, Whyland & Co., New York, Wholesale Grocers and Salt Merchants. R. T. Wilson, Esq., Banker, New York. John Canfield, Esq., Salt Manufacturer, Manistee, Mich. William S. Conklin, Salt Manufacturer, Michigan. William A. Hazard, of Messrs. Francis D. Moulton & Co., Salt Merchants, New York. Joy Morton, Salt Merchant, Chicago, Ill. A. B. Boardman, Attorney at Law, New York. Charles F. Burger, Salt Merchant, New York. Henry W. Cannon, Banker, New York. Lord Thurlow, President English Salt Union, London. Joseph Verdin, Director English Salt Union, Winsford, Cheshire, England.

**Counselors at Law.**—Tracy, Macfarland, Boardman & Platt, New York. Exchange Geo. F. Comstock, Syracuse, N. Y. Henry Applington, Esq., New York.

The object of this Company is to unify and systematize the Salt Interests of the United States and Canada by acquiring and operating the principal works; to do away with the imperfect and wasteful methods of manufacture and distribution, to the end that manufacturers and dealers may permanently receive a fair compensation for their services, and that consumers of Salt may be furnished with a superior article at a reasonable price.

With a view to accomplish this result, arrangements have been completed for the purchase or control of nearly all the existing Salt-producing properties in the North American Continent. In order to pay outright for these properties, and to furnish an adequate capital with which to do business to the best advantage, the amount of money required is Fifteen Millions of Dollars. To provide this sum this Company has been incorporated under the laws of the State of New York with a capital stock of Eleven Millions of Dollars, divided into shares of \$50 each, and will issue Debenture Bonds to the extent of Four Millions of Dollars, in sums of \$500 each, bearing interest at 6 per cent, payable semi-annually. The stock of Eleven Millions will be divided into two classes, viz.: Four Millions of Preferred Stock, entitled to the first earnings in each year only up to 8 per cent., non-cumulative; and Seven Millions of Common Stock, entitled to all dividends declared by the Board of Trustees out of the earnings after the payment of 6 per cent. interest on the Bonds, and 8 per cent. on the Preferred Stock.

The plan here adopted of a division of securities into three classes, though somewhat novel in America, closely follow a common practice in Great Britain, where a variety of securities is found to be advantageous in suiting different classes of investors. The above proportions are similar to those of the English Salt Union, in harmony with which this enterprise is promoted, whose issues to the extent of Twenty Millions of Dollars were immediately subscribed up to an amount approaching Two Hundred Millions, and whose shares have continuously commanded a large premium ever since the allotment of the stock to the fortunate Shareholders now numbering nearly five thousand; and although in operation only about six months, a dividend at the rate of 10 per cent has just been declared, besides adding largely to the value of the property in various ways.

**THE PROPERTIES UNDER OPTION**, and to be owned and controlled by the North American Salt Company, number at the present time 130 different works and properties, the output from which furnish about seven-eighths of the total annual production of Salt on the American continent. In the great Salt producing districts of the States of New York, Ohio, West Virginia and Kansas, and Dominion of Canada, the property controlled by this Company includes nearly all the most important establishments, and with the owners of those not already secured negotiations are in progress; while in Michigan, which State produces about one-half of the total output of the United States, practically the entire Salt-producing interest has been acquired, either by direct purchase, where it is desirable, or by securing at a fixed price per barrel, the entire product, in no year to exceed the production of the past year. These latter properties, attached to large lumbering establishments, and with extensive timber areas more or less denuded, it was deemed unwise to purchase outright; but securing their output of Salt at a fixed price, and limiting their production, which will necessarily diminish from the gradual disappearance of lumber waste fuel, place this company in a position of great advantage, not only as to the control of the market naturally supplied by this important field, but as to its strategic location, the extent of its production, and the economy of its cost.

**POSSIBLE ECONOMY.**—Probably no other one of the great staples of commerce in the United States offers so favorable a field for improvements in this respect as Salt. It is an article of universal consumption, of low value, with great weight and bulk, in the production, distribution and handling of which economy is a first requisite. This economy can be secured by bringing the best talent, the best processes, and the best methods now employed in a small part of the business to bear upon the whole, or a leading part of it. A part of the American product is now as good as the best English Salt, and with the system we propose the quality of the American product as a whole can be greatly improved.

It is believed: *First*—That a liberal dividend can be realized from economies which can be effected. Instead of a great number of plants, many unfavorably situated and run only part of the time, each with its staff of officers, salesmen, office, and other expenses, encroaching on each other's territory, with ruinous prices, those most favorably situated and making the best Salt would be run to their full capacity and their product distributed in their natural territory in the most economical manner.

*Second*—That by raising the average quality, insuring uniformity by a rigid system of inspection, and representing same by suitable distinctive brands, a good-will can be established in a few years, which in itself will have a large earning power and be very valuable.

*Third*—It is not proposed to invite unnecessary competition by making high prices on our product, although a reaction from ruinous competitive prices may sometimes be experienced; but taking a period of say five years before and after the formation of this company it is confidently expected that prices will be lower during the latter period without reference to any possible competition. This Company, however, need not fear ruinous competition; the Salt fields of this country are widely separated; each has its natural market; it is arranged to own the best works in each; in the event of being attacked in one, the profits from the others would enable it to meet

any opposition successfully; and if, as has been arranged, a portion of the shares should be taken in England by those having similar interests there, even in the event of a removal of the United States import duty on Salt, it is not probable that they would desire to injure this market by making ruinous prices here, or we in turn go beyond our natural market; indeed, an understanding to this effect has already been arrived at.

Thus, without an attempt to monopolize this article, a liberal profit is assured in almost any event. It is a far more legitimate and safe investment than railroad and mining securities, which are constantly exposed to intricate rate wars and other contingencies, to say nothing of the prospect for much higher dividends. It is based on a large amount of real estate, and the most valuable and accessible deposits of one of the greatest staples of commerce, used alike by every citizen, rich or poor, in a country (including Canada) of over 70,000,000 of people, and increasing at the rate of 15,000,000 in a decade.

**CONSUMPTION OF SALT.**—It is estimated that the annual consumption of Salt in the United States and Canada, including the amount used in packing, industrial pursuits, and by cattle, is about one bushel, or fifty-six pounds per capita. The population of the United States is now estimated at sixty-five millions; that of Canada at five millions, making a total of seventy millions. Seventy millions of bushels, at five bushels to the barrel, equal fourteen millions of barrels, the amount consumed in these two countries. From this may be deducted for imported Salt and for Salt produced outside the Company's works, say, four millions of barrels, which leaves the consumption, for which this Company has already a market, ten millions of barrels.

**REVENUE.**—It is believed that with improved methods of manufacture, and the economies in distribution practicable by an organization so comprehensive as the North American Salt Company, an average net profit of at least four cents a bushel, or twenty cents a barrel, can be relied upon.

The profit on ten millions of barrels would, therefore, amount to..... \$2,000,000

It will thus be seen that there is an abundant surplus out of which to

pay the fixed charges, as follows:

Six per cent interest on Four Millions of Dollars of Bonds.....\$240,000

Eight per cent dividend on Four Millions of Dollars of Preferred Stock..... 320,000

560,000

This leaves for the Reserve Fund and dividend upon Seven Millions of

Dollars of Common Stock.....\$1,440,000

or more than twenty per cent. On the fine grades of Salt it is certain that a much larger margin of profit than that above mentioned can be obtained, and this without attempting either a corner or a monopoly.

It may seem difficult to realize such profits, yet such have hitherto been the beneficial results of co-operation in management, where the articles concerned were in universal use, that returns quite as large as the foregoing have been produced. The latest illustration of this in the United States is found in the article of sugar, in which properties valued at \$12,250,000 were combined under a capitalization estimated by some authorities to be about \$4 for every \$1, making a total issue of \$50,000,000, and the earnings of which are now sufficient to make the securities representing this large amount readily salable at prices much above par, although in the beginning they sold at only about half the present price. Nor does it follow that the excessive profit of such combinations must be based on an unreasonable advance in price and the public taxed to the extent of the excess. Although sugar has advanced in price, it is principally due to the advance of the raw material in sugar-producing countries, and not to the Sugar Refiners' Trust. The price of petroleum and all its products to-day is lower under the economical and progressive administration of the Standard Oil Company than it could be with fifty competitors handling this staple. The public are beginning to realize that two horses pulling together can accomplish results which are impossible when pulling against each other, and that captains of industry whose skill and energy realize at once a good reward for themselves and the capital of the masses entrusted to them are entitled to praise rather than prejudice and indiscriminate denunciation. Combinations, whether of labor or capital, are commendable so long as their acts are reasonable, and to combinations of capital with labor under lawful co-operative forms of organization we may reasonably look for a solution of some of the politico-economic questions of the times. Steam, electricity, machinery and capital, co-operating in production and distribution, are fast revolutionizing industrial conditions, and, as a rule, with great benefit to the public.

**NOT A TRUST.**—There is this marked difference, however, in the combination regarding Salt, as compared with similar movements in other products, viz.: That whereas, in previous combinations which took the shape of trusts, or partnerships on a large scale, only those previously deeply interested in the properties combined were permitted to participate, in the case of the North American Salt Company, in the incorporation of which the general laws of a sovereign State are made available, the public are invited, under their protection, as to capital, supervision, and otherwise, to participate, on terms of perfect equality, with the most favored, by subscribing, at par, for its securities, which are divisible into shares as low as \$50, and Bonds of \$500 each, thus becoming participants in this great industrial enterprise, which is typical of what may in the near future happen in other industries, although the number of staple articles is limited and it is believed that none possesses so many favorable conditions as Salt. If, therefore, the profit to be made by this operation is such as the foregoing figures indicate, the public have the fullest right, under the protection of the law, to participate therein; while its safety from a legal point of view is undoubted.

We would also draw the line distinctly between a legitimate manufacturing and distributing business, making liberal and permanent dividends by reason of its improved methods of business, and those illegitimate and transient forestalling operations such as we recently witnessed in grain, copper, and other staples. We can manufacture and sell ordinary grades of Salt as low as coal or sea sand is sold (if the cost of packages and transportation be deducted), and if we do this, the public will not be apt to complain if, by reason of a large organization and good management, we earn liberal dividends on the capital invested; especially as we propose to furnish salt of superior purity and quality to that commonly sold at present, and for a price which, in bulk at the works, will not amount to 20 cents for a year's supply for each person in the United States and Canada, including all that is used for packing, feeding, and manufacturing purposes. In view of the foregoing, any apprehension as to monopoly or extortion would seem to be needless and the result of a lack of information.

Some of the salt properties owned by this Company contain extensive beds of coal, which in themselves must ultimately become valuable, while their proximity to the brine renders the expense for fuel but nominal. Some of our salt fields are also within reach of natural gas, which, it is believed, can be made available for making salt; an arrangement has already been perfected with extensive natural gas interests to this end. It is certain that a union of the best talent, both in manufacturing and distribution, with sufficient capital to generally utilize the best processes and pursue the best methods, can effect economies which would be entirely beyond the reach of individual effort. In a few years the natural good will pertaining to such a business, together with the increase in population and the values of the large amount of real estate owned by the Company, must result in placing it among the very first of the magnificent industrial properties of the times.

**The Tendency of the Times.** A leading New York journalist, in discussing the increasing disposition of the public to invest in industrial securities, recently said:

"Investors are beginning to recognize the fact of the forced concentration of capital in manufacturing enterprises, just as consolidation of small lines of railroads has been forced.

"When Commodore Vanderbilt started in his railroad career, eight different companies owned eight different roads, making up the present New York Central line between Albany and Buffalo. The waste and extravagance of eight full-fledged corporations doing the work now done through a division Superintendent's office was something which was bound to be brought to an end when the right time came, and the right man was found to organize the concentration. The tendency to concentration of management in manufacturing necessitates, as an incident of it, the creation of large capital stocks, representing the many smaller which have been absorbed; and the common market for securities, that is, the Stock Exchange, is the place to which they must come. There will be fortunes made in these nearly as great as have been made in railroad securities."

This advertisement will only appear once. If subscription blanks are desired, call on, telegraph, or write the Central Trust Company, 54 Wall St., New York, and they will be promptly furnished.